

**SOUTHERN CALIFORNIA  
ACADEMY OF SCIENCES**

**118<sup>TH</sup> ANNUAL MEETING**

**April 18<sup>th</sup>, 2026**



**CHAPMAN UNIVERSITY**

# Table of Contents

ABOUT THE ACADEMY.....	2
PRESIDENT’S MESSAGE.....	4
BOARD OF DIRECTORS.....	5
STUDENT AWARDS.....	6
STUDENT GRANTS.....	7
SCAS RESEARCH TRAINING PROGRAM.....	8
Students and Their Mentors.....	9
2026 PLENARY SPEAKER.....	10
2026 ANNUAL MEETING: SCHEDULE AT A GLANCE.....	11
SCHEDULE OF TALKS.....	12
SCHEDULE OF POSTERS.....	16
Posters: Argyros Forum 209 ABC.....	16
Posters: Argyros Forum 206 ABC.....	22
ABSTRACTS IN PROGRAM ORDER.....	28



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# SOUTHERN CALIFORNIA ACADEMY OF SCIENCES

## ABOUT THE ACADEMY

The objectives of the Academy are to promote fellowship among scientists and those interested in science; to contribute to scientific literature through publication of pertinent manuscripts; to encourage and promote scholarship among young scientists; and to provide information to the membership, to the public, and to the public agencies on such matters as may be of joint interest to the sciences and society.

*ARTICLE II – OBJECTIVES in the By-Laws of the Southern California Academy of Sciences*

The Academy utilizes dues and contributions to promote student research, from high school students through the college graduate level with the following activities:

- **Research Training Program:** High school students conduct research with professional mentors and present their results at the Annual Meeting. Top presenters also attend the national conference of the American Junior Academy of Sciences held in conjunction with the American Association for the Advancement of Science.
- **Research support:** Undergraduate and graduate students receive grants to help cover their research costs.
- **Cash awards:** Undergraduate and graduate students receive awards for Best Presentation and Best poster at the Annual Meeting.

The Academy is working toward expanding its student programs by increasing the number of student participants, as well as increasing the amount of research support and cash awards. Contributions are vital in helping the Academy achieve this goal.

**The Southern California Academy of Sciences is a Federally recognized 501(c)(3) non-profit organization.**

**THANK YOU TO THIS YEAR'S SPONSORS!**

**Be sure to visit them at the booths in the poster halls.**



**Please join us next year at Pomona College in May 2027!**



Interested in hosting the annual meeting in May 2028? Please contact [president@scasnhm.org](mailto:president@scasnhm.org)



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## PRESIDENT'S MESSAGE

Friends and colleagues,

Welcome to the 2026 Annual Meeting of the Southern California Academy of Sciences at Chapman University. We are pleased to have put together a program full of presentations covering a vast array of topics including biodiversity, desert ecology, communicating science and marine ecology. Our plenary speaker this year is Tiffany Pereira from the Desert Research Institute, who will be discussing her extensive research on desert ecology and her passion for combining art and science. Following the last talks of the day, there is a poster session and reception where you can get a beverage, have some nibbles and catch up with colleagues. During this session, the students involved with the Research Training Program will also be presenting their work.

On behalf of the SCAS Board of Directors, I'd like to thank each and every one of our members for their contributions to the Academy, both monetarily and intellectually. We look forward to our annual meeting as a way to engage with other scientists at all stages of their careers, forge new collaborations and hear about all of the fascinating research happening around Southern California and beyond. I'd like to acknowledge our donor members and our partners-in-kind (The Natural History Museum of Los Angeles County, American Institute of Fishery Research Biologists and the Southern California Society of Parasitologists) for their support of SCAS and the SCAS Research Training Program.

If you have scientific papers to publish, remember that the SCAS Bulletin waives page charges for SCAS members who don't have funding to publish. The goal of the Bulletin is to report on research activities of SCAS members, scientific research conducted in Southern California, and research that is of interest to the membership.

We look forward to seeing you at future meetings! If you know anyone who might be interested in becoming a member and/or getting more involved, let one of the board members know. Thank you for your continued support of SCAS!

Mia Adreani

A handwritten signature in black ink, appearing to read "M. Adreani".

SCAS President



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## BOARD OF DIRECTORS

The academy is always seeking members who would like to become more involved in our activities by serving on our Board of Directors. The Board meets once per month to plan and direct the Society's activities, which include organizing the annual meeting, publication of the *Bulletin* and *Smilodon*, offering financial support to undergraduate and graduate students, and operating a Research Training Program for high school students. Please find a board member to express your interest in joining or email [president@scasnhm.org](mailto:president@scasnhm.org).

### **Officers**

Mia Adreani, *President*  
Richelle Tanner, *Vice President*  
Tiffany Pereira, *Corresponding Secretary*  
Edith Read, *Recording Secretary*  
Douglas Pace, *Treasurer*  
Max Murray, *Smilodon Editor*  
Daniel J. Pondella II and Bengt Allen, *Bulletin Editors*

### **Board of Directors**

**2023-2026:** Andres Carrillo, Todd Haney, Max Murray, Doug Pace  
**2024-2027:** Ann Bull, Kimo Morris, Greg Pauly, Tiffany Pereira  
**2025-2028:** Mia Adreani, Michael Carlson, Todd Clardy, Adriane Jones, Edith Read, Richelle Tanner

### **Advisory Council** (*Past Presidents*)

Ralph Appy, Brad Blood, Lisa Collins, John Roberts, Julianne Passarelli, Shelly Moore

### **Research Training Program Committee**

Kimo Morris (*Chair*), Andres Carrillo, Todd Haney, Max Murray, Greg Pauly, Tiffany Pereira

### **THANK YOU TO OUR OUTGOING BOARD MEMBERS:**

Andres Carrillo



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## STUDENT AWARDS

Graduate, undergraduate, and high school students who elect to participate are eligible for Best Oral Presentation or Best Poster awards. The Southern California Junior Academy of Sciences (SCJAS) will also present awards.

The **M. James Allen SCAS Award** was established to recognize students who best exemplify the skills required to prepare and deliver an oral presentation at the SCAS Annual Meeting. This award is named in honor of Dr. Jim Allen, a local expert in fish ecology, mentor to many, and long-time SCAS Board member. Dr. Allen always supported students, through his participation in SCAS, AIFRB, as well as his service on many Master's and Ph.D. student thesis committees. He was an expert on Southern California trawl-caught fishes and was lead scientist on the Southern California Regional Bight Survey Fish and Invertebrate Committee. Known as a "walking encyclopedia of fishes," his extensive publication record and willingness to give guest lectures for his many colleagues at local universities will never be forgotten.

### **2025 STUDENT AWARD WINNERS**

#### **BEST ORAL PRESENTATIONS, *M. James Allen Award:***

- **Olivia Knapp**, Westmont College: Acorn woodpeckers alter resource use and group composition across an urban landscape with implication for productivity

#### Honorable mention:

- **Emily Fitzpatrick**: Demographic structure of tecate cypress (*Hesperocyparis forbesii*) in the northern santa ana mountains: viability in the face of fire
- **Eli Taub**: Abundance-based systematic conservation planning of north american birds using macroecological principles
- **Newton Hood**: From a full gut to a full gonad; using GnRH to examine the link between reproductive and nutritional physiology in red and white abalone
- **Wilson Sherman**: The wildlife nextdoor: socioeconomics and race predict social media carnivore reports

#### **BEST POSTER PRESENTATION:**

- **Analisa Vavoso**, Chapman University: Climate change distress among environmental practitioners
- **Kyle Suen**, UC Irvine: Recipient community structure mitigates the impacts of a range-shifting predator
- **Oscar Roering**, Pomona College: Assessing differences in water use efficiency across 11 species of street oaks in Claremont, CA

#### Honorable Mention:

- **Denver Dingle**, CSU Fullerton: Desert shrub responses to irrigation in channels versus inter-channel surfaces using water potential and stable isotope analyses



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## STUDENT GRANTS

The Southern California Academy of Sciences provides research grants to graduate and undergraduate students. The winners are required to present their research at the following year's Annual Meeting and provide an article for the SCAS Newsletter *Smilodon*.

### 2026 GRANT AWARDS

**To be announced at the President's Address!**

### 2025 GRANT AWARDS

- **Claribel Alcantar, California State University, Long Beach:** Effects of recent thermal history and food ration on the physiological response of *Mytilus californianus* to subsequent high temperature stress
- **Emma Dudley, Chapman University:** Stretching their restoration range to the limit: physiological and genetic responses in a reciprocal acclimation of Southern California and Puget Sound *Phyllaplysia taylori* sea hares
- **Eva Greco, California State University, Northridge:** Hot lizards on cool islands: characterizing the thermal biology of an insular endemic
- **Jade Zounes, California State University, Northridge:** The role of Opaleye (*Girella nigricans*) in giant kelp (*Macrosystis pyrifera*) dispersal



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## SCAS RESEARCH TRAINING PROGRAM

### Acknowledgements

#### **SCAS RTP Committee Members**

- Kimo Morris (*Chair*) – Santa Ana College
- Andres Carrillo – Cypress College
- Todd Haney – Sage Hill School
- Max Murray – Dudek
- Greg Pauly – Natural History Museum of Los Angeles County

#### **Guest Presenters: Meeting I, September 20, 2025**

*Online via Zoom*

- Andres Carrillo, Cypress College
- Todd Haney, Sage Hill School
- Kimo Morris, Santa Ana College

#### **Guest Presenters: Meeting II, November 22, 2025**

*Cabrillo Marine Aquarium*

- Andres Carrillo, Cypress College
- Todd Haney, Sage Hill School
- Kimo Morris, Santa Ana College
- Julianne Passarelli, Cabrillo Marine Aquarium
- Danny Tang, Orange County Sanitation District

#### **Guest Presenters: Meeting III, March 14, 2026**

*University of Southern California and Natural History Museum of Los Angeles County*

- Andres Carrillo, Cypress College
- Will Farris, Natural History Museum of Los Angeles County
- Juliana Granados, Natural History Museum of Los Angeles County, USC
- Hamid Djalilian, University of California Irvine
- Todd Haney, Sage Hill School
- Ethan Kahn, Natural History Museum of Los Angeles County
- Dean Pentcheff, Natural History Museum of Los Angeles County
- Chloe Saldana, Natural History Museum of Los Angeles County, CSULA
- Shelby Yarbough, Natural History Museum of Los Angeles County, CSULA
- Regina Wetzer, Natural History Museum of Los Angeles County



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## SCAS RESEARCH TRAINING PROGRAM

### Students and Their Mentors

- Ayushi Agarwal, Oak Park High School - Lea Harris, JPL
- Shravya Bharathwaj, Westview High School – Emmet Francis, UCSD
- Katie Chang, Sage Hill School – Dierdre Gormley, Beauty Care
- Cooper Chen, Tarbut V’Torah Community Day School – Nancy Caruso, Get Inspired, Inc.
- Cordelia Cieplucha, Sage Hill School – Vipal Soni, Orange County Dermatology and Surgery
- Ananya Devkirti, Sage Hill School – Shahrddad Lotfipour, UCI
- Leroy Hui, Trabuco Hills High School
- Mischa Kreidler, Sage Hill School – Todd Haney, Sage Hill School
- Alexander Lee, The Webb Schools – Kyle Yeh, Brown University
- Maxwell Lee, Sage Hill School – Sandra Holly, UCLA School of Medicine
- Melissa Lee, The Webb School – Kyle Yeh, Brown University
- Jaelyn Liang, Westview High School – Andrew Blumberg, Columbia University
- Justin Liu, Sage Hill School – Qi-Long Ying, USC
- Karen Martinez, North Hollywood High School Highly Gifted Magnet – Ruslan Rust, USC
- Jason Park, Stratford Preparatory High School – Jeongwoo Ko, Google
- Darren Phan, Milpitas High School
- Aanya Pillai, Sage Hill School – Fara Aidul, Alzheimer’s Association
- Julia Shin, Oxford Academy – Matteo Pellegrini, UCLA School of Medicine
- Madison Stark, Crean Lutheran High School – Andrew Bullock, University of Notre Dame Harper Cancer Research Institute
- Vera Yang, Sage Hill School – Donald Wilson, NYU Grossman School of Medicine



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## 2026 PLENARY SPEAKER



**Tiffany Pereira**

ASSOCIATE RESEARCH SCIENTIST, ECOLOGIST  
DESERT RESEARCH INSTITUTE

### *THE ART OF SCIENCE*

#### **ABSTRACT:**

Science and art do not exist on separate planes polarized by different processes. Art can powerfully convey scientific principles. As art reflects culture, scientific illustration reflects the findings of science and technology, taking the viewer to the often unobservable. Science, research, and exploration is also inherently a creative process. Both disciplines require one thing...curiosity. Join Desert Research Institute Associate Research Scientist and Scientific Illustrator, Tiffany Pereira on an exploration of both subjects and the unique ways they can blend together. Learn how she incorporates artistic principles into her research in Nevada, California, and the Desert Southwest.

#### **BIOGRAPHY:**

**Tiffany Pereira** is an ecologist and scientific illustrator specializing in the flora and fauna of the desert southwest. After growing up in Southern California, spending countless days on the Channel Islands, she now calls the Mojave Desert of Southern Nevada home. Her research focuses on flora and fauna interactions, germination ecology, rare plant ecology, soil seed banks, and restoration ecology. Her research has been published in peer reviewed journals and featured on NPR, The Las Vegas Review Journal, and more. As both a researcher and artist, she is also interested in graphic design and illustration for science communication and education. Her illustrations and paintings are featured in numerous publications including the Nevada State Museum's Permanent Exhibit. She is also a SCAS board member and is proud to continue serving the Southern California science community!



## 2026 ANNUAL MEETING: SCHEDULE AT A GLANCE

<b>SATURDAY April 18, 2026</b>				
<b>TIME</b>	<b>ARGYROS FORUM 202</b>	<b>ARGYROS FORUM 207</b>	<b>ARGYROS FORUM 208</b>	<b>ARGYROS FORUM 211</b>
8:30 - 9:30	Urban Biodiversity Symposium	Contributed A	Ocean Science Institute Symposium	Science Communication
9:30 - 9:45	<b>Break</b>			
9:45 - 11:00	Urban Biodiversity Symposium	Contributed B	Ocean Science Institute Symposium	Science Communication
11:00 - 11:10	<b>Break</b>			
11:10 - 12:40	President's Address & Plenary Plenary Speaker: <b>Tiffany Pereira</b> <i>The Art of Science</i> <b>Hashinger Science Center 150</b>			
1:00 - 2:15	<b>Lunch</b>			
<b>ARGYROS FORUM 202</b>	<b>ARGYROS FORUM 207</b>	<b>ARGYROS FORUM 208</b>	<b>ARGYROS FORUM 211</b>	<b>ARGYROS FORUM 211</b>
2:15 - 3:15	Community Engaged Research	RESCUE-Net	Contributed C	Contributed E
3:15 - 3:30	<b>Break</b>			
3:30 - 4:30	Community Engaged Research	RESCUE-Net	Contributed D	Contributed F
4:30 - 5:00	<b>Break</b>			
5:00 - 7:00	Poster Session <b>ARGYROS FORUM 209 ABC</b> & <b>ARGYROS FORUM 206 ABC</b>			



## SCHEDULE OF TALKS

<b>SYMPOSIA and CONTRIBUTED 8:30 – 9:30</b>				
Time	<b>Argyros Forum 202</b> <i>Urban Biodiversity</i> <b>Chair: Greg Pauly</b> Natural History Museum of Los Angeles County	<b>Argyros Forum 207</b> <i>Contributed A</i> <b>Chair: Todd Haney</b> Sage Hill School	<b>Argyros Forum 208</b> <i>Ocean Science Institute</i> <b>Chair: Dan Pondella</b> Occidental College	<b>Argyros Forum 211</b> <i>Science Communication</i> <b>Chair: Todd Clardy</b> Natural History Museum of Los Angeles County
8:30 - 8:45	--	--	<b>31. Larry G. Allen</b> SPAWNING TIME OF GIANT SEA BASS	--
8:45 - 9:00		<b>15. Lila Le</b> TISSUE INTERNALIZATION IN TURTLE GASTRULAE	<b>32. Darren Johnson</b> EVOLUTION OF LARVAL FISH IN A WARMING OCEAN	--
9:00 - 9:15	<b>1. Jann Vendetti</b> CRYPTIC CITY SNAILS: TWO SPECIES OF INTRODUCED FLATCOIL SNAILS (POLYGYRA) IN SOUTHERN CALIFORNIA	<b>16. Sofia Carranza</b> HATCH ORDER AND DIET IN GREAT BLACK-BACKED GULLS	<b>33. Rachel Le</b> POPULATION ECOLOGY OF UNDARIA IN DANA POINT HARBOR	<b>48. Todd R. Clardy</b> TWITCH AS A PLATFORM FOR SCIENCE COMMUNICATION
9:15 - 9:30	<b>2. Gregory B. Pauly</b> YARROW'S SPINY LIZARDS AND OTHER POTENTIAL INTENTIONAL HERPETOFAUNAL RELEASES IN SOUTHERN CALIFORNIA	<b>17. Noopur Barve</b> DNA METABARCODING OF GREAT BLACK-BACKED GULL DIET	<b>34. Sandra C. Dansereau</b> HUMAN TRAMPLING IMPACTS ON TWO SEA ANEMONE SPECIES	<b>49. Stephanie Abramowicz</b> ILLUSTRATING THE DIG: VISUAL METHODS FOR DOCUMENTATION AND COMMUNICATION (BEFORE, DURING, AND AFTER)

**SYMPOSIA and CONTRIBUTED 9:45 – 11:00**

Time	Argyros Forum 202 <i>Urban Biodiversity</i>  <b>Chair: Greg Pauly</b> Natural History Museum of Los Angeles County	Argyros Forum 207 <i>Contributed B</i>  <b>Chair: Todd Haney</b> Sage Hill School	Argyros Forum 208 <i>Ocean Science Institute</i>  <b>Chair: Dan Pondella</b> Occidental College	Argyros Forum 211 <i>Science Communication</i>  <b>Chair: Todd Clardy</b> Natural History Museum of Los Angeles County
9:45 - 10:00	<b>4. Dayun Suh</b> ECOMORPHOLOGICAL RESPONSE OF SOUTHERN CALIFORNIA BOBCATS TO DUAL FILTERS OF ANTHROPOGENIC SELECTION	<b>18. Sasha Sypher</b> ESTUARINE CRAB LOADED WITH DIVERSE PARASITES	<b>35. Natalie Shubin</b> HOW STUDYING LARVAL FISH CAN IMPROVE FOOD SECURITY	<b>50. Christine Wilkinson</b> CO-CREATION AND COMMUNICATION IN CONSERVATION
10:00 - 10:15	<b>5. Miguel Ordeñana</b> THE NHMLAC BAT ROOST COUNT: REMOVING BARRIERS TO PARTICIPATION IN SCIENCE WHILE STUDYING URBAN BATS.	<b>19. Angela C. Ho</b> A NOVEL SEA ANEMONE HOST FOR THE SYMBIOTIC AMPHIPOD ORCHOMENELLA RECONDITA	<b>36. Alec J. Lamond</b> RESILIENT RESTORATION: TEMPORAL GENETIC STABILITY OF ZOSTERA MARINA	<b>51. Phillip Sternes</b> SEA THE WORLD: PRESENTING SCIENCE AT SEAWORLD
10:15 - 10:30	<b>6. Marlene Walters</b> URBAN DARK-EYED JUNCOS ESTABLISH A LOWER AGGRESSION BASELINE FOLLOWING THE PANDEMIC LOCKDOWN	<b>20. Rhowan Ho</b> PARASITIC FLATWORMS WITH SOLDIERS – DEVELOPMENT AND AGING IN THE REPRODUCTIVE SOCIAL CASTE	<b>37. Ryan P. Walter</b> FINE- SCALE GENETIC STRUCTURE AND DISPERSAL IN ZOSTERA MARINA	<b>52. Moses Aubrey</b> TELLING YOUR CONSERVATION OR COMMUNITY SCIENCE STORY WITH LIMITED RESOURCES USING SCI-COMM
10:30 - 10:45	<b>7. Joseph N. Curti</b> ASSESSING SPATIAL AND ALTITUDINAL VARIATION IN ARTIFICIAL LIGHT AT NIGHT ACROSS URBAN LOS ANGELES	<b>21. C. G. Rizzuti</b> FOOD-WEB EXPLOITING PARASITES DOMINATE PARASITIC LOAD AND DIVERSITY IN JACKKNIFE CLAMS	<b>38. Joseph Heras</b> SNACKS FOR PRICKLEBACKS: GENOMES TO MICROBIOMES	<b>53. Lila Seidman</b> HOW TO SHARE YOUR WORK: TIPS FROM A REPORTER
10:45 - 11:00	<b>8. Brenton Spies</b> ASHES TO RECOVERY: WILDFIRE-RESPONSIV E MANAGEMENT OF THE ENDANGERED TIDEWATER GOBY	<b>22. Juliana Granados</b> HIDDEN IN PLAIN SIGHT: UNVEILING A NEWLY DOCUMENTED PARASITIC ISOPOD IN ZEBRA PERCH	<b>39. Jade A. Zounes</b> EFFECTS OF FOOD AVAILABILITY ON THE DIET OF A FISH	<b>54.</b> ROUND TABLE / PANEL DISCUSSION

<b>SYMPOSIA and CONTRIBUTED 14:15 – 16:30</b>				
Time	<b>Argyros Forum 202</b>	<b>Argyros Forum 207</b>	<b>Argyros Forum 208</b>	<b>Argyros Forum 211</b>
	<i>Community-Engaged Research</i> <b>Chair: Richelle Tanner</b> Chapman University	<i>RESCUE-Net</i> <b>Chair: Wallace M. Meyer</b> Pomona College	<i>Contributed C</i> <b>Chair: Amanda Frazier</b> Chapman University	<i>Contributed E</i> <b>Chair: Mia Adreani</b>
14:15 - 14:30	--	<b>23. Wallace Meyer</b> Research Experiences in Southern California for Undergraduate Ecologists Network (RESCUE-Net)	<b>40. Mark H. Capelli</b> SOUTHERN CALIFORNIA BAR-BUILT ESTUARIES	<b>55. Alexandria Pivovarov</b> GOT WATER? COMBINED EFFECTS OF HEAT AND DROUGHT ON COASTAL SAGE SCRUB SPECIES SALVIA LEUCOPHYLLA
14:30 - 14:45	<b>9. Amalia Almada</b> CENTERING COMMUNITIES: USC SEA GRANT'S APPROACH	<b>24. Ava Santos-Volpe</b> C AND N STABLE ISOTOPE RATIOS IN NATIVE PLANTS	<b>41. Emma Dudley</b> LEAF IT TO THE SEAHARES: HOW EELGRASS SHAPES GROWTH REGULATION IN PHYLLAPLYSIA TAYLORI	<b>56. Eva E. Greco</b> COOL ISLANDS, HOT LIZARDS: CHARACTERIZING THE THERMAL BIOLOGY OF AN INSULAR LIZARD
14:45 - 15:00	<b>10. Jessica Barlow</b> MULTIGENERATIONAL ENGAGEMENT IN BROWNFIELDS REUSE	<b>25. Erica L. Strozier</b> ARE MTN MAHOGANY LEAVES SIMILAR FROM 700–1800 M?	<b>42. Nancy Caruso</b> BORROWING WILD BROODSTOCK TO RESTORE GREEN ABALONE	<b>57. Alex A. Mendelson</b> EVOLUTIONARY EFFECTS OF CLIMATE ON COMPETITION
15:00 - 15:15	<b>11. Raphael Mazor</b> DEVELOPING AN ASSESSMENT FRAMEWORK FOR NATURE-BASED RECREATION, AN OVERLOOKED ECOSYSTEM SERVICE IN URBAN SETTINGS THAT DEPENDS ON ECOLOGICAL HEALTH	<b>26. Stella Raymond</b> URBAN OASES: MICROHABITAT ALTERS HYDRIC PHYSIOLOGY	<b>43. Sara Fangton</b> USING DETECTION DOGS TO MONITOR FOR PISMO CLAMS	<b>58. Janine N. Straughan</b> COMPETITION DRIVES SPATIAL SEGREGATION BETWEEN TWO THREATENED RODENT SPECIES

<b>SYMPOSIA and CONTRIBUTED 15:30 – 16:30</b>				
Time	<b>Argyros Forum 202</b>	<b>Argyros Forum 207</b>	<b>Argyros Forum 208</b>	<b>Argyros Forum 211</b>
	<b>Community-Engaged Research</b> <b>Chair: Richelle Tanner</b> Chapman University	<b>RESCUE-Net</b> <b>Chair: Wallace M. Meyer</b> Pomona College	<b>Contributed D</b> <b>Chair: Amanda Frazier</b> Chapman University	<b>Contributed F</b> <b>Chair: Mia Adreani</b>
15:30 - 15:45	<b>12. Richelle Tanner</b> SUPPORTING A RESIDENTS' ADVOCACY COALITION FOR COMMUNITY-LED ENVIRONMENTAL RESEARCH DEVELOPMENT	<b>27. Valerie Wang</b> COMPARING CARBON-FLUX ACROSS URBAN AND NATURAL LANDSCAPING SCHEMES	<b>44. Kylie Rios</b> USING BIOLOGGING TAGS AND HIDDEN MARKOV MODELS TO ANALYZE JUVENILE WHITE SHARK BEHAVIORAL STATES	<b>59. James Heiser</b> LINED SHORE CRABS OF AMERICAN MARSHES AND ROCKY SHORES: ONE SPECIES DIVERGED FROM THOSE IN ASIA ~1MA
15:45 - 16:00	<b>13. Sara O'Connor</b> LIVING WITH RECURRING FIRE: BUILDING ADAPTIVE CAPACITY THROUGH GRASSROOTS FIRE RESPONSE	<b>28. Cassandra Jordan</b> GENETIC POPULATION STRUCTURE AND PHYLOGENETIC RELATIONSHIPS OF BANANA SLUGS(ARIOLIMAX SPP.).	<b>45. Emily Aghajani</b> REPRODUCTIVE RESPONSES TO UNPREDICTABLE HEAT EXTREMES ACROSS THE RANGE OF PHYLLAPLYSIA TAYLORI	<b>60. William Farris</b> CONTINENT SURFING: THE FIRST MOLECULAR PHYLOGENY OF A GONDWANAN ISOPOD SUBORDER
16:00 - 16:15	<b>14.</b> ROUND TABLE / PANEL DISCUSSION	<b>29. Anna Bowen</b> ROLE OF URBAN STREET BUFFERS ON THE DELIVERY OF KEY ECOSYSTEM SERVICES	<b>46. Claribel Y. Alcantar</b> HEAT AND FOOD STRESS AFFECTS MUSSEL BIOCHEMISTRY	<b>61. Aiko Abo Dominguez</b> A NEW SPECIES OF LIGIA (CRUSTACEA: ISOPODA) IN LOS ANGELES HARBOR BASED ON MOLECULAR DATA
16:15 - 16:30	ROUND TABLE / PANEL DISCUSSION	<b>30.</b> ROUND TABLE / PANEL DISCUSSION	<b>47. Alexis Coddig</b> PREDICTING POPULATION-LEVEL CONSEQUENCES OF THERMAL STRESS WITH INTEGRAL PROJECTION MODELS (IPMS)	<b>62. Ethan Kahn</b> RNA STRUCTURE APPROACH TO THE SPHAEROMATID TREE
17:00 - 19:00	<b>POSTER SESSION</b>  Argyros Forum 209 ABC & Argyros Forum 206 ABC			



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## SCHEDULE OF POSTERS

### Posters: Argyros Forum 209 ABC

63. -

64. **Melissa S. Lee**, The Webb Schools

MEASURING FALL RISK USING THE INTERNET-OF- THINGS FOOTBOARD

65. **Mischa Kreidler**, Sage Hill School

INFLUENCE OF PH ON SHELL REGENERATION IN A MARINE BIVALVE

66. **Leroy Hui**, Trabuco Hills School

TBD

67. **Mackenzie Schilling**, Department of Geography, Geology, and Environment, California State University Los Angeles

STUDY OF THE SALT CREEK WETLAND AT THE SALTON SEA

68. **Jose Garcia**, Hydrogeology Program, California State University - Los Angeles

ISOTOPIC TRACING OF SULFATE IN THE LA RIVER

69. **Vincent Cannizzaro**

EFFECTS OF CLIMATE CHANGE ON ROTIFER COMPETITION

70. **Kalani Wagoner**, ESRM, CSUCI

MICROPLASTICS IN ISLAND TERRESTRIAL MAMMALS (UROCYON LITTORALIS SANTACRUZAE)

71. **Quinlynn McCarthy**, Marine Sciences Department, Orange Coast College

CORRELATION BETWEEN TIDAL STATE AND BEHAVIOR OF BOTTLENOSE DOLPHINS

72. **Parker Evans**

PLANT REMEDIATION FOR RESIDENTIAL SOIL AFFECTED BY FIRE AND HEAVY METAL POLLUTION

73. **Elizabeth M. Garcia**

SEED LIMITATION OF PINUS PONDEROSA AND P. JEFFREYI

74. **Brooklyn Burch**

A LABORATORY-BASED APPROACH TO ASCERTAIN THREATENED HAWAIIAN ARBOREAL SNAILS' PLANT PREFERENCES

75. **Jessica Valenzuela**, Environmental Science Department, California State University-Los Angeles

HYDROCHEMICAL TRACERS REVEAL GROUNDWATER LOADING IN THE CHANNELIZED ARROYO SECO, SOUTHERN CALIFORNIA

76. **Brianna Chau**

ENVIRONMENTAL DNA AS A TOOL FOR MONITORING STICHAEIDE AND PHOLIDAE DIVERSITY

77. **G. Olivia Plumb**, Biology Department, Occidental College

EARLY PATTERNS OF SEEDLING RECOVERY FOLLOWING WILDFIRE IN THREE NATIVE CALIFORNIA PLANTS

78. **Mackenzie Bravo Woo**, Department of Biology, Pomona College

THE RELATIONSHIP BETWEEN ALGAE COVER AND ANEMONE ABUNDANCE IN THE INTERTIDAL ZONE

79. **Alexander W. Lee**, The Webb Schools

HANDGRIP STRENGTH OF PATIENTS IN PAIN MANAGEMENT

80. **Priscilla Tso**, Biological Sciences Department, Mount Saint Marys' University Los Angeles

MULTIDRUG RESISTANCE IN THE URBAN WATERSHEDS OF LOS ANGELES

81. **Sal Gutierrez**, Biological Sciences Department, Cal Poly Pomona  
THE ROLE OF SURFGRASS(PHYLLOSPADIX TORREYI)AND SAND MOVEMENT IN  
SOUTHERN CALIFORNIA ROCKY INTERTIDAL
82. **Micah Kim**, Environmental Science & Policy Department, Chapman University  
ENVIRONMENTAL EFFECTS ON COASTAL HOUSING VIA REMOTE SENSING
83. **Aanya Pillai**, Sage Hill School  
EVALUATING THE IMPACT OF ART THERAPY ON COGNITIVE FUNCTION IN AGING  
POPULATIONS
84. **Alex Peirce**, Geography Department, California State University- Long Beach  
SPATIAL JUSTICE NEAR THE DIESEL DEATH ZONE
85. **Gia Rizvi**, Biology, Loyola Marymount University, grizvi@lion.lmu.edu  
SEX BASED SIZE DIFFERENCES IN LARUS MARINUS CHICKS
86. **Matisse McKenna**, Biology Department, Loyola Marymount University  
PARENTAL PROVISIONING SHIFTS IN GULL CHICKS
87. **Julianna Colucci**, Biological Sciences Department, California State University Fullerton  
BIOEROSION PATTERNS IN OLYMPIA OYSTERS
88. **Kate Selfe**, Concentration in Life Sciences, Soka University of America  
PHOTOSYNTHETIC PERFORMANCE OF ROCKWEED, SILVETIA COMPRESSA
89. **Juancarlo Jimenez Gutierrez**, Department of Biological Science, California State University  
Fullerton  
AGGREGATION DYNAMICS IN ANTHOPLEURA ELEGANTISS
90. **Citlalli Vergara**, Ecology and Evolutionary Biology Department, University of California Irvine  
DRIVERS OF URBAN SOIL MICROBIAL COMMUNITY COMPOSITION

91. **Malee Bedolla**, Biology Department, Loyola Marymount University  
VISUALIZING THE COLONIZATION PATHWAYS OF NON-RHIZOBIAL BACILLUS SIMPLEX  
IM ROOT NODULES
92. **Ebby Slater**, Biology Department, University of La Verne  
WATER USE BY BIRDS IN THE CHAPARRAL DURING SEVERE AND EXTREME DROUGHT  
PERIODS
93. **Mariam Tadevosyan**, Biological Sciences Department, Loyola Marymount University  
COASTAL CONSTRUCTION AND CARBON STORAGE: COMPARING SEDIMENT STORED  
CO<sub>2</sub> ACROSS DEVELOPMENT STAGES
94. **Harrison Porter**, Department of Biological Science, CSUF  
GROUND-DWELLING ARTHROPOD ABUNDANCE AFTER MAJOR WILDFIRES IN  
CALIFORNIA
95. **Emma Perez**, Marine Biodiversity Center, Natural History Museum of Los Angeles County  
MY TYPE OF SLIDES
96. **Julia Shin**, Oxford Academy  
CROSS-SPECIES MODELING OF EPOGENETIC AGING IN THREE PRIMATES
97. **Jaelyn Liang**, Westview High School  
A FPGA-BASED NEUROMORPHIC-DEEP LEARNING FUSION ARCHITECTURE FOR  
ENERGY EFFICIENT AI APPLICATIONS
98. **Analisa Vavoso**, Psychology Department, Chapman University  
PRO-ENVIRONMENTAL BEHAVIOR AMONG AMERICANS
99. **Paola Lopez de Cardenas**, Biological Sciences Department, Loyola Marymount University  
IS AGE JUST A NUMBER? AN ANALYSIS OF TAPHONOMY IN OLDER DEPOSITS AT THE  
RANCHO LA BREA TAR PITS
100. **Claremont Worley**, Department of Biological Sciences, California State University, Long Beach  
ESTIMATED COST OF DEVELOPMENT FOR THE EMBRYONIC STAGE OF THE  
CALIFORNIA GRUNION

101. **Jenna Marie Cruz Aquino**, Department of Ichthyology, Natural History Museum of Los Angeles County

MICROPLASTICS IN SOUTHERN CALIFORNIA FISH

102. **Kira Miller**, Department of Biological Sciences, California State University, Long Beach

EFFECTS OF PREDATION ON THE DEVELOPMENT OF HARD-SUBSTRATE INVERTEBRATE ASSEMBLAGES

103. **Ava Santos-Volpe**, Dept. of Biology, Pomona College

THE IMPACT OF ROCKWEED ON INTERTIDAL SPECIES DIVERSITY

104. **Kara Stella**, Department of Biology, California State University Northridge

DOES KELP ABUNDANCE AND PERSISTENCE INFLUENCE FISH TROPHIC RELATIONSHIPS AND COMMUNITY COMPOSITION?

105. **Bengt Allen**, Department of Biological Sciences, California State University, Long Beach

EXPLORATORY ANALYSIS OF 20+ YEARS OF KELP FOREST COMMUNITY STRUCTURE DATA FROM THE SBC LTER PROGRAM

106. **Cloe Christensen**

ASSESSMENT OF FISH COMMUNITY CORRELATES IN A SOUTHERN CALIFORNIA SALT MARSH

107. **Fernando Gutierrez**, Biological Sciences Department, California State University Long Beach

CORRELATIONS BETWEEN INLET STATUS, OPENING FREQUENCY, AND FISH COMMUNITIES WITHIN ESTUARIES

108. **Reagan Bean**, Moore Laboratory of Zoology, Department of Biology, Occidental College

PLANT PREFERENCES OF INTRODUCED RED-CROWNED AMAZONS IN SOUTHERN CALIFORNIA

109. **Shiori Terretta**, Department of Natural Sciences, Pitzer College

PLASTIC INGESTION OF TRANSLOCATED BLACK-FOOTED ALBATROSS CHICKS

110. **Darren Phan**, Milpitas High School

SCAFFOLD-AWARE DRUG POTENCY PREDICTION: COMPARATIVE EVALUATION OF TRANSFORMER ARCHITECTURES AND STACKED ENSEMBLE METHODS FOR LDHA PIC50 PREDICTION

111. **Lilyana Contreras**, Marine Biology Department, California State University Long Beach

PROTECTION WITHOUT PREFERENCE: GREEN SEA TURTLE HABITAT USE AND ALGAL ASSOCIATIONS AROUND CATALINA

112. **Jackeline Godinez Gonzales**, Environmental Studies Department, University of Southern California

SUNKISSED SOLUTIONS : HARNESSING SUNFLOWERS FOR PRACTICAL NICKEL EXTRACTION AND SOIL RESTORATION

113. **Mia Ceja**, Department of Biological Science, California State University, Fullerton

DO ROSE LEAF TRAITS PREDICT DROUGHT PERFORMANCE?

114. **Ananya Devkirti**, Sage Hill School

ENHANCED FENTANYL SELF-ADMINISTRATION FOLLOWING NICOTINE EXPOSURE IN A RODENT MODEL

## Posters: Argyros Forum 206 ABC

115. **Vera Yang**, Sage Hill School

INVESTIGATING CROSS MODAL RELATIONSHIPS IN PATTERN DISCRIMINATION

116. **Maeve Secor**, University of Southern California, Molecular Biology Department and Natural History Museum of Los Angeles County, Ornithology

THE EFFECT OF FEATHER MICRO- AND NANO-STRUCTURE ON PLUMAGE SEXUAL DICHROMATISM IN TANGARA TANAGERS

117. **Marty Valdez**, Vantuna Research Group, Occidental College

HOW STUDYING LARVAL FISH CAN IMPROVE FOOD SECURITY IN OUR URBAN OCEAN

118. **Mariana Antonio**

FROM GENES TO STREAMS: MITOCHONDRIAL APPROACHES TO POPULATION MONITORING OF THE SANTA ANA SUCKER

119. **Sophia Badillo**, Department of Biological Sciences, California State University San Marcos

GENETIC ASSIGNMENT OF UNKNOWN AND MISIDENTIFIED BANANA SLUG SAMPLES USING GENOMIC DATA

120. **Kyle D. Osornia**, Biological Sciences Department, California State Polytechnic University, Pomona

LEVERAGING PLANT TRAITS FOR HEDGEROW SPECIES SELECTION IN SOUTHERN CALIFORNIA AGRICULTURE

121. **William Haddock**, Environmental Science and Resource Management, California State University of Channel Islands.

ROADRUNNER AND GARDEN SNAIL DENSITY RELATIONSHIPS IN SANTA MONICA MOUNTAINS

122. **Ryan Prem**, Environmental Science and Resource Management Program, CSU Channel Islands

POLLINATOR OBSERVATION DISPARITY BETWEEN INATURALIST AND FIELD RECORDING

123. **Cooper Chen**, Tarbut V' Torah Community Day School

EFFECT OF VENTRAL SUPPORT ON SUB-LEGAL TIVELA STULTORUM IN  
SEDIMENT-FREE AQUACULTURE SYSTEMS

124. **Madison Stark**, Crean Lutheran High School

DNA DAMAGE RESPONSE AND CHROMATIN REMODELING MUTATION ANALYSIS IN  
PANAMANIAN BREAST CANCER PATIENTS

125. **Katie Chang**, Sage Hill School

GLOBALIZING SUNSCREEN: IDENTIFYING VIABLE GLOBAL UV FILTERS THROUGH  
COMPARATIVE REGULATORY ANALYSIS

126. **Maxwell Lee**, Sage Hill School

CELL-TYPE-SPECIFIC INTEGRIN/CSPG EXPRESSION AS A PREDICTOR OF SPINAL CORD  
INJURY RECOVERY

127. **Cordelia Cieplucha**, Sage Hill School

RESTORING MICROBIAL BALANCE IN ACNE THROUGH TARGETED BACTERIOPHAGE  
THERAPY

128. **Alexandra M. Whitcomb**, Department of Biology, Frank R. Seaver College of Science and  
Engineering, Loyola Marymount University

ISOLATION, CLONING, & CHARACTERIZATION OF A DNF2 REGULATORY GENE  
HOMOLOG IN MELILOTUS ALBA

129. **Otto Martinez**, Department of Biological Science, California State University, Fullerton

DOES TIDAL ELEVATION INFLUENCE INTERACTIONS BETWEEN NATIVE AND  
NONNATIVE OYSTER SPECIES?

130. **Wallace B. Leatham**, Dept. Geological Sciences, CSU San Bernardino, CA 92407

SUPER-DARK MUDS, INTRASTRATAL MICROBES, & GENESIS OF EXOTIC "EVAPORITES",  
PALEO-SEARLES LAKE, CA

131. **Brayden C Ortiz**, California State University Long Beach Shark Lab, California State University  
Long Beach

STAYING OR PASSING THROUGH? SPATIAL STRATEGIES OF BAT RAYS IN A WHITE  
SHARK NURSERY

132. -

133. **Shravya Bharathwaj**, Westview High School

ASTROCYTE-SYNAPSE PROXIMITY REGULATES GLUTAMATE UPTAKE

134. **Mary Torosyan**, Department of Biological Sciences, Glendale Community College

MITOCHONDRIAL DNA-BASED PHYLOGENY AND RADULAR MORPHOLOGY OF BANANA SLUGS (ARIOLIMAX SPP.)

135. **Loretta Lulu Deranja**, Department of Biological Sciences, Glendale Community College

MORPHOLOGY MAGNIFIED: POLLEN FROM THE NATURAL HISTORY MUSEUM OF LOS ANGELES COUNTY'S NATURE GARDENS

136. **Wyatt Weaver**, Department of Biological Sciences, California State University, Long Beach

HORIZONTAL RATE OF MOVEMENT AND ALLOMETRIC SCALING IN JUVENILE WHITE SHARKS AT PADARO BEACH

137. **Jason Park**, High School Student, Stratford Preparatory Blackford High

PHYTOLENS: AI-POWERED PLANT DISEASE DETECTION USING LLMS AND SMART GLASSES

138. **Milan Coleman**, Biology Department, Occidental College

COMPARING DROUGHT TOLERANCE OF ARUNDO, MULE FAT, AND WILLOW IN A GROUNDWATER DEPENDENT ECOSYSTEM

139. **Elliott Brammer**, Biological Sciences Department, California State University Long Beach

RESTORATION TRAJECTORY OF INVERTEBRATES AND INSECTS FOLLOWING SEDIMENT AUGMENTATION

140. **Saumaun Zadeh**, Biology Department, Loyola Marymount University

SEROTONIN 2B RECEPTOR EXPRESSION IN EARLY EMBRYOGENESIS

141. **Justin Liu**, Sage Hill School

PATHWAY-LEVEL EFFECTS OF CELL CULTURE DIMENSIONALITY ON HIPSC-DERIVED DA NEURON TRANSCRIPTOMES

142. **Adelina Grotenhuis**, Dept. of Biology, Pomona College  
EFFECT OF WATER TEMPERATURE ON GOLDEN ROCKWEED
143. **Simon Leonard**, Biology Department, Pomona College  
10-YEAR ASSESSMENT OF CHANGES ON BEETLE ASSEMBLAGES AT THE ROBERT J. BERNARD FIELD STATION
144. **Hannah Kotek**, Biology Department, Loyola Marymount University  
PIGMENT CONTENT IN *L. PEREZII* LEAVES AT VARIOUS STAGES OF DEVELOPMENT
145. **Isabella Pezo**, Biology Department, Loyola Marymount University  
SPATIAL AND TEMPORAL REGULATION OF *PILA* GENE EXPRESSION DURING RHIZOBIUM-LEGUME SYMBIOSIS
146. **Fatima Villalbazo**, California State University San Bernardino  
DOCUMENTING MARINE BIODIVERSITY ALONG THE PACIFIC COAST
147. **Luigi Miguel Quintana**, Biology Department, California State University, Dominguez Hills  
CONSERVING ORPHANED PALEONTOLOGICAL RESOURCES
148. **Hailey Pistochini**, Concentration in Life Sciences, Soka University of America  
PHYSIOLOGICAL RESPONSE OF *SILVETIA COMPRESSA* TO WARMING
149. **Tina Wu**, Research and Collections Department, Natural History Museum of Los Angeles County  
DIGITIZATION OF FRESHWATER FISHES IN CALIFORNIA
150. **Sean Boyd**, Department of Biological Sciences, California State University, Long Beach  
EVALUATING THE ROLE OF CYANOPHAGES IN SHAPING THE PICOCYANOBACTERIA ECOLOGY OF OCEANS
151. **Marley Yagle**, Biological Sciences Department, California State University Long Beach  
ZOOSPORIC PARASITES EMERGE DURING DIATOM BLOOMS IN THE SOUTHERN CALIFORNIA BIGHT ECOSYSTEM

152. **Diana Rodriguez**, Environmental Science and Resource Management, CSU Channel Islands  
SUSPECTED MICROPLASTIC OCCURRENCE IN ISLAND FOX SCAT ON SANTA CRUZ ISLAND, CA
153. **Ryan Moinazad**, Marine Biodiversity Center, Natural History Museum of LA County  
FIXING THE FORMALIN PROBLEM: LOW-COST DNA EXTRACTION FROM FORMALIN PRESERVED INVERTEBRATES
154. **Chloe Saldaña**, Biological Sciences Department, California State University Los Angeles, Natural History Museum of Los Angeles County  
GENOMIC VARIATION IN COWCOD (SEBASTES LEVIS)
155. **Laura Díaz**, Organizational Leadership Program, University of La Verne  
PRE-CLASS AI PODCASTS IMPROVE ECOLOGY LEARNING
156. **Kyla Monique Cabrera**, Schmid College of Science and Technology, Chapman University  
INTERTIDAL SPECTRAL VARIABILITY FROM SPACE
157. **Taylor Puno**  
APIS WING ECOMORPHOLOGY UNDER URBAN CHANGE
158. **Leeza-Marie Rodriguez**  
FACILITATION BETWEEN O. LURIDA AND INVASIVE MUSSEL
159. **Ana Rowley**, Scripps College  
SPLASHPool DIETS INFLUENCE CONSUMER HEAT TOLERANCE
160. **Steven Wei**, Wrigley Institute for Environment and Sustainability & Environmental Studies Department, University of Southern California  
MARINE PRIMARY PRODUCTION IN THE SAN PEDRO CHANNEL
161. **Breana Morales**  
COMPLEMENTARITY IN PITCHER PLANT ROTIFERS

162. **Kelsey Djan**, Ecology and Evolutionary Biology Department, University of California, Irvine

DO SOUTHERN CALIFORNIA MUSSELS HAVE MICROPLASTICS?

163. **Kiana Kelley-Fann**, Biological Sciences Department, Mount Saint Mary's University LA

ANTIMICROBIAL RESISTANCE IN DOMESTIC POULTRY

164. **Marijo Peña**, Biology Department, University of La Verne

PHOTOSYNTHETIC STRATEGIES OF INVASIVE PLANTS

165. **Deanni Armstrong**, California State University, San Bernardino

ACTIVITY PATTERNS OF WESTERN FENCE LIZARDS (*SCELOPORUS OCCIDENTALIS*) IN  
NATURAL AND URBAN SITES



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## ABSTRACTS IN PROGRAM ORDER

### 1. CRYPTIC CITY SNAILS: TWO SPECIES OF INTRODUCED FLATCOIL SNAILS (POLYGYRA) IN SOUTHERN CALIFORNIA

Viet Thanh<sup>1</sup>, Jann Vendetti<sup>2</sup>

<sup>1</sup> Department of Ecology and Evolutionary Biology, UCLA

<sup>2</sup> Malacology Department, Natural History Museum of Los Angeles County

Corresponding Author: Jann Vendetti, Malacology Department, Natural History Museum of Los Angeles County (jvendetti@nhm.org)

The southern flatcoil snail, *Polygyra cereolus* (Megerle von Mühlfeld, 1818), is a small terrestrial gastropod native to the Southeastern U.S., including Georgia and Florida. In 2012, this species was found in the Nature Gardens of the Natural History Museum of Los Angeles County, its first record in the region. Since then, *P. cereolus* has been documented across Southern California, presumably having been accidentally introduced with plants and soil through the horticulture trade. As of winter 2026, there were just over 1,200 *P. cereolus* iNaturalist observations in Southern California. However, when collected species of putative *P. cereolus* were sequenced for their DNA barcodes, there were two distinctly different haplotypes, indicating that a phenotypically similar species — *Polygyra septemvolva* Say, 1818, the Florida flatcoil — may also be present in Southern California. Identification keys differ in their confidence that an internal parietal lamella (a shell thickening) can differentiate these two species; so this character is examined against barcode haplotypes. The discovery of *P. septemvolva* in Southern California is not the first example of a cryptic terrestrial gastropod in Southern California being identified via DNA barcoding, an indication that there may be more unrecorded biodiversity within the region's introduced terrestrial snails and slugs.

### 2. YARROW'S SPINY LIZARDS AND OTHER POTENTIAL INTENTIONAL HERPETOFAUNAL RELEASES IN SOUTHERN CALIFORNIA

Gregory B. Pauly<sup>1</sup>, Estella Hernandez<sup>1</sup>, Julian Tso<sup>1</sup>

<sup>1</sup> Urban Nature Research Center and Department of Herpetology, Natural History Museum of Los Angeles County, Los Angeles, CA, USA

Corresponding Author: Gregory B. Pauly, Urban Nature Research Center and Department of Herpetology, Natural History Museum of Los Angeles County, Los Angeles, CA, USA (gpauly@nhm.org)

Community science efforts have revealed a number of nonnative reptiles and amphibians that are now established in Southern California. Here, we describe the detection of an introduced population of Yarrow's Spiny Lizards, *Sceloporus jarrovii*, in the San Jacinto Mountains and ongoing efforts to eradicate this population. Further, we note that there are three other introductions in the general region in which species have shown up in locations where they have become established or were likely to become established. This pattern suggests the intentional introductions of reptiles and amphibians into wildland areas. This pattern is in striking contrast with most recent detections of introduced reptiles in Southern California, which have been in urban and suburban areas. We discuss this novel threat to native species and the importance of community science in detecting introductions.

#### 4. ECOMORPHOLOGICAL RESPONSE OF SOUTHERN CALIFORNIA BOBCATS TO DUAL FILTERS OF ANTHROPOGENIC SELECTION

Dayun Suh<sup>1</sup>, Mairin A. Balisi<sup>2</sup>

<sup>1</sup> University of California, Los Angeles

<sup>2</sup> Alf Museum of Paleontology

Corresponding Author: Dayun Suh, University of California, Los Angeles (msdianesuh@gmail.com)

Urban ecosystems are the product of successive human restructuring imposing at least two selective filters over millennia. The first filter – the Late Quaternary extinctions ca. 10,000 to 50,000 years ago – represents an early anthropogenic trophic re-organization through megafaunal collapse. The second filter, the urban Anthropocene, is defined by habitat fragmentation and food subsidies. Here, we track the response of a North American carnivore and Ice Age survivor – the bobcat *Lynx rufus* – to these filters, quantifying skeletal ecomorphology from Pleistocene to present-day. We first establish a baseline using fossil and historic specimens from Los Angeles (L.A.), Southern California, USA, assessing impacts following the extinction filter. We then compare populations across the urban-to-rural mosaic from Greater L.A. to neighboring Kern County. We find that Pleistocene bobcats trended larger than modern. Dietary function, however, stayed largely consistent over that time, differing more between modern-day rural and urban populations. Rural bobcats exhibit different patterns of dental sexual dimorphism from urban, suggesting varying impacts on female and male resource use. Post-cranial differences between fossil and modern bobcats suggest locomotor shifts potentially tracking landscape and prey change. Overall, bobcats as obligate carnivores appear to respond conservatively and consequently may be more vulnerable to ecosystem change than other mesocarnivores.

#### 5. THE NHMLAC BAT ROOST COUNT: REMOVING BARRIERS TO PARTICIPATION IN SCIENCE WHILE STUDYING URBAN BATS.

Miguel Ordeñana<sup>1</sup>, Rachel Blakey<sup>2</sup>, Jill Carpenter<sup>3</sup>, Amy Jaecker-Jones<sup>1</sup>, Liliana Hernandez<sup>1</sup>

<sup>1</sup> Community Science, Natural History Museum of Los Angeles County

<sup>2</sup> Biological Sciences Department, Cal Poly Pomona

<sup>3</sup> Department of Ecology and Evolutionary Biology, UCLA

Corresponding Author: Miguel Ordeñana, Community Science, Natural History Museum of Los Angeles County (mordenana@nhm.org)

Bat roost emergence counts are valuable surveys that help researchers monitor bat maternity roosts to track annual reproductive success, population trends, and provide baseline roost behavior data to prepare for disease outbreaks. Known bat roosts in Los Angeles County are located in humanmade structures, mainly under large freeways. Monitoring these roosts requires substantial people power due to the size of the freeways and the amount of entry and exit points per roost. The Natural History Museum of L.A. County began organizing bat roost emergence counts in partnership with UCLA and Cal Poly Pomona bat researchers to fill in major data gaps in bat ecology within L.A. County while introducing hundreds of community members to the local ecology and conservation issues facing bats. The integration of community scientists has allowed the museum to consistently monitor 6 roosts since 2021, the largest effort of its kind. Our recorded counts vary, sometimes exceeding 1000 bats, however the diversity of experience levels, visibility at roosts has impacted the accuracy of our data at certain locations and we are piloting models to account for these variables. To account for these variables and estimate roost population size, we are using a negative binomial N-mixture models, incorporating imperfect detection. The unprecedented size of our community science efforts has given us the capacity to address long overdue questions and reduce barriers for participation in bat research.

#### 6. URBAN DARK-EYED JUNCOS ESTABLISH A LOWER AGGRESSION BASELINE FOLLOWING THE PANDEMIC LOCKDOWN

Marlene Walters<sup>1</sup>, Eleanor S. Diamant<sup>2</sup>, Joey F. Di Liberto<sup>1</sup>, Sara Lim<sup>1</sup>, Russell M. Stottlemeyer<sup>1</sup>, Pamela Yeh<sup>1</sup>

<sup>1</sup> Department of Ecology and Evolutionary Biology, UCLA

<sup>2</sup> Biology Program, Bard College

Corresponding Author: Marlene Walters, Department of Ecology and Evolutionary Biology, UCLA  
(mawalters@ucla.edu)

Cities are evolutionarily novel environments that impose numerous unique stressors on wildlife. By temporarily removing regular human activity from the urban environment, the COVID-19 pandemic lockdown created a natural experiment otherwise impossible to replicate. We investigated whether the post-lockdown increase of human activity affected territorial behavior in urban dark-eyed juncos (*Junco hyemalis*) at UCLA, as we previously observed that territorial aggression decreased during the lockdown. We found population-wide territorial aggression has remained significantly lower than the pre-pandemic baseline for three years post-lockdown. Furthermore, because individual birds were uniquely color-banded, we found differences between cohorts that would have otherwise been masked: younger individuals who began breeding during the lockdown (2020–2021) increased their aggression post-lockdown (2022) while older individuals with pre-pandemic experience did not. Relief from stress associated with human activity during the pandemic lockdown may have acted as a behavioral reset, allowing the population to transition away from a potentially maladaptive, high-aggression phenotype. Additionally, we show that flexibility in territorial aggression may be informed by prior life experiences.

## 7. ASSESSING SPATIAL AND ALTITUDINAL VARIATION IN ARTIFICIAL LIGHT AT NIGHT ACROSS URBAN LOS ANGELES

Joseph N. Curti<sup>1</sup>

<sup>1</sup> Institute of the Environment and Sustainability, University of California, Los Angeles (UCLA)

Corresponding Author: Joseph N. Curti, Institute of the Environment and Sustainability, University of California, Los Angeles (UCLA) (jcurti3@g.ucla.edu)

Research on the drivers of biodiversity loss associated with urbanization has primarily focused on direct impacts such as habitat loss and fragmentation, yet there is a growing body of literature that emphasizes widespread and intense indirect impacts due to anthropogenic stressors such as artificial light at night (ALAN). It is also presumed that these stressors extend into the lower atmosphere which serves as critical habitat for a range of plants and animals that use this space to migrate, hunt, and perform important behaviors. While research on ALAN has demonstrated broad effects across taxonomic groups related to fitness, development, and site selection, most research on ALAN has relied on remotely sensed products in 2-dimensional space, which likely underestimate impacts to flighted animals that navigate the complex variation in ALAN in 3-dimensional space including bats and nocturnally migrating birds. Therefore, we developed a novel drone-based platform for assessing altitudinal variation in ALAN using a portable field spectroradiometer that is capable of capturing the complete spectra of light at different altitudinal strata with high degrees of sensitivity across urban areas in Los Angeles. In this talk, we will investigate some preliminary ALAN data across different altitudinal bands and lead a discussion on different extensions and applications of this work to model 3-dimensional connectivity of flighted animals across Los Angeles.

## 8. ASHES TO RECOVERY: WILDFIRE-RESPONSIVE MANAGEMENT OF THE ENDANGERED TIDEWATER GOBY

Brenton Spies<sup>1</sup>, Rosi Dagit<sup>2</sup>, Chris Dellith<sup>3</sup>, Eric Morrissette<sup>3</sup>, Mira Abrecht<sup>4</sup>, David Jacobs<sup>4</sup>

<sup>1</sup> Environmental Science and Resource Management Program, California State University, Channel Islands

<sup>2</sup> Resource Conservation District of the Santa Monica Mountains

<sup>3</sup> U.S. Fish & Wildlife Service

<sup>4</sup> Dept. of Ecology and Evolutionary Biology, University of California, Los Angeles

Corresponding Author: Brenton Spies, Environmental Science and Resource Management Program, California State University, Channel Islands (brenton.spies@csuci.edu)

In January 2025, the Palisades Fire caused extensive impacts to the Topanga Canyon watershed, sending ash, fire retardant, and a range of fire-related debris and contaminants into Topanga Lagoon, a critical habitat for the endangered northern tidewater goby (*Eucyclogobius newberryi*). Anticipating heavy post-fire runoff and degraded water quality, over 700 tidewater gobies were rescued and transported to two public Aquarium partners for temporary holding while their lagoon habitat recovered. During this period of managed care, aquarium conditions were carefully controlled to maintain survival and health, enabling the successful reintroduction of the population six months later once habitat conditions at Topanga Lagoon stabilized. This rapid response built on lessons from previous wildfires that revealed the heightened vulnerability of bar-built estuaries to fire-driven disturbance and the urgent need for preparedness. Genomic assessments further informed recovery planning by clarifying relationships among populations and supporting management decisions aimed at maintaining genetic integrity during reintroduction. This case illustrates how wildfire increasingly threatens coastal ecosystems and demonstrates the value of readiness, cross-sector collaboration, and evidence-based planning for the long-term conservation of sensitive lagoon-dependent species.

## 9. CENTERING COMMUNITIES: USC SEA GRANT'S APPROACH

Amalia Almada<sup>1</sup>

<sup>1</sup> Sea Grant Program, University of Southern California

Corresponding Author: Amalia Almada, Sea Grant Program, University of Southern California (amaliaal@usc.edu)

Growing support for community engagement in academic research reflects its potential to enhance public relevance and impact. Yet achieving truly collaborative partnerships—characterized by shared leadership, bidirectional learning, and knowledge co-production—can be a challenge in practice. This talk will highlight how the University of Southern California Sea Grant Program has approached recent community-engaged projects that integrate research and extension to center the priorities of California communities.

## 10. MULTIGENERATIONAL ENGAGEMENT IN BROWNFIELDS REUSE

Jessica Barlow<sup>1</sup>, Madison Swayne<sup>2</sup>

<sup>1</sup> Department of Geography, San Diego State University

<sup>2</sup> School of Public Affairs, San Diego State University

Corresponding Author: Jessica Barlow, Department of Geography, San Diego State University (jbarlow@sdsu.edu)

We present a comprehensive, transdisciplinary approach to community-based participatory research in support of brownfields assessment and reuse in an urban community impacted by decades of environmental injustices. Through an innovative partnership between a university, the city government, and local community organizations, the approach allowed for diverse opportunities for participation, engagement, input, and guidance by community members across the lifespan, thereby building momentum, trust, more accurate data, and a more informed and collaborative vision for brownfields reuse.

## 11. DEVELOPING AN ASSESSMENT FRAMEWORK FOR NATURE-BASED RECREATION, AN OVERLOOKED ECOSYSTEM SERVICE IN URBAN SETTINGS THAT DEPENDS ON ECOLOGICAL HEALTH

Raphael Mazor<sup>1</sup>, Lara Jansen<sup>1</sup>, Kris Taniguchi-Quan<sup>1</sup>, Abel Santana<sup>1</sup>, Anita M. Chaudhry<sup>2</sup>, William Kleindl<sup>3</sup>, Richelle Tanner<sup>4</sup>

<sup>1</sup> Southern California Coastal Water Research Project

<sup>2</sup> California State University Chico

<sup>3</sup> Montana State University

<sup>4</sup> Chapman University

Corresponding Author: Raphael Mazor, Southern California Coastal Water Research Project (raphaelm@sccwrp.org)

Nature-based recreation (NBR; e.g., bird watching, fishing, hiking) is vital for a community's physical and mental health. However, watershed managers need tools to determine how well their waterbodies support NBR, and thus they struggle to communicate the benefits of their decisions to the public. We used community-science datasets of natural history observations (e.g., iNaturalist, eBirds) to determine where NBR occurs within Southern California's coastal watersheds. We identified hot spots with high NBR and hot spots where NBR is less than expected. Regionally, NBR was not strongly related to ecological health, as the highest levels of NBR occurred in urban areas where ecological quality was poorest. However, within urban areas, NBR was higher near parks with natural areas and good public access points. The next phase of this study is to quantitatively evaluate factors that drive support for NBR and develop models to predict increases in NBR from restoration activities or water quality improvements. We will establish thresholds to identify waterbodies that adequately support NBR at levels appropriate for the surrounding land use and population density. Ultimately, this assessment framework will be integrated into decision-support systems that help managers evaluate multiple (sometimes competing) benefits of projects, such as stream restorations.

## 12. SUPPORTING A RESIDENTS' ADVOCACY COALITION FOR COMMUNITY-LED ENVIRONMENTAL RESEARCH DEVELOPMENT

Richelle Tanner<sup>1</sup>, Jill Hargis<sup>1</sup>, Joe Thompson<sup>1</sup>, Jake Comer<sup>1</sup>

<sup>1</sup> Orange Sustainability Group; Environmental Science & Policy Program, Chapman University

Corresponding Author: Richelle Tanner, Orange Sustainability Group; Environmental Science & Policy Program, Chapman University (rtanner@chapman.edu)

Community-engaged environmental science research can be difficult to kickstart because of the high literacy barrier to entry for this interdisciplinary field. Residents and stakeholders often struggle to acknowledge their expertise in their own communities for environmental solutions because of the "ivory tower" academic culture and a pervasive lack of transparency in the management actions of local government agencies. Nonetheless, residents' coalitions are increasing in popularity as an advocacy tool for environmental management and policymaking. However, they are rarely operationalized to participate in research design, development, and implementation. Here, we detail how the Orange Sustainability Group (OSG) has adopted research into their broad advocacy goals for the City of Orange and the role of Chapman University and its students and faculty. We discuss necessary engagement strategies from the academic angle (including literacy-building), resource commitments, and structures that facilitate fruitful research proposals that are attainable for student-led projects. We also briefly explore the OSG's role in the research and development for the Orange Sustainability Plan, led by Chapman's Environmental Science & Policy Program, and other student-led research projects. Residents' coalitions that are organically built outside of the university environment (i.e., not a traditional advisory group) are important contributors to the community-engaged research space.

## 13. LIVING WITH RECURRING FIRE: BUILDING ADAPTIVE CAPACITY THROUGH GRASSROOTS FIRE RESPONSE

Sara O'Connor<sup>1</sup>

<sup>1</sup> Geography Department, California State University- Long Beach

Corresponding Author: Sara O'Connor, Geography Department, California State University- Long Beach (sara.oconnor@csulb.edu)

The Palisades Fire in 2025 struck Malibu and the surrounding areas with gale force winds, requiring rapid mobilization. During the event which quickly grew beyond local emergency responders' capacity to contain alone, the *Community Brigades* were activated by the official response. The *Brigades* differ from traditional volunteers; they are community members networked with the official response system and trained by official response actors. Drawing upon qualitative data collected in the immediate aftermath of the Palisades Fire, this study explores how this volunteer fire response apparatus, officially associated through partnership and procedure with emergency responders, impacted the preparation,

mitigation, and response processes. Our findings show that this partnership facilitates *Brigades* to communicate with community members enhancing their situational awareness, empowering local action, informing community members about effective fire prevention, and bridging information silos between residents and the official response. The Community Brigades proved to be a trusted source of information for community members requiring assessments of their safety before, during and after the event, and, of local knowledge for emergency responders, resulting in improved communication networks and yielding greater community cognition. As evidenced by the Palisades Fire response, the *Brigades* are positioned to enhance trust between community and official responders before, during, and after a fire. The Brigades provide a blueprint for reimagined volunteer emergency response organizations, working synergistically instead of in tandem with the official response, expanding the pool of fire response resources and enhancing the capacity to respond to Wildland Urban Interface (WUI) specific challenges such as complex terrain, as the WUI population grows and their fire risk continuously increases.

#### 14. ROUND TABLE / PANEL DISCUSSION

Community Engaged Research Panel

#### 15. TISSUE INTERNALIZATION IN TURTLE GASTRULAE

Lila Le<sup>1</sup>, Perla Rand<sup>1</sup>, Maria Elena de Bellard<sup>2</sup>, Max Ezin<sup>1</sup>

<sup>1</sup> Biology Department, Loyola Marymount University

<sup>2</sup> Biology Department, California State University Northridge

Corresponding Author: Lila Le, Biology Department, Loyola Marymount University (lle18@lion.lmu.edu)

During the crucial process of gastrulation, differentiation of all germ layers set the basis of tissue development and organization. Amphibians, reptiles, and aves undergo gastrulation through varying mechanisms. While amphibians gastrulate via involution and aves by ingression, reptiles are an evolutionary intermediate, internalizing tissue in both ways. In reptiles, while ingression occurs ventrally, on the dorsal side, involution occurs at the blastopore lip following 3 main blastopore shapes: upturned, flat, and downturned. However, there is yet to be a sequential correlation of involuting ectodermal tissue with changing blastopore shapes during gastrulation. We aim to advance reptilian gastrulation understanding by correlating the changes in blastopore shapes with the progression of tissue internalization in turtles. Turtle eggs were incubated for 0-2 days post oviposition, at 6-hour time intervals. Gastrulae were harvested, cryosectioned, and imaged. We show that turtle blastopores begin upturned, flatten into a thin line after maturing 12-18 hours, and by 24 hours fully invert to a downturned curve. Furthermore, as the blastopore shape changed from upturned, to flat, to downturned, we found the following progression of internalized tissue respectively: partial, halfway, and complete. Our results help to further understanding of chelonian gastrulation and may inform on the evolution of gastrulation modes between amphibians and aves, with reptiles as a key transition.

#### 16. HATCH ORDER AND DIET IN GREAT BLACK-BACKED GULLS

Sofia Carranza<sup>1</sup>, Taleen Madikians<sup>1</sup>, Kristen Covino<sup>1</sup>

<sup>1</sup> Biology Department, Loyola Marymount University

Corresponding Author: Sofia Carranza, Biology Department, Loyola Marymount University (scarran2@lion.lmu.edu)

Great Black-backed Gulls (*Larus marinus*) are understudied with respect to intraspecific variation in dietary preferences. Our project's overall goal is to quantify dietary differences across individual Great Black-backed Gulls via stable isotope analysis. Isotope ratios from feathers provide information about the trophic level (nitrogen) and food sources (carbon). Our analyses reveal within-population variation in diet and patterns associated with chick hatch order and developmental stage. We examined feathers collected in 2022 from 97 hatchlings at a breeding colony in Maine. We found no difference in the nitrogen stable isotope ratios based on hatch order. However, carbon isotopes showed a difference, revealing that the A (first-to-hatch) chick has less negative carbon isotope values than the C (last-to-hatch)

chick. This suggests a biased maternal allocation of nutrients during egg formation, with earlier-laid eggs reflecting a greater contribution of marine-derived resources. In contrast, feathers collected from 72 pre-fledgling chicks in 2019 showed no hatch-order differences in carbon isotope values. Instead, we did find higher nitrogen isotope levels in A pre-fledglings than C pre-fledglings. This reflects post-hatch parental bias during feeding. Ultimately, our multi-year study will compare isotopic variation of repeated samples from the same chicks across the breeding season to examine how these temporal differences in feather isotopes are generated.

## 17. DNA METABARCODING OF GREAT BLACK-BACKED GULL DIET

Noopur Barve<sup>1</sup>, Dr. Kristen Covino<sup>1</sup>

<sup>1</sup> Biology Department, Loyola Marymount University

Corresponding Author: Noopur Barve, Biology Department, Loyola Marymount University (nbarve@lion.lmu.edu)

This research focuses on DNA analysis of cloacal samples from the Great Black-backed Gull (*Larus marinus*) on Appledore Island, Maine to better understand their ecological interactions as an apex predator. Cloacal samples from 2024 and 2025 (N = 208) have been collected from parents and chicks in various nests. Sample analysis will assess diet, foraging, and nest-feeding habits by examining nest-specific differences in prey consumption. This research uses the unique methodology of metabarcoding, an efficient and thorough DNA analysis method. Metabarcoding is used to determine if there is empirical support for the presence of a specific species in an individual's diet. Thus far, DNA has been extracted and processed from 12 samples, and 44 species have been cross-referenced against the sequenced DNA. The most frequent species detected within this sample set are *Leucophaeus atricilla*, *Sterna hirundo*, *Cancer borealis*, *Camponotus pennsylvanicus*, and *Ammodytes americanus*. Species frequency can indicate what species chicks are being fed, at what trophic level, and parental feeding habits. To our knowledge, this is the first diet analysis of Great Black-backed Gulls in North America conducted to this degree of precision. This research will provide a greater understanding of the diet of the Great Black-backed Gull and create future possibilities for metabarcoding in avian diet analysis to allow for greater specificity in findings.

## 18. ESTUARINE CRAB LOADED WITH DIVERSE PARASITES

Sasha Sypher<sup>1</sup>, Armand Kuris<sup>2</sup>, Kevin Lafferty<sup>3</sup>, Ryan Hechinger<sup>1</sup>

<sup>1</sup> Marine Biology Department, Scripps Institution of Oceanography at University of California San Diego

<sup>2</sup> Ecology, Evolution, and Marine Biology Department, University of California Santa Barbara

<sup>3</sup> Ecology, Evolution, and Marine Biology Department, US Geological Survey University of California Santa Barbara

Corresponding Author: Sasha Sypher, Marine Biology, Scripps Institution of Oceanography at UC San Diego (ssypher@ucsd.edu)

The striped shore crab, *Pachygrapsus crassipes*, is one of the most common and important animals in California estuaries, but its parasitism remains poorly understood. Because it is critical to understand the crab's parasitism to know its ecological role, we quantified parasite load and diversity in 559 crabs from three California/Baja California estuaries. Sixteen parasite species were detected, spanning various taxa and functional groups: trophically transmitted parasites, parasitic castrators, typical parasites, and pathogens. Almost every crab was infected (97% prevalence) and the average crab had ~2 parasite species (up to 5 in a single host). Trophically transmitted taxa dominated the assemblage in total individuals (99.9%), biomass (71%), and energy flux (83%), linking crabs to bird, teleost, and elasmobranch predators. Although parasitic castrators were rare (infecting 2% of crabs), their large body size contributed substantial parasite biomass and energy flux at the host population level. Total parasite biomass and energy-flux loads varied ~2.7-fold among wetlands. Maximum parasite biomass and energy-flux loads increased with crab size, but slower than theoretical expectations, suggesting host or ecological constraints on parasite accumulation that may reveal parasite increased predation rates. The diverse, variable yet omnipresent parasite community indicates important effects on *P. crassipes* performance and its role in estuarine food webs.

## 19. A NOVEL SEA ANEMONE HOST FOR THE SYMBIOTIC AMPHIPOD ORCHOMENELLA RECONDITA

Sriram V. Ramamurthy<sup>1</sup>, Angela C. Ho<sup>1</sup>, Armand M. Kuris<sup>1</sup>

<sup>1</sup> Ecology, Evolution, and Marine Biology (EEMB) Department, University of California - Santa Barbara

Corresponding Author: Angela C. Ho, Ecology, Evolution, and Marine Biology (EEMB) Department, University of California - Santa Barbara (angelaho@ucsb.edu)

The symbiotic amphipod *Orchonomenella recondita* has recently been discovered living within the gut of the solitary sea anemone *Anthopleura sola* - a host species from which it has never before been recovered. It has been described as an obligate endoparasite of the congeneric anemone *Anthopleura elegantissima*, although the exact nature of this relationship is still unclear. Here, by collecting *O. recondita* from individuals of *A. sola*, we provide new information on its life history, population structure, and population dynamics. Preliminary data indicate a male-biased sex ratio (~2:1), suggesting potential sex-specific dispersal or life-history trajectories. Intensity of amphipods in *A. sola* ranges from 1-10 amphipods per host, while prevalence may range from 3% to upwards of 30%. Clarifying the nature of the relationship between *O. recondita* and sea anemones advances our understanding of cryptic symbiotic associations in otherwise well-studied California rocky intertidal ecosystems. Characterizing the nature of the relationship has broader implications for how host-symbiont interactions may evolve and how parasitism may arise from predatory or commensal lineages.

## 20. PARASITIC FLATWORMS WITH SOLDIERS DEVELOPMENT AND AGING IN THE REPRODUCTIVE SOCIAL CASTE

Rhowan Ho<sup>1</sup>, Ryan Hechinger<sup>1</sup>

<sup>1</sup> Marine Biology Department, Scripps Institution of Oceanography

Corresponding Author: Rhowan Ho, Marine Biology Department, Scripps Institution of Oceanography (ho.rhowan@gmail.com)

A eusocial division of labor involving a non-reproducing soldier caste has been documented for 15 species of trematode flatworm parasites, which form colonies of worms (rediae) in their host snails. Despite their ecological abundance, importance to food webs, and public health relevance, not much is known about the development of their castes. For most species, it is unclear if soldiers metamorphosize to enter the reproductive caste, or if reproductives typically made de-novo. In this study, we use bright-field and transmission electron microscopy to document the morphology and reproductive development of the rediae for six trematode species in two families. We track overall somatic morphology and the development of the central reproductive organ—the germinal mass—from its emergence in pre- or post-partum worms, to its presence in ripe reproductives, and to its exhaustion. We provide colony-wide frequencies of senescence to facilitate future work estimating reproductive redia death rates and longevities. The results concerning early reproductive development support either (1) that there is a separate group of immature reproductives that are morphologically indistinguishable from soldiers, yet do not serve as soldiers, or (2) that metamorphosing soldiers are the only source of new reproductives. We favor the second. Overall, these findings help fill fundamental knowledge gaps concerning trematode caste biology and dynamics.

## 21. FOOD-WEB EXPLOITING PARASITES DOMINATE PARASITIC LOAD AND DIVERSITY IN JACKKNIFE CLAMS

Rizzuti C.G.<sup>1</sup>, Kuris A.M.<sup>2</sup>, Lafferty K.D.<sup>3</sup>, Hechinger R. F.<sup>1</sup>

<sup>1</sup> Scripps Institution of Oceanography, University of California, San Diego

<sup>2</sup> University of California, Santa Barbara

<sup>3</sup> USGS, University of California, Santa Barbara

Corresponding Author: Rizzuti C.G., Scripps Institution of Oceanography, University of California, San Diego (crizzuti@ucsd.edu)

Jackknife clams (*Tagelus* species) are one of the most ecologically important animals in California estuaries, yet little is reported about their parasites. Because their parasites may impact the clams and the surrounding food web, we quantified the diversity and abundance of metazoan parasites in 131 clams from two California/Baja California wetlands: Carpinteria Salt Marsh (CSM) and Estero de Punta Banda (EPB). Each clam was infected, typically with 3 species, but with a maximum of 7. We detected 12 parasite species on the whole, with EPB having 66% more species than CSM. Trophically transmitted parasites dominated the parasite community in terms of abundance (99.9%), biomass (81.9%), and energy flux (81.9%), highlighting the importance of jackknife clams as prey for vertebrate predators. A single infection by a trematode parasitic castrator composed 16% of aggregate parasite biomass and energy flux on EPB mudflats, reflecting their probable importance to the surrounding community. Parasite biomass and energy-flux loads of individual clams were ~3 higher at EPB than CSM. Energy-flux load increased as theoretically expected with clam size, but at EPB we observed a strong deceleration. This deceleration of parasite load and the lack of large clams at EPB suggest intense behavior modification by trophically transmitted parasites to increase predation rates. These results shed light on the impact of parasites on jackknife clams and on their role in estuarine food webs.

## 22. HIDDEN IN PLAIN SIGHT: UNVEILING A NEWLY DOCUMENTED PARASITIC ISOPOD IN ZEBRA PERCH

Juliana Granados<sup>1</sup>, Matt Dean<sup>2</sup>, Regina Wetzer<sup>3</sup>

<sup>1</sup> Biological Sciences, University of Southern California, Natural History Museum of Los Angeles

<sup>2</sup> Department of Biological Sciences, University of Southern California

<sup>3</sup> Research and Collections Department, Natural History Museum of Los Angeles

Corresponding Author: Juliana Granados, Biological Sciences Undergraduate at University of Southern California, Natural History Museum of Los Angeles (julianagranados.jgl@gmail.com)

Cymothoid isopods are well-known fish parasites, with members of *Ceratothoa* commonly found in the buccal cavity. Despite a high incidence of infection, we document a previously-unreported host-parasite relationship on Zebra Perch (*Kyphosus azureus*), an herbivorous fish in the shallow marine waters off Southern California. We observe the presence of a potentially undescribed *Ceratothoa* that exhibits an atypical attachment pattern. Infamously most congeners attach to the tongue, but these female isopods are primarily located on the roof of the fish's mouth. Micro-computer tomography ( $\mu$ CT scanning) on both male and female specimens provides insight to the internal isopod reproductive anatomy. Due to their lifestyle as sequential hermaphrodites and limited swimming ability as adults, their mating dynamics are a mystery. Observations of females revealing various stages of brood development allow for this unexplored isopod system to be a model for paternity testing, since multiple males can be associated with a single female. Our findings thus far provide a foundation for determining whether this represents a new species or reveals a much larger range for a member of *Ceratothoa* than previously known, as comprehensive mapping and molecular research has been limited. By integrating morphological data with high-resolution imaging, our findings pave the way for a formal description of this unique population an

## 23. RESEARCH EXPERIENCES IN SOUTHERN CALIFORNIA FOR UNDERGRADUATE ECOLOGISTS NETWORK (RESCUE-NET)

Wallace Meyer<sup>1</sup>, Nina Karnovsky<sup>1</sup>, Cinzia Fissore<sup>2</sup>, George Vourlitis<sup>3</sup>, Darren Sandquist<sup>4</sup>

<sup>1</sup> Biology Department, Pomona College

<sup>2</sup> Department of Biology and Environmental Sciences, Whittier College

<sup>3</sup> Department of Biological Sciences, California State University, San Marcos

<sup>4</sup> Department of Biological Sciences, California State University, Fullerton

Corresponding Author: Wallace Meyer, Biology Department, Pomona College (wallace\_meyer@pomona.edu)

The Research Experiences in Southern California for Undergraduate Ecologists network (RESCUE-Net) is currently composed of 50 collaborating ecological faculty from 24 Southern California institutions. Our objective is to provide

immersive ecological training opportunities for undergraduates and equip them with the knowledge and skills necessary to tackle our region's unprecedented ecological challenges. All RESCUE-Net activities are developed around three guiding principles: (1) Engaging undergraduates in authentic ecological research is a critical to the development of professional ecologists; (2) Collaboration enhances both student learning and the quality of research products; and (3) Inclusive-focused activities are key to attracting, retaining, and training a diverse group of undergraduates to lead the next generation's conservation workforce. In addition, RESCUE-Net is focused on bolstering faculty collaborations across the region, offering faculty development opportunities through participation in the network and mentoring support, while simultaneously collecting high quality ecological data for publication. At SCAS, we will highlight educational opportunities that have been developed and implemented in past academic years and highlight some of the opportunities scheduled for the 2026-27 academic year. Student presentations following this talk will highlight some of the student experiences and research products produced through RESCUE-Net.

#### 24. C AND N STABLE ISOTOPE RATIOS IN NATIVE PLANTS

Ava Santos-Volpe<sup>1</sup>, Robert Brandon Pratt<sup>2</sup>, George L. Voulitis<sup>3</sup>, Monica Uriaz<sup>2</sup>, Marlem Lopez-Meza<sup>3</sup>, Adam Sanders<sup>4</sup>, Ethan Esparaza<sup>5</sup>, Calvin Kamimura<sup>6</sup>, Cinzia Fissore<sup>6</sup>, Ehren Moler<sup>4</sup>, Dustin VanOverbeke<sup>5</sup>, Wallace M. Meyer III<sup>1</sup>

<sup>1</sup> Biology Department, Pomona College

<sup>2</sup> Department of Biological Sciences, California State University Bakersfield

<sup>3</sup> Department of Biological Sciences, California State University San Marcos

<sup>4</sup> Department of Biological Sciences, California Polytechnic State University at Pomona

<sup>5</sup> Department of Biology, University of Redlands

<sup>6</sup> Department of Biology and Environmental Science Program, Whittier College

Corresponding Author: Ava Santos-Volpe, Biology Department, Pomona College (amss2022@mymail.pomona.edu)

To assess if water subsidies in managed landscapes affect plant water use efficiencies (WUE), we measured carbon (d13C) and nitrogen (d15N) stable isotopes abundances and N concentrations in native vegetation growing in urban and natural areas at six college campuses in Southern California. We hypothesized that leaves of native shrubs in areas with no supplemental irrigation ("natural areas") have higher d13C but lower d 15N abundances than conspecifics in urban areas subsidized with irrigation ("managed areas"). We found that average foliar d13C declined linearly as aridity increased across campuses, but only for plants in natural areas, suggesting that irrigation decoupled WUE. Plants in managed areas also had lower d 13C values than conspecifics in natural areas, suggesting that plants in natural areas had higher WUE than plants in managed areas. Plants in managed areas also had higher leaf d15N values, presumably because fertilization and irrigation increase N availability as evidenced by increased N in leaf tissue. These data suggest that native plants that normally exhibit stomatal control over water loss in natural areas might lose that ability when supplemented with water subsidies. Combined, our results highlight that urban management practices alter how plants obtain and utilize resources. As urbanization lowers WUE, efforts to preserve limited water resources may not be effective if water and nutrient subsidies are not considered when planting native species.

#### 25. ARE MTN MAHOGANY LEAVES SIMILAR FROM 7001800 M?

Erica L. Strozier<sup>1</sup>, Dr. Darren R. Sandquist<sup>1</sup>

<sup>1</sup> Department of Biological Science, California State University, Fullerton

Corresponding Author: Erica L. Strozier, Department of Biological Science, California State University, Fullerton (estrozier@csu.fullerton.edu)

Leaf carbon isotope ratio ( $D^{13}C$ ) can be used as a time-integrated measure of the balance between carbon gain and water loss. We examined this balance in birch-leaf mountain mahogany (*Cercocarpus betuloides*) plants spanning an elevation gradient of 1,100 m in the northeastern San Gabriel mountains. Mean maximum vapor pressure deficit (VPD) and mean annual temperature (T) decreased from low to high elevations over the gradient, but rainfall was relatively

consistent (515–670 mm) throughout. Leaf  $\delta^{13}\text{C}$  values and LMA (leaf mass per area) values were expected to parallel differences in VPD and T, reflecting stomatal responses to ambient desiccation pressures (i.e., higher  $\delta^{13}\text{C}$  and higher LMA with increasing VPD and T). However, there was no significant difference in  $\delta^{13}\text{C}$  over the elevation gradient both in 2024 and in 2025. Mean  $\delta^{13}\text{C}$  values during both years were low (–29.8 to –27.2 ‰) and did not correlate with climate parameters or with leaf nitrogen content. In 2024, there was a positive correlation between LMA and VPD, with 12% increase in LMA. In contrast, there was no correlation between LMA and VPD in 2025. These results suggest that these leaf functions of *Cercocarpus betuloides* are largely decoupled from the desiccation pressures of the ambient aerial environment, which may contribute to the success of this species over such a broad range of elevations and latitudes.

## 26. URBAN OASES: MICROHABITAT ALTERS HYDRIC PHYSIOLOGY

Stella Raymond<sup>1</sup>, Kinsey Brock<sup>2</sup>, Emily M. Taylor<sup>1</sup>, Department of Biological Sciences<sup>3</sup>

<sup>1</sup> Department of Biological Sciences, California Polytechnic State University, San Luis Obispo

<sup>2</sup> Department of Biology, San Diego State University

<sup>3</sup> California State University Long Beach

Corresponding Author: Stella Raymond, Biological Sciences Department, California Polytechnic State University San Luis Obispo (srraymon@calpoly.edu)

Urbanization drastically restructures environments and often imposes constraints on urban-dwelling organisms. In urban areas, increased temperature (Urban Heat Island Effect) and increased water availability (Urban Oasis Effect) work in tandem to produce novel conditions that might not exist otherwise. Despite increasing human activity, we lack a general understanding of how relative and combinatorial effects of urban conditions affect wildlife. The objective of this study was to analyze how the thermal and hydric characteristics of microhabitats relate to ectotherm physiology. Across 11 Southern California colleges, we continuously logged microclimatic conditions at paired urban and non-urban sites. Further, we measured the hydric physiology of Western Fence Lizards (*S. occidentalis*) at each site during spring (rainy) and fall (dry). We discovered that urban sites had higher humidity and soil moisture. This was associated with lower temperatures, likely due to greater water availability. Regardless of site, plasma osmolality was lower in spring compared to fall. Urban lizards had lower osmolality both in spring and fall, indicating higher hydration than non-urban lizards. Cutaneous evaporative water loss of lizards was similar between sites in spring, but declined in non-urban lizards in fall, likely as a mechanism to prevent desiccation during the dry season. Our results suggest that water on college campuses may help mitigate the harmful effects of urbanization.

## 27. COMPARING CARBON-FLUX ACROSS URBAN AND NATURAL LANDSCAPING SCHEMES

Valerie Wang<sup>1</sup>, Stella Ruebel<sup>2</sup>, Yuankai Alex Gao<sup>1</sup>, Erin Halligan<sup>3</sup>, Mara Welch<sup>2</sup>, Siobhan Boyle<sup>1</sup>, Wallace Meyer<sup>1</sup>

<sup>1</sup> Biology Department, Pomona College

<sup>2</sup> Scripps College

<sup>3</sup> Biology Department, Pomona College

Corresponding Author: Valerie Wang, Biology Department, Pomona College (valeriewang040507@gmail.com)

Urbanization alters soil processes that regulate atmospheric carbon-flux, yet the mechanisms underlying C-flux in managed landscapes remain poorly resolved, particularly in Mediterranean ecosystems. This study examines how C-flux, soil carbon pools, and biotic (fungi and bacteria) and abiotic (temperature and moisture) factors differ among urban landscaping motifs and natural ecosystems in southern California. Carbon flux measurements were collected from four different habitats (lawn, mulch, shrub, and natural) using LI-8100A Automated Soil CO<sub>2</sub> Flux System over four, 4-week periods, with us targeting different seasons. Results showed that carbon flux is elevated in urban landscaping motifs. Lawns emitted 6,075 metric tons more CO<sub>2</sub> per km<sup>2</sup> annually compared to sage scrub, which is roughly equivalent to the emissions from 1,320 passenger vehicles. While shrub and mulch areas had lower carbon flux than

lawns, they still emitted 2,188 and 1,725 metric tons more CO<sub>2</sub> per km<sup>2</sup> per year than sage scrub, respectively. Preliminary analyses suggest that differences in soil moisture and fungal and bacterial biomass are positively correlated with C-flux across habitats. Data on soil C, N concentrations and quantities are ongoing. Our results highlight that if we aim to reduce C-emissions in urban areas, we should aim to mimic conditions in natural areas.

## 28. GENETIC POPULATION STRUCTURE AND PHYLOGENETIC RELATIONSHIPS OF BANANA SLUGS (ARIOLIMAX SPP.).

Cassandra Jordan<sup>1</sup>, Julian Banuelos Torres<sup>1</sup>, Sophia Badillo<sup>1</sup>, Janet Leonard<sup>2</sup>, Jann Vendetti<sup>3</sup>

<sup>1</sup> Department of Biological Sciences, California State University San Marcos

<sup>2</sup> Institute of Marine Sciences, University of California, Santa Cruz.

<sup>3</sup> Malacology Department, Natural History Museum of Los Angeles County

Corresponding Author: Sergio Nigenda-Morales, Department of Biological Sciences, California State University San Marcos (snigenda@csusm.edu)

The banana slug genus *Ariolimax* is a small genus of terrestrial gastropods widely distributed along the Pacific Coast of North America, from Alaska to California. Six species have been described and differentiated based on reproductive organ morphology. Previous molecular identification has relied primarily on mitochondrial DNA (mtDNA). Although morphological and mtDNA-based approaches produce similar classifications of *Ariolimax* species, they are not fully concordant. In addition, the broad geographic distribution of the genus has resulted in isolated populations. In this study, we analyzed nuclear genomic data to assess genetic population structure and phylogenetic relationships among *Ariolimax* species. We examined 33 samples collected from sites across the entire geographic range. Using double digest restriction-site associated DNA sequencing (ddRAD-seq), we identified over 190,000 single nucleotide polymorphisms (SNPs). These genome-wide data revealed strong genetic structure, clearly differentiating most *Ariolimax* species. Furthermore, although the inferred phylogenetic relationships largely recapitulate morphological and mtDNA-based classifications, we identified genetic clusters that are inconsistent with previous taxonomic assignments. For example, we found further clustering in the *A. columbianus* and *A. californicus* clades. This finding demonstrates that genome-wide analyses can uncover previously unrecognized genetic lineages that may represent distinct populations

## 29. ROLE OF URBAN STREET BUFFERS ON THE DELIVERY OF KEY ECOSYSTEM SERVICES

Anna Bowen<sup>1</sup>, Dani Gaspar<sup>2</sup>, Preston Bush<sup>3</sup>, Olive Ausness<sup>1</sup>, Diego Pacheco-Reyes<sup>4</sup>, Palmer Patel<sup>1</sup>, Lua Lopez<sup>3</sup>, George L. Vourlitis<sup>2</sup>, Wallace M. Meyer III<sup>5</sup>, Cinzia Fissore<sup>1</sup>

<sup>1</sup> Environmental Science Program, Whittier College

<sup>2</sup> Biological Sciences Department, California State University San Marcos

<sup>3</sup> Department of Biological Sciences, California State University at San Bernardino

<sup>4</sup> Department of Biology, Harvey Mudd College

<sup>5</sup> Biology Department, Pomona College

Corresponding Author: Anna Bowen, Environmental Science Program, Whittier College (abowen@whittier.edu)

Soil in urban green space has the potential to deliver important ecosystem services, including soil carbon sequestration and microbial diversity. Despite being a ubiquitous feature of urban green spaces, soil in road buffer strips has been largely overlooked, and therefore its potential to deliver on such ecosystem services is poorly understood. Here, we investigated labile SOC and microbial composition and diversity in buffer strips located in five different urban areas across Southern California, with sampling locations selected in relation to income brackets. We observed that indicators of landscape management were more present in high income areas, such as presence of irrigation (76% vs 52%), more active landscaping (80% vs 40%). Organic matter (OM) content varied across sites, ranging from 1.7% to 26% and so did fLF (representing 0.1 to 15% of total SOC), and there was no significant difference in OM% or fLF % between income areas. Large differences in OM%, fLF and management practices was observed across the five urban areas, indicative of different decision-making process at the local level. Microbial DNA was also investigated with a

metagenomics approach for microbial composition and abundance, which is in progress. This work highlights the ecological relevance of soil in road buffer strips and the need to better understand the drivers, in particular management practices, of soil ecosystem services delivered by buffers in urban areas.

### 30. ROUND TABLE / PANEL DISCUSSION

Urban Biodiversity Panel

### 31. SPAWNING TIME OF GIANT SEA BASS

Larry G. Allen<sup>1</sup>, Elizabeth H. Burns<sup>1</sup>, Michael P. Franklin<sup>1</sup>

<sup>1</sup> Department of Biology, California State University Northridge

Corresponding Author: Larry G. Allen, Department of Biology, California State University Northridge  
(larry.allen@csun.edu)

The Giant Sea Bass (GSB), *Stereolepis gigas*, is the largest marine bony fish on rocky reefs off the coast of California. It is the apex predator of the California kelp forests and is currently classified as critically endangered by IUCN Red List. Despite its important role in our marine ecosystems in California, a large part of its behaviors and reproductive processes were unknown. Previous studies have shown GSB capable of producing a variety of sounds (many sounding like a “boom”). In the summer of 2019 multiple successful spawning events in captivity discovered that GSB produce specific “long burst” sounds associated with spawning. Using the descriptions of these spawning sounds from captive adults recorded in 2019, we examined continuously recorded audio samples gathered in the summers of 2014 and 2015 from GSB aggregations at two sites off the coast of Santa Catalina Island, CA to document the presence, quantity, and timing of the long burst spawning sounds in the wild. We found that significantly more long bursts (up to 3X higher) occurred from 19:00 to 21:00 thus supporting the hypothesis of GSB active spawning just before and during dusk in the wild. Furthermore, these GSB spawning sounds, first recorded in captivity, can identify wild GSB spawning times, activities, and locations.

### 32. EVOLUTION OF LARVAL FISH IN A WARMING OCEAN

Darren Johnson<sup>1</sup>, Callyn Shelley<sup>1</sup>, Emma Siegfried<sup>1</sup>, Alexis Lundquist<sup>1</sup>, Thea Cole<sup>1</sup>

<sup>1</sup> Department of Biological Sciences, California State University Long Beach

Corresponding Author: Darren Johnson, Department of Biological Sciences, California State University Long Beach  
(darren.johnson@csulb.edu)

Understanding how populations may evolve with ocean warming is a challenge because organisms typically exhibit a high degree of plasticity in their responses to temperature. Such variable responses can be described by a thermal reaction norm – a function relating temperature to the phenotype expressed by a genotype. Reaction norms are useful for describing the thermal niche of a population, but reaction norms may also vary among individuals, and any consideration of long-term responses to ocean warming will need to consider genetic variation. In a case study of California Grunion, we combined controlled breeding experiments with manipulation of water temperature to evaluate genetic variation in thermal reaction norms of larval growth and mortality. We detected significant effects of genotype, temperature, and the genotype-by-temperature interaction on both growth and mortality rates. Our results suggest an appreciable amount of genetic variation along a specialist-generalist axis, and a substantial amount of variation along an axis that is consistent with overall variation in energy acquisition or allocation. Our results suggest that a complex interaction between temperature fluctuations and variable reaction norms may affect evolutionary responses in a warming ocean. Evolution in response to ocean warming may be facilitated by genetic variation in energy acquisition/allocation, but slowed by thermal specialization within the population at large.

### 33. POPULATION ECOLOGY OF UNDARIA IN DANA POINT HARBOR

Rachel Le<sup>1</sup>, Jayson R. Smith<sup>1</sup>

<sup>1</sup> Biological Sciences Department, California State Polytechnic University, Pomona

Corresponding Author: Rachel Le, Biological Sciences Department, California State Polytechnic University, Pomona (rachel@cpp.edu)

Biological invasions are a threat to coastal marine ecosystems worldwide. The annual kelp, *Undaria pinnatifida*, also known as wakame, is a global invader native to NE Asia. Despite being present in CA harbors since 2000, it was first seen in Dana Point Harbor (DPH) in 2023. Given that *Undaria* is a new invader in DPH, it is important to understand its ecology to assess management options and impacts on the native community. To examine the demography and phenology of *Undaria*, we conducted biweekly surveys for one year, recording length, life stage, and reproductivity on floating docks. To determine the distribution in the harbor, we performed a rapid assessment during its approximate peak abundance. The role of *Undaria* as a habitat former and contributor to the food web were also explored. Despite being uncommon in the previous two years, *Undaria* was abundant in 2025, though limited to certain locations and periods. Peaks in abundance occurred in spring but declined in early summer. Juveniles were present over the year, suggesting that this population may have multiple cohorts over a year rather than exhibiting its typical annual cycle. The most common native herbivore in DPH preferentially consumed *Undaria* over a native kelp implying an important role in the food web. *Undaria* hosted a very different and less diverse community than the native kelp. Patterns observed suggest management of *Undaria* in DPH may be challenging.

#### 34. HUMAN TRAMPLING IMPACTS ON TWO SEA ANEMONE SPECIES

Sandra C. Dansereau<sup>1</sup>, Dr. Jayson Smith<sup>1</sup>

<sup>1</sup> Department of Biological Sciences, California State Polytechnic University, Pomona

Corresponding Author: Sandra C. Dansereau, Department of Biological Sciences, California State Polytechnic University, Pomona (scdansereau@cpp.edu)

In urbanized areas, rocky intertidal habitats are heavily used for recreational and educational purposes. Visitor activities, such as collecting and trampling, can harm intertidal organisms and alter normal ecosystem functioning. Foot traffic has been shown to dislodge or crush intertidal species, including ecologically important rockweeds and mussels, reducing cover, biomass, size, and reproductive capacity. However, trampling effects on rocky intertidal anemones were unknown, despite being abundant and ecologically important. To experimentally examine the effects of trampling on two sea anemone species, *Anthopleura elegantissima* and *A. sola*, we established fixed plots in a randomized block design at Royal Palms in southern California. Plots within each block (n=5) for each species were assigned one of three trampling treatments, consisting of walking on fixed plots evenly once per month for one year (Dec 2024 – 2025): *A. elegantissima* treatments consisted of 0 (control), 36, and 72 steps in small plots (0.09m<sup>2</sup>), while *A. sola* treatments were 0, 150, and 300 steps in larger plots (0.35m<sup>2</sup>). Before trampling, anemone abundance and community composition were recorded. Both anemone species were resistant to trampling with no significant changes in abundances over time. Results suggest that visitor impacts on anemones are minimal and that management of visitor use should focus on other susceptible taxa.

#### 35. HOW STUDYING LARVAL FISH CAN IMPROVE FOOD SECURITY

Natalie Shubin<sup>1</sup>, Daniel Pondella<sup>2</sup>, Marty Valdez<sup>2</sup>, Bri Goodwin<sup>3</sup>

<sup>1</sup> Biological Sciences Department, Cal Poly Pomona

<sup>2</sup> Vantuna Research Group, Occidental College

<sup>3</sup> Strategic Earth Consulting

Corresponding Author: Natalie Shubin, Biological Sciences Department, Cal Poly Pomona (npshubin@outlook.com)

The Southern California Bight borders the largest urban area on the United States west coast, with high densities of disadvantaged communities who directly access marine resources for subsistence fishing. Despite intense anthropogenic pressures and heavy commercial and recreational use, these nearshore resources are relatively understudied with respect to subsistence fisheries. Pier angler surveys using multilingual assessment tools will document target species, catch expectations, perceptions of historical change, reliance on catch for food security, and concerns about environmental quality. This project will engage anglers who fish from local piers to identify general opinions and prominent concerns about nearshore fishes they access and describe trends in these assemblages and individual taxa over the past half-century. We will use a monthly 52-year nearshore ichthyoplankton dataset, collected by the Vantuna Research Group at Occidental College, to evaluate long term changes in these fish communities and their implications for food security. We will quantify the temporal relationships between larval fish densities and adult stocks targeted by subsistence anglers and evaluate how variability in larval assemblages and focal taxa are associated. In the context of taxa being accessed by subsistence fishers, we will determine whether these resources are increasing or decreasing over the last half century, and the role of oceanographic variation and fishery regulations.

### 36. RESILIENT RESTORATION: TEMPORAL GENETIC STABILITY OF ZOSTERA MARINA

Alec J. Lamond<sup>1</sup>, Ryan P. Walter<sup>1</sup>

<sup>1</sup> Biological Sciences Department, California State University Fullerton

Corresponding Author: Alec J. Lamond, Biological Sciences Department, California State University Fullerton (alamond13@csu.fullerton.edu)

Genetic variation provides the architecture for adaptation to environmental changes, but differential survival, reproduction, and evolutionary forces can induce fluctuations in genetic diversity over time. In this study, we estimated temporal genetic stability over scales of one to two years for six restored beds of the foundation species *Zostera marina* in Upper Newport Bay, California. Varying levels of temporal instability were found for all sites using allelic richness and genetic dissimilarity metrics, with elevated among-year variation for 2023 vs. 2024 comparisons. Interestingly, *Z. marina* abundance estimates, from annual survey data, show large decreases in shoot counts from 2023 surveys compared to other years, which may account for this temporal variation. Our findings indicate the value of temporal genetic data for monitoring annual changes in *Z. marina* gene pools, and may provide an important indicator of bed persistence and restoration success

### 37. FINE-SCALE GENETIC STRUCTURE AND DISPERSAL IN ZOSTERA MARINA

Ryan P Walter<sup>1</sup>, Nathalie Carrillo Munoz<sup>2</sup>

<sup>1</sup> Biological Sciences, California State University Fullerton

<sup>2</sup> Environmental Studies, California State University Fullerton

Corresponding Author: Ryan P Walter, Biological Sciences, California State University Fullerton (rwalter@fullerton.edu)

Eelgrass (*Zostera marina*) is an important coastal foundation species. Recent published work from New England Atlantic populations indicates smaller scales (tens to hundreds of meters) similar to terrestrial seed dispersal rather than larger scales of marine propagules. Here we use polymorphic population genetic markers to detect fine-scale genetic structure and relatedness in six restored *Z. marina* beds in Upper Newport Bay, California. Over 80% of beds showed elevated relatedness among individuals, with the lower estimates for sites that required additional *Z. marina* in years since construction. Our findings are consistent with natural reproduction among individuals at the majority of restored sites, suggesting that the bulk of restored beds may be self-sustaining. Spatial autocorrelation analyses at a scale of meters indicated genetic similarity among individual plants up to a distance of 15 m, with a ~13.75m patch size. Our findings support recent estimates of *Zostera* dispersal from Atlantic sites, and are also of particular importance to conservation and restoration design and management providing an indicator of *Z. marina* persistence following restoration in the urban seascape.

## 38. SNACKS FOR PRICKLEBACKS: GENOMES TO MICROBIOMES

Joseph Heras<sup>1</sup>

<sup>1</sup> Department of Biology, California State University, San Bernardino

Corresponding Author: Joseph Heras, Department of Biology, California State University, San Bernardino (JOSEPH.HERAS@CSUSB.EDU)

Marine intertidal pricklebacks (family *Stichaeidae*) exhibit remarkable dietary diversity, including carnivory, omnivory, herbivory, and ontogenetic dietary shifts, alongside repeated invasions of intertidal habitats. Previous work has documented interspecific variation in digestive physiology, including differences in gut length, enzymatic activity, and microbial fermentation. We expand on this foundation by sequencing and assembling multiple stichaeid genomes and conducting comparative genomic and gut microbiome analyses across species representing divergent dietary strategies. Using newly generated whole-genome sequences, we identified orthologous gene clusters, annotated functional pathways, and estimated patterns of molecular evolution to investigate genomic correlates of dietary specialization. To assess the role of gut microbiomes in supporting dietary strategies, we conducted controlled feeding trials during the summers of 2022 and 2024 through the REU-Blinks program at Friday Harbor Laboratories, University of Washington. Multiple species were maintained on a standardized high-protein diet for four weeks, after which gut microbiomes were extracted and sequenced to characterize microbial community composition and functional potential. Together, these analyses reveal how genetics and gut microbes shape dietary specialization in pricklebacks.

## 39. EFFECTS OF FOOD AVAILABILITY ON THE DIET OF A FISH

Jade A. Zounes Lee<sup>1</sup>, Mark A. Steele<sup>2</sup>

<sup>1</sup> Biology Department, California State University, Northridge

<sup>2</sup> Mark A. Steele

Corresponding Author: Jade A. Zounes Lee, Biology Department, California State University, Northridge (JADE.ZOUNES.385@MY.CSUN.EDU)

Spatial variation has been recognized as an important component in ecological processes. Differences in the abundance of vegetation across locations are an obvious example of such spatial variation, yet in temperate marine environments, little is known about how this variation influences the diet of animals. Nearshore reefs at Santa Catalina Island support diverse macroalgal communities of varying abundances, providing an ideal system to explore these patterns. In this study, we evaluate the diet of the opaleye (*Girella nigricans*), a common grazer, and whether its diet reflects its local macroalgal abundance. At nine locations along the leeward side of the island, we quantified the biomass of five common macroalgal species using underwater transects and collected six individuals of opaleye per location for gut content analysis. The gut contents of opaleye indicate that this fish consumes a variety of algae, with *Macrocystis pyrifera* being the most frequently eaten, while bryozoans and hydroids also as a large portion of the diet. Across locations, however, we found no significant relationship between diet composition and local macroalgal abundance, suggesting that opaleye may exhibit selective feeding, or that other ecological factors, such as the epifaunal communities associated with macroalgae, influence dietary selection. These findings will help clarify the ecological role of opaleye and improve predictions of its response to environmental change.

## 40. SOUTHERN CALIFORNIA BAR-BUILT ESTUARIES

Mark H. Capelli<sup>1</sup>

<sup>1</sup> National Marine Fisheries Service

Corresponding Author: Mark H. Capelli, National Marine Fisheries Service (mark.capelli@noaa.gov)

The rivers and streams of southern California terminate at the ocean with bar-built estuaries that are frequently isolated from upstream flows and regular tidal influences for a majority of the year. These brackish water environments provide rearing habitat for juvenile steelhead (*Oncorhynchus mykiss*) before emigrating to the ocean as smolts. Studies have demonstrated the potential accelerated growth of rearing juvenile steelhead in bar-built estuaries generally exceeds the growth rate of individuals rearing in upstream freshwater habitats. Accelerated growth may allow fish to reach a smolting stage in shorter periods and achieve a larger size at the time of emigration to the ocean. Accelerated growth rate and larger size convey a competitive advantage to bar-built rearing individuals, increasing their survival and growth rate in the marine environment, and thus contributing to their success in returning to freshwater habitats to spawn. Developments in coastal watersheds of southern California have reduced the size and physical complexity of bar-built estuaries, altered water quality, and modified the natural breaching patterns of bar-built estuaries, and therefore their overall estuarine functions. Additional research is necessary to better understand how estuarine functions differ in large and small bar-built estuaries along the southern California coast. Research on estuaries along the southern California coast would facilitate the recovery of this endangered species.

#### 41. LEAF IT TO THE SEA HARES: HOW EELGRASS SHAPES GROWTH REGULATION IN *PHYLLAPLYSIA* TAYLORI

Emma Dudley<sup>1</sup>, Scott Applebaum<sup>2</sup>, Richelle Tanner<sup>3</sup>

<sup>1</sup> Biological Sciences Department, Chapman University

<sup>2</sup> Environmental Studies Program, University of Southern California

<sup>3</sup> Environmental Science and Policy Department, Chapman University

Corresponding Author: Emma Dudley, Biological Sciences Department, Chapman University (edudley@chapman.edu)

Eelgrass (*Zostera marina*) meadows are ecologically important for carbon sequestration, nursery habitats for fisheries, and wave attenuation. There is substantial leaf size variability across its range, with Southern California leaves at ~2 mm in width and Northern phenotypes reaching up to 11 mm. Invertebrate epiphytic grazers are known for their ability to clean eelgrass leaves, allowing for efficient photosynthesis and supporting healthy meadows. Notably, the eelgrass sea hare (*Phyllaplysia taylori*) is the most efficient epiphytic grazer with an adult body size mirroring the leaf size variability, presumably maximizing use of the seagrass habitat. How the body size of the sea hares is adjusting plasticly to eelgrass leaf size is unknown. Additionally, there is a lack of research on the mechanisms behind invertebrate growth. Sea hares from Southern California (Cabrillo Beach, CA) and Northern (San Juan Islands, WA) populations living on thin and thick leaves, respectively, were analyzed to determine how substrate limitation impacted the regulation and growth to their corresponding body size. Real-time PCR assays for the expression of genes with roles as regulatory signals for growth, structures responsible for protein biosynthesis, and active in protein turnover were conducted. This study informs evolutionary questions about how species interactions can drive individual trait adaptation, potentially facilitating specialization or speciation at range ends.

#### 42. BORROWING WILD BROODSTOCK TO RESTORE GREEN ABALONE

Nancy Caruso<sup>1</sup>

<sup>1</sup> Get Inspired

Corresponding Author: Nancy Caruso, Marine Biologist, Get Inspired (nancy@getinspiredinc.org)

Abalone populations worldwide are in crisis, with nearly a third of species listed as endangered or critically endangered. Restoration of species, in the wild has become imperative. However, the collection of rare or hard-to-find individuals from wild populations for use as broodstock presents critical challenges. Removing reproductively capable individuals from natural habitats may further reduce limited reproductive potential and introduce new ecological risks. In addition, maintaining wild abalone in captivity is logistically complex and costly. Limitations in husbandry knowledge can result in high mortality rates, undermining or even destroying conservation objectives even when efforts are made with good intent.

Here, we describe a successful approach to restoration in which green abalone (*Haliotis fulgens*) were temporarily

collected from the wild in 2020, for induced spawning and returned to their original locations on the reef with minimal injury and no observed post-release mortality. Furthermore, many offspring survived and were outplanted in 2025. This method demonstrates the potential for a new abalone restoration method as an alternative to permanent broodstock collection to preserve remaining wild populations for observation and continue wild reproduction.

#### 43. USING DETECTION DOGS TO MONITOR FOR PISMO CLAMS

Sara Fangton<sup>1</sup>, Heidi Bencin<sup>1</sup>, Nancy L. Caruso<sup>2</sup>

<sup>1</sup> Atlas Ecological

<sup>2</sup> Get Inspired

Corresponding Author: Sara Fangton, biologist, Atlas Ecological (sarafangton@gmail.com)

Conservation detection dogs are increasingly used worldwide to support wildlife research, invasive species management, and restoration efforts, yet their application to marine invertebrate monitoring remains largely unexplored. Atlas Ecological is embarking on a novel project using conservation detection dogs to locate Pismo clams (*Tivela stultorum*) in dynamic coastal environments as a complementary tool for population monitoring.

Working in partnership with the non-profit Get Inspired, we are training detection dogs to locate buried Pismo clams. Current Pismo clam survey methods are effective but labor-intensive, slow, and reliant on volunteer effort. Detection dogs have the potential to improve survey efficiency by identifying areas of clam presence or absence prior to manual searching, allowing volunteers and researchers to focus effort where it is most impactful. Dogs may also provide insight on nascent populations, as the current raking method often does not detect clams under 1" in diameter.

This is an ongoing project. Preliminary training results demonstrate that dogs can successfully detect Pismo clams under realistic field conditions. Next steps of the project aim to publish a proof of concept and obtain funding to further research efforts. Future directions include expanding the dog's scent repertoire to other marine species of concern, as well as utilizing the dogs to assist in disease management in aquaponic systems.

#### 44. USING BIOLOGGING TAGS AND HIDDEN MARKOV MODELS TO ANALYZE JUVENILE WHITE SHARK BEHAVIORAL STATES

Kylie Rios<sup>1</sup>, Christopher Lowe<sup>1</sup>, Connor White<sup>1</sup>, Ryan Logan<sup>1</sup>, Emily Meese<sup>1</sup>, Echelle Burns Shark Lab<sup>1</sup>

<sup>1</sup> Shark Lab, California State University Long Beach

Corresponding Author: Kylie Rios, Shark Lab, California State University Long Beach (kylrierios27@gmail.com)

The development of biologging tags has enhanced our ability to analyze high resolution movement patterns of sharks. Biologging tags were deployed on three juvenile white sharks (JWS), *Carcharodon carcharias*, aggregating off the coast of Long Beach in May 2017 for durations of 12-24 hrs to record depth and temperature (1 Hz) and heading, tail beat period, tail beat amplitude, and acceleration (30 Hz). Tail beat frequency (TBF) and mean resultant length (R), also described as tortuosity, was calculated and a relationship was constructed via a 3-state Hidden Markov Model (HMM). Behavioral states are proposed as patrolling (TBF ~ 0.8 Hz, R < 1), travel (TBF ~ 0.7 Hz, R ~ 0), and rest/area restricted search (ARS) (TBF ~ 0.6 Hz, R = 1). Traveling occurred closer to dawn and dusk while patrolling occurred during midday. Based on state probability and its correspondence to angular speed, two sharks appeared to be conducting clockwise-counterclockwise directional behavior during the time spent in the rest/ARS state most often seen during dawn/dusk hours. The time spent in each behavior state varied for all 3 sharks with JWS 08 spending 12.6 hrs patrolling, JWS 09 spending 15.0 hrs resting/exhibiting ARS, and JWS 11 spending 17.5 hrs traveling. White sharks may be utilizing time in aggregation sites differently based on individual energetic needs.

#### 45. REPRODUCTIVE RESPONSES TO UNPREDICTABLE HEAT EXTREMES ACROSS THE RANGE OF PHYLLAPLYSIA TAYLORI

Emily Aghajani<sup>1</sup>, Jayson Leem<sup>2</sup>, Sandy Wyllie-Echeverria<sup>2</sup>, Richelle Tanner<sup>1</sup>

<sup>1</sup> Environmental Science and Policy, Chapman University

<sup>2</sup> Friday Harbor Laboratories, University of Washington

Corresponding Author: Emily Aghajani, Environmental Science and Policy, Chapman University  
(emilyaghajani@gmail.com)

*Phyllaplysia taylori* and *Zostera marina* have a beneficial relationship, in which *P. taylori* grazes excess epiphytes that restrict *Z. marina* from sun exposure, promoting photosynthesis. This relationship maintains healthy *Z. marina* meadows, enhances nursery habitat, attenuates wave action, and sequesters carbon. However, this ecosystem is being impacted by heat extremes. We focused on the effects of stochastic heat extremes on *P. taylori* reproduction near their range ends: Southern California and the San Juan Islands, where locales differ in phenotypic traits. Alongside a static control treatment at 15°C (Cabrillo Beach, CA) and 13°C (Friday Harbor, WA), four treatments of heat stress at local maxima of 27°C (Cabrillo) and 25°C (Friday Harbor) were created to replicate the natural occurrence of heatwaves in a fully crossed design differing in frequency (weekly and every other day) and duration (30 and 90 mins). We found that Friday Harbor *P. taylori* were more fecund (n=314 egg masses) than Cabrillo (n=34). They also produced larger egg masses regardless of the heat stress treatment. Offspring quality in both locales decreased with unpredictable heat extremes, leading to non-viable offspring. *P. taylori* from the northern range limit produces more and higher-quality offspring, suggesting that as heat stress intensifies, the population could maintain higher abundance and genetic diversity, increasing its climate resilience.

#### 46. HEAT AND FOOD STRESS AFFECTS MUSSEL BIOCHEMISTRY

Claribel Y. Alcantar<sup>1</sup>, M. C. Vasquez<sup>2</sup>, Bengt J. Allen<sup>1</sup>

<sup>1</sup> Department of Biological Sciences, California State University, Long Beach

<sup>2</sup> Biology Department, Loyola Marymount University

Corresponding Author: Claribel Y. Alcantar, Department of Biological Sciences, California State University, Long Beach (claribel.alcantar01@student.csulb.edu)

Aerial exposure during low tides increases the risk of thermal and desiccation stress and reduces food availability for marine intertidal organisms. Many individuals rely on physiological acclimation to mitigate potential negative effects of fluctuating conditions; however, activating and sustaining such defenses is energetically expensive. We investigated the interactive effects of temperature variation and food availability on the cellular stress response and associated thermal tolerance of the California mussel, *Mytilus californianus*. Mussels were randomly assigned to one of six fully factorial treatments combining body temperature variability (low, moderate, or high) and food ration (low or high) for four weeks, followed by a simulated 5-day heat wave (daily exposure to 33°C, 36°C, or 39°C). Survival was recorded daily during the initial experimental period and biochemical responses (heat-shock protein abundance and metabolic enzyme activity) quantified after one and four weeks of acclimation. High temperature variability led to reduced biochemical responses and survival over the four weeks; however, differences in food ration alone did not. During the simulated heat wave, mussels acclimated to moderate temperature variability and high food availability exhibited the largest biochemical response and survived the best. Our results provide insight into the underlying physiological mechanisms governing observed patterns of survival and growth in the field.

#### 47. PREDICTING POPULATION-LEVEL CONSEQUENCES OF THERMAL STRESS WITH INTEGRAL PROJECTION MODELS (IPMS)

Alexis Coddling<sup>1</sup>, Bengt Allen<sup>1</sup>

<sup>1</sup> Biological Sciences Department, California State University, Long Beach

Corresponding Author: Alexis Coddling, Biological Sciences Department, California State University, Long Beach (alexis.coddling@student.csulb.edu)

Following exposure to sublethal high temperatures, many organisms undergo physiological changes that enhance their tolerance to subsequent thermal stress. While this acclimation may buffer survival, it can be energetically costly, potentially reducing growth and/or reproduction due to allocation trade-offs among competing life-history traits. Understanding how these trade-offs scale from individual performance to population-level outcomes remains a key question for ecologists. Using rocky intertidal mussels (*Mytilus californianus*) as a focal species, we developed an integral projection model (IPM) to evaluate the demographic consequences of temperature-induced trade-offs between survival and other life-history traits (e.g., growth and reproduction). Temperature-dependent effects on growth and reproduction were incorporated using published empirical data, while survival was held constant. IPM outputs suggest that reductions in growth and reproduction can alter population growth rate, stable size structure, and reproductive values in predictable ways. These dynamics are driven primarily by large adult mussels. By modeling the demographic consequences of life-history trade-offs, this study links individual-level responses to population-level outcomes and provides insight into the mechanisms that support persistence under sublethal thermal stress.

#### 48. TWITCH AS A PLATFORM FOR SCIENCE COMMUNICATION

Todd R. Clardy<sup>1</sup>, Balint Kacsoh<sup>2</sup>, Lita Kacsoh<sup>2</sup>

<sup>1</sup> Department of Ichthyology, Natural History Museum of Los Angeles County

<sup>2</sup> SciAnts Media

Corresponding Author: Todd R. Clardy, Department of Ichthyology, Natural History Museum of Los Angeles County (tclardy@nhm.org)

The social media website Twitch.tv has its origins as a platform for facilitating live streams of video games. In recent years, the platform has expanded to include live streams of many additional topics and currently has between 140-240 million monthly active users, including both viewers and live streamers. An important and growing category on Twitch is the Science & Technology category, with channels dedicated to a wide range of science topics, such as paleontology, space exploration, conservation biology, engineering, and more. Twitch has several advantages as a science communication platform, including zero cost of entry for viewers and live streamers, built-in social connectivity and moderation tools, and the ability to integrate easily with other social media platforms. These tools allow scientists to make science more transparent and approachable to the public by engaging in actual science activities, including microscopy, field work, data analysis, interviews with scientists, manuscript discussion, and more. Here, we discuss features that make Twitch an attractive platform for science communication, highlight streamers who are using the platform effectively, and provide tips for using Twitch as a platform for science communication.

#### 49. ILLUSTRATING THE DIG: VISUAL METHODS FOR DOCUMENTATION AND COMMUNICATION (BEFORE, DURING, AND AFTER)

Stephanie Abramowicz<sup>1</sup>

<sup>1</sup> Research & Collections, Natural History Museum of Los Angeles County

Corresponding Author: Stephanie Abramowicz, Research & Collections, Natural History Museum of Los Angeles County (sabramow@nhm.org)

Fossil excavation is a destructive event. Once a fossil is removed, it's position in the rock, and it's relationship to nearby bones and sediments cannot be re-created. Effective visual documentation and scientific illustration are critical tools for preserving that context and making it useful and accessible to scientists, museums and the public. I will show how visuals support every stage of the dig, before excavation and beyond.

#### 50. CO-CREATION AND COMMUNICATION IN CONSERVATION

Christine Wilkinson<sup>1</sup>

<sup>1</sup> Research & Collections Department, Natural History Museum of Los Angeles County

Corresponding Author: Christine Wilkinson, Research & Collections Department, Natural History Museum of Los Angeles County (cwilkinson@nhm.org)

Scientific research does not exist in isolation—it both shapes and is shaped by the communities and landscapes it seeks to understand. This talk explores how working iteratively between research and relationships connects science, outreach, and policy toward more just environmental outcomes, particularly in urban landscapes where conservation decisions intersect with everyday social and environmental realities. Drawing from work in urban and peri-urban spaces across California and East Africa, I show how studies of human–wildlife interactions can support community knowledge production and inform decision-making. From tracking urban carnivores to co-creating monitoring programs, these projects demonstrate that conservation science is most effective when grounded in the lived experience of local communities. I also reflect on my unexpected trajectory from researcher to science communicator and policy collaborator, highlighting science communication as a core scientific practice through public talks, television, radio, podcasts, workshops, and other multimedia outreach efforts that translate research across audiences. Centering environmental justice in conservation science requires rethinking participation in science, whose knowledge counts, and how evidence becomes meaningful action. In our rapidly changing world, conservation succeeds not only through data, but through sustained relationships, meaningful outreach, and community-driven science.

## 51. SEA THE WORLD: PRESENTING SCIENCE AT SEAWORLD

Phillip Sternes<sup>1</sup>

<sup>1</sup> Education and Conservation Department, SeaWorld San Diego

Corresponding Author: Phillip Sternes, Education and Conservation Department, SeaWorld San Diego (philsternes77@gmail.com)

Science outreach is becoming increasingly critical in times of mass information availability and continuously updated on a daily basis. Outreach can inform the public of critical information on both global and local issues. SeaWorld has been a leading institution on educational outreach and conservation for over 60 years. Its Education and Conservation Department has a goal to connect and inform the general public of the life history and conservation information on every animal in the park. The program has continued to undergo overhauls in recent years due to increasing biological information from both research from within SeaWorld and from the broader scientific community. However, in an increasingly digital age and lower occupant time in animal areas, educators are being forced to adapt narrations. These new narrations must hit several critical facts to engage with the public.

## 52. TELLING YOUR CONSERVATION OR COMMUNITY SCIENCE STORY WITH LIMITED RESOURCES USING SCI-COMM

Moses Aubrey<sup>1</sup>

<sup>1</sup> Community Science Department, Natural History Museum of Los Angeles County

Corresponding Author: Moses Aubrey, Community Science Department, Natural History Museum of Los Angeles County (MAUBREY@NHM.ORG)

This presentation will discuss the value of sharing stories of local species and conservation efforts with the general public to encourage participation in community science and how to work with the public in our urban landscape. There is no shortage of wildlife stories in our cities. Living in Urban Los Angeles and working as a wildlife filmmaker and photographer, I have many weekly encounters with the public, and in those encounters, the one constant that everyone shares is the fact that everyone has a story about wildlife, whether that is a positive or negative one. Every person I talked to was passionate and usually curious and wanted to learn more. Working towards educating the public about wildlife and conservation is what we will discuss. How to find those stories using community science tools and projects already available to us, and how we can help share stories of the research that we are all doing. We may not all have

access to the fanciest equipment, but your smartphone and other tools that you have readily available to you can be used to tell compelling stories. This will not only make us better science communicators but can also have the added benefit of encouraging the public to get involved in the community science efforts we are all working towards through storytelling.

### 53. HOW TO SHARE YOUR WORK: TIPS FROM A REPORTER

Lila Seidman<sup>1</sup>

<sup>1</sup> Science Reporter, Los Angeles Times

Corresponding Author: Lila Seidman, Science Reporter, Los Angeles Times (lila.seidman@latimes.com)

A big part of my job as a reporter for the Los Angeles Times is translating complex information into clear, engaging language for a general audience. That has been especially true during my past two years covering wildlife and the outdoors for the paper's environment team.

Many of my sources are scientists who want to share their research or perspective on a topic but may struggle to communicate it in ways that resonate beyond their field. This presentation offers practical tips, from a journalist's perspective, on how to share scientific work in a way that's compelling and comprehensible to a lay audience.

A key step is dropping jargon. For some scientists, technical language can feel precise and necessary, but it often obscures meaning for non-experts. The most effective way to preserve accuracy is to explain concepts in the simplest terms possible from the get-go.

Another important element is identifying a clear hook or angle that will draw people in — whether through human stakes, timely issues, riveting storytelling or surprising takeaways.

These are just a few strategies that can help scientists communicate more clearly, connect with the public and expand the reach of their work; the presentation will cover additional pointers.

### 54. ROUND TABLE / PANEL DISCUSSION

Science Communication Panel

### 55. GOT WATER? COMBINED EFFECTS OF HEAT AND DROUGHT ON COASTAL SAGE SCRUB SPECIES SALVIA LEUCOPHYLLA

Andrew Levy<sup>1</sup>, Jaymes Griggs<sup>1</sup>, Zane Wilson<sup>1</sup>, Milan Coleman<sup>1</sup>, Alexandria Pivovarovff<sup>1</sup>

<sup>1</sup> Biology Department, Occidental College

Corresponding Author: Alexandria Pivovarovff, Biology Department, Occidental College (pivovarovff@oxy.edu)

Anthropogenic climate change threatens ecosystems worldwide as increasing drought and heat intensify plant physiological stress. Drought and heat are major drivers of plant mortality, so understanding plant tolerance to both is critical for predicting plant responses to future climate conditions. Moreover, Southern California's coastal sage scrub (CSS) habitat is a threatened plant community type, with less than 10% of the original community still in existence. Our research focused on the drought-deciduous/seasonally dimorphic CSS species *Salvia leucophylla* (purple sage). We asked, How does drought affect *S. leucophylla*'s ability to tolerate and recover from heat waves? To test this, subjected half our plants to a control (well-watered) treatment and half our plants to a drought treatment. All plants were then subjected to a series of 3-day heat waves, using a plant growth chamber to maintain air temperature to 35C. We measured stomatal conductance, chlorophyll content, and Fv/Fm before, during, and after each heat wave. While both watered and droughted plants exhibited little to no stomatal conductance during heat waves, watered plants exhibited a quicker recovery with significantly higher stomatal conductance than droughted plants post-heat wave. These results

demonstrated that the dual stress of drought and acute heat could significantly impact this threatened habitat.

## 56. COOL ISLANDS, HOT LIZARDS: CHARACTERIZING THE THERMAL BIOLOGY OF AN INSULAR ENDEMIC

Eva E. Greco<sup>1</sup>, Robert E. Espinoza<sup>1</sup>

<sup>1</sup> Department of Biology, California State University, Northridge

Corresponding Author: Eva E. Greco, Department of Biology, California State University, Northridge (eva.greco.988@my.csun.edu)

Temperature constrains the biology of ectotherms, influencing where they live, when they are active, and how they interact with their environments. Understanding how ectotherms persist across climatic gradients is critical, particularly in the context of insular systems and predicted climate change. The Northern Channel Islands are substantially cooler than coastal SoCal, presenting a potential thermal challenge for endemic Island Fence Lizards, sister taxon of thermophilic Western Fence Lizards. We tested whether island populations have evolutionarily shifted their thermal biology or persist via behavioral and temporal adjustments. We compared seven thermal metrics among island and continental populations. Field and selected body temperatures and panting thresholds did not differ among populations, suggesting conservation of core thermal traits. However, thermal minima varied seasonally, suggesting temporal plasticity in cold tolerances. Our findings suggest island and continental fence lizards differ less in thermal preferences than in the quantity and quality of thermally suitable conditions they experience on a daily and seasonal basis. Ongoing analyses of operative temperatures and thermoregulatory efficiency will quantify how cooler island climates shape activity windows and performance. Our study offers a synthetic understanding of how insular reptiles adapt to cooler climates and manage this island endemic under climate warming.

## 57. EVOLUTIONARY EFFECTS OF CLIMATE ON COMPETITION

Alex A. Mendelson<sup>1</sup>, Casey P. terHorst<sup>1</sup>

<sup>1</sup> Department of Biology, California State University Northridge

Corresponding Author: Alex A. Mendelson, Department of Biology, California State University Northridge (alex.mendelson.698@my.csun.edu)

In response to acute changes in climate, populations that cannot move must adapt. Novel adaptive traits to new environmental conditions likely indirectly affect interactions with other species. While these evolution-mediated indirect effects of climate on ecology are potentially important for the trajectory of natural communities, few workers have observed such effects in an empirical setting. To investigate these effects experimentally, I used the purple pitcher plant (*Sarracenia purpurea*) leaf water inquilin community as a study system. The water-filled pitchers of *S. purpurea* host a variety of organisms across multiple trophic levels, including the obligately parthenogenetic rotifer *Habrotrocha rosa* and their natural competitors: ciliates (*Tetrahymena* sp.). I isolated clones of *H. rosa* from field samples of leaf water and observed that clones differed in their response to temperature, indicating the potential for rapid evolution. Using a mixture of clones, I allowed diverse cultures of *H. rosa* to establish evolutionary lines with different histories of temperature. In a reciprocal transplant experiment, I found that rotifers with an evolutionary history of higher temperature had a lower intrinsic growth rate in the presence of competitors than rotifers with a history of moderate temperature. These results are consistent with an indirect effect of temperature on competitive ability and provide evidence of a scarcely studied theoretical prediction of evolutionary ecology.

## 58. COMPETITION DRIVES SPATIAL SEGREGATION BETWEEN TWO THREATENED RODENT SPECIES

Janine N. Straughan<sup>1</sup>, Debra M. Shier<sup>2</sup>, Gregory F. Grether<sup>1</sup>

<sup>1</sup> Ecology and Evolutionary Biology, University of California, Los Angeles

<sup>2</sup> Recovery Ecology, San Diego Zoo Wildlife Alliance

Corresponding Author: Janine N. Straughan, Ecology and Evolutionary Biology, University of California, Los Angeles (jnstraughan@gmail.com)

Interspecific competition can be an important driver of resource partitioning between ecologically similar species, but it is often difficult to disentangle effects of competition from evolved habitat preferences. Understanding how competition influences space use and activity patterns is important in the face of rapid environmental changes that constrain species' distributions and increase contact between competitors. The kangaroo rats *Dipodomys stephensi* and *D. simulans* are sympatric species of conservation concern that overlap in habitat use and compete for resources. These species partially segregate into different microhabitat types, but it was unclear whether the spatial segregation results from ongoing interspecific competition. We used a passive monitoring system along a natural habitat gradient to quantify the species' space use and activity. We quantified temporal segregation and individual-level spatial overlap and used joint species distribution modeling to test for negative species associations. We found no evidence for temporal segregation, but even after accounting for differences in habitat use, the species' spatial distributions were almost perfectly negatively correlated (approximately -0.99), indicating that interspecific competition contributes strongly to spatial segregation. These results highlight the need for conservation measures, such as translocations and habitat management, to explicitly consider both habitat requirements and species interactions.

#### 59. LINED SHORE CRABS OF AMERICAN MARSHES AND ROCKY SHORES: ONE SPECIES DIVERGED FROM THOSE IN ASIA ~1MA

James P. Heiser<sup>1</sup>, Anai Novoa<sup>1</sup>

<sup>1</sup> Scripps Institution of Oceanography

Corresponding Author: Ryan F. Hechinger, Scripps Institution of Oceanography ()

The lined shore crab, *Pachygrapsus crassipes* (Grapsidae), is a widely distributed intertidal species in the West and East Pacific, occupying wave-exposed rocky shores and calm, muddy estuarine habitats. These contrasting environments raise questions about whether estuarine and rocky-shore crabs represent distinct evolutionary lineages or a single species, and whether disjunct West and East Pacific populations arose from ancient or recent dispersal. Genetic differentiation was assessed using mt COI and nuclear 28S sequences from newly collected samples spanning 13 estuaries and 23 rocky shore sites in the East Pacific, together with previously published sequences from both coasts. Within the East Pacific, estuarine and rocky-shore populations showed no genetic separation for either marker, with shallow lineages and identical haplotypes in each habitat. This suggests high connectivity, likely driven by planktonic larval dispersal. In contrast, we confirm and bolster prior work indicating ~1 MY divergence between West and East Pacific crab populations. The West Pacific exhibits deeper genetic structure, while the East Pacific populations are genetically shallow; this raises the question of whether the ancestral range lies in the West or East Pacific. Our results clarify that *P. crassipes* is genetically cohesive across East Pacific habitats, while persistent transpacific barriers have shaped deeper evolutionary divergence between ocean basins.

#### 60. CONTINENT SURFING: THE FIRST MOLECULAR PHYLOGENY OF A GONDWANAN ISOPOD SUBORDER

William Farris<sup>1</sup>, Ethan Kahn<sup>1</sup>, Regina Wetzler<sup>1</sup>

<sup>1</sup> Marine Biodiversity Center, Natural History Museum of Los Angeles County

Corresponding Author: William Farris, Marine Biodiversity Center, Natural History Museum of Los Angeles County (wfarris@nhm.org)

Phreatoicidea is a suborder of isopods (Crustacea, Peracarida) that first appear in the fossil record and become widely distributed in marine habitats during the Carboniferous period 300-325 MYA. Today, there are 114 described extant species in 6 families that are endemic in freshwater systems, including subterranean aquifers, groundwater-fed springs, seepages, and even muddy road ruts. These extant members are restricted to geographic regions that comprised

Gondwanaland in the early Jurassic (200 MYA). Although morphological phylogenies supported a basal relationship to all other isopods, some recent molecular phylogenies instead nest Phreatoicoidea with other Isopoda. Despite their importance in understanding deeper phylogenies of Isopoda, relationships within the suborder Phreatoicoidea have not been addressed with molecular data. For instance, one morphological phylogeny proposed that *Pilbarophreatoicus* in northwestern Australia is more closely related to two Indian genera than to many other Australian Phreatoicoidea. Currently, little molecular data is available to test this claim. This project combines publicly available sequences with new 18S rRNA, 16S rRNA, and Cytochrome Oxidase 1 data from extant species to construct the most robust molecular phylogeny to date, shedding light on the origins of the current distribution. This effort provides a molecular backbone for the suborder, the first step toward understanding the isolation and radiation of a once ubiquitous taxon.

#### 61. A NEW SPECIES OF *LIGIA* (CRUSTACEA: ISOPODA) IN LOS ANGELES HARBOR BASED ON MOLECULAR DATA

Aiko Abo Dominguez<sup>1</sup>, Will Farris<sup>2</sup>, Ethan Kahn<sup>2</sup>, Jazlyn Mooney<sup>3</sup>, Regina Wetzer<sup>2</sup>

<sup>1</sup> University of Southern California; Marine Biodiversity Center, Natural History Museum of Los Angeles County

<sup>2</sup> Marine Biodiversity Center, Natural History Museum of Los Angeles County

<sup>3</sup> Department of Quantitative and Computational Biology, University of Southern California

Corresponding Author: Aiko Abo Dominguez, University of Southern California; Marine Biodiversity Center, Natural History Museum of Los Angeles County (abodomin@usc.edu)

*Ligia occidentalis*, known as the sea slater, is a common isopod found scuttling on the rocky intertidal along the US and Mexican Pacific coast, unable to cross water or travel far. Molecular phylogeographic studies of *L. occidentalis* across much of its range demonstrated extensive genetic diversity and deep divergences, however these populations are morphologically indistinguishable. Advances in statistical and molecular applications to systematics have resulted in robust novel species descriptions based on molecular characters alone, including within *Ligia*. We leveraged 235 publicly available sequences from GenBank and BOLD, along with 26 specimens from the Los Angeles Natural History Museum, representing 262 localities from Oregon to Guerrero, Mexico, to assess whether distinct species of *Ligia* could be identified. We analyzed 16S and COI sequence data using distance- and tree-based methods to investigate genetic divergence among *Ligia* populations in the Los Angeles Harbor region. We conducted phylogenetic analyses and used four molecular species delimitation approaches, including Automatic Barcode Gap Discovery and Assemble Species by Automatic Partitioning, to test whether these populations represent independent evolutionary lineages. By integrating macroevolutionary and population genetic analyses comparing Los Angeles populations with other coastal populations, we identify and distinguish a novel, previously unrecognized species.

#### 62. RNA STRUCTURE APPROACH TO THE SPHAEROMATID TREE

Ethan Kahn<sup>1</sup>, Will Farris<sup>1</sup>, Regina Wetzer<sup>1</sup>

<sup>1</sup> Marine Biodiversity Center, Natural History Museum of Los Angeles

Corresponding Author: Ethan Kahn, Marine Biodiversity Center, Natural History Museum of Los Angeles (ekahn@nhm.org)

*Sphaeromatidae* is a family of nearly 700 species of small, mostly shallow marine isopods. Its members demonstrate high morphological variability, which has contributed to a long and often conflicted taxonomic history. Previous attempts to construct molecular phylogenies have confirmed monophyly of the family and identified distinct supra-generic groupings, but were unable to resolve many deeper relationships due to extremely variable expansion regions in the otherwise slowly evolving 18S rDNA gene. Because hydrogen-bonded stem regions of the ribosomal RNA are more strongly conserved than the unbonded loop regions, sections of these variable insertions can be aligned with high confidence and preserve phylogenetic signal. With specimens at the Natural History Museum of Los Angeles, we produce more accurate alignments for 16S and 18S rDNA, by accounting for the evolutionary constraints of RNA secondary structure, and combine them with COI sequences for better resolution of a multi-locus sphaeromatid phylogeny. Hundreds of sequences are already published for these three loci, including for difficult to sample species, so

re-analysis which leverages existing data is a practical way to resolve phylogenetic relationships. We also add representatives of previously unsequenced genera, improving taxonomic coverage. Our phylogeny sets the stage for exploring the biogeography, morphological innovations, reproductive systems, and diversification of this abundant, widespread isopod family.

63. -

#### 64. MEASURING FALL RISK USING THE INTERNET-OF- THINGS FOOTBOARD

Melissa S. Lee<sup>1</sup>, Kyle Yeh<sup>2</sup>

<sup>1</sup> The Webb Schools

<sup>2</sup> Brown University

Corresponding Author: Melissa S. Lee, The Webb Schools (melissalee2390@gmail.com)

Falls are the second leading cause of unintentional death worldwide. The risk of falls can be evaluated using standardized tests such as the 30-Second Chair Stand Test (30CST). We wanted to develop a device that not only could conduct the test autonomously but also provide additional information beyond that in the traditional observer method. So we developed an Internet-of-Things (IoT) Footboard that wirelessly and automatically calculated the number of sit-stand cycles completed, the time per cycle in milliseconds, the rate of weight change during standing and sitting, the pressure applied at each footboard corner, and the time spent sitting and standing during each cycle. The device was found to be reliable and reduced the labor required to perform the 30CST. Participants did not need to wear any devices or sit in a specific position, and testing was compatible with all chairs. With the substantial amount of new information provided, physicians can more accurately evaluate fall risk and leg strength and hopefully decrease the number of falls and improve life expectancy.

#### 65. INFLUENCE OF PH ON SHELL REGENERATION IN A MARINE BIVALVE

Mischa Kreidler<sup>1</sup>

<sup>1</sup> Sage Hill School

Corresponding Author: Mischa Kreidler, Sage Hill School (Mischa.kreidler@gmail.com)

The absorption of atmospheric CO<sub>2</sub> into seawater leads to a series of chemical equilibria that include acid dissociation reactions, yielding bicarbonate and free hydrogen ions. This increase in hydrogen ions lowers the pH of the water, making it more acidic. Although seawater has some natural buffering capacity and many factors affect its chemistry, rising levels of atmospheric CO<sub>2</sub> could still change ocean pH and reduce the amount of available carbonate. These changes are referred to as ocean acidification and could be significant for marine organisms that rely on the biomineralization of carbonate minerals such as aragonite and calcite to form shells and other supporting features. To explore the influence of seawater pH upon the rate of mineralization in bivalves, a uniform hole was introduced to the shells of living northern quahog clams (*Mercenaria mercenaria*), groups of which were then maintained at three different pH treatments (8.1, 7.85, 7.7) and monitored. While some change was observed, no significant difference was found among the groups over a period of 28 days. Observations made throughout the initial investigation and final examination of the specimens highlight multiple considerations for improving the experimental design in future studies.

66. TBD

Leroy Hui<sup>1</sup>

<sup>1</sup> Trabuco Hills School

Corresponding Author: Leroy Hui, Trabuco Hills School (hui.leroy@gmail.com)

Evidence of autonomous swarm recovery in highly constrained, non-line-of-sight environments remains limited because of the lack of translation between simulated drones which are often treated as ideal and real conditions. To provide a better depiction of how drone swarms can fulfill objectives in more realistic conditions, the trade-off between safety, connectivity, longevity, and utility of a drone swarm was tested by developing an Elastic Constraint-Aware controller, simulating realistic conditions and shifting drone priorities based on conditions often not considered during simulation such as drone downdraft, connection without line-of-sight, and drone energy. To assess the efficacy of the constraint-aware controller, simulated missions were conducted in UE4/AirSim with different environments and conditions. Experiments used state-dependent dynamic weighting and  $O(n*k)$  scalability to limit drone connections to the  $k$  nearest neighbors. Data collection is still ongoing but the data analysis focuses on the Network Resilience Index and Mission Success Rate. Anticipated high NRI values especially in low-connectivity areas would indicate successful automatic connectivity relay chains between individual drones, but an NRI approaching zero would suggest the network struggles with connectivity and the need for a higher weight priority on connectivity. Furthermore, a reduction in the Smoothness Index (Jerk) would mean that the dynamic weighting is effective at reducing chatter when drones shift priority. Final data values will determine the extent of the gap between simulation/realistic conditions as well as the efficacy of a dynamic constraint-aware system.

## 67. STUDY OF THE SALT CREEK WETLAND AT THE SALTON SEA

Mackenzie Schilling<sup>1</sup>, Jerusalem Miramontes<sup>1</sup>, Dr. Barry Hibbs<sup>1</sup>

<sup>1</sup> Department of Geography, Geology, and Environment, California State University Los Angeles

Corresponding Author: Mackenzie Schilling, Department of Geography, Geology, and Environment, California State University Los Angeles (aschill4@calstatela.edu)

The Salton Sea, California's largest inland body of water, is undergoing rapid hydrologic and ecological change as water inputs diminish, salinity increases, and shorelines recede. In response to the expansion of exposed playas, wetlands are forming, contributing a vital role in dust suppression and habitat creation. Phreatic vegetation and localized freshwater flow provide refuge within an increasingly saline system. Since its creation, the Salton Sea has functioned as a critical stopover site for migratory birds and it continues to host a population of endangered desert pupfish. Though the longevity and function of these wetlands as habitat depend strongly on the source of their freshwater inputs and their respective nutrient dynamics. This study aims to determine the source of inflow and characterize nutrients (sulfate, chloride, boron, orthophosphate, nitrate, and ammonia) for the Salt Creek wetland using tritium, stable water isotopes ( $\delta^{18}\text{O}$  and  $\delta^2\text{H}$ ), and nutrient analysis. Initial results show low concentrations of nitrate, orthophosphate, and ammonia present, while the salinity of the stream is typical of dilute brackish water (2ppt). These conditions are ideal for both pupfish and a variety of bird species.  $\delta^2\text{H}-\delta^{18}\text{O}$  relationships indicate Salt Creek water represents mixing between Colorado River/Coachella Canal water and local groundwater, ~61% canal water and ~39% original groundwater. A slight displacement along a lower-slope trajectory relative to the mixing line  $i$

## 68. ISOTOPIC TRACING OF SULFATE IN THE LA RIVER

Jose Garcia<sup>1</sup>, Dr. Barry Hibbs<sup>1</sup>

<sup>1</sup> Hydrogeology Program, California State University - Los Angeles

Corresponding Author: Jose Garcia, Hydrogeology Program, California State University - Los Angeles (jgarc802@calstatela.edu)

The Los Angeles River traverses through heavily developed urban and industrial zones. Its hydrochemistry is influenced by groundwater inputs, municipal wastewater treatment effluent, and tributary waters along its course. Anions, particularly sulfate ( $\text{SO}_4^{2-}$ ) and chloride ( $\text{Cl}^-$ ), are dominant components of the river's chemistry and were analyzed from the headwaters to the river's southern limits. Sulfate concentrations ranging from 500 to 2700 mg/L have been reported in basin groundwater and surface waters and are reflected in sampled groundwater along the river corridor. Sulfate is derived in part from dissolution of secondary gypsum ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ) present within Miocene marine formations, which release substantial sulfate loads. Groundwater samples collected in this study contained sulfate concentrations between

35 and 975 mg/L, reflecting the influence of lithologic controls and dissolution reactions. Secondary gypsum dissolution was evaluated by collecting gypsum from the La Vida Shale Member, a thin-bedded, siliceous to semi-siliceous shale. The material was dissolved to quantify sulfate release and characterize its source using sulfur and oxygen stable isotopes. Using this isotope data, geologic and isotopic analyses of sulfate were conducted, along with a complementary suite of analytes including nitrogen, phosphorus, and stable water isotopes ( $\delta^{18}\text{O}$  and  $\delta^2\text{H}$ ). The full dataset indicates that natural geologic processes are a more dominant driver than anthropogenic inputs.

## 69. EFFECTS OF CLIMATE CHANGE ON ROTIFER COMPETITION

Vincent Cannizzaro<sup>1</sup>, Breana M. Morales, Alex A. Mendelson, Casey P. terHorst

<sup>1</sup> Department of Biology, California State University Northridge

Corresponding Author: Vincent Cannizzaro, Department of Biology, California State University Northridge (vincent.cannizzaro.791@my.csun.edu)

When environmental conditions change abruptly, populations that cannot relocate must evolve to survive. New, adaptive traits likely affect the way species interact with one another. We aim to investigate these evolution-mediated indirect effects by comparing resource availability and fitness between lines of pitcher plant rotifers (*Habrotrocha rosa*) with different histories of temperature (25°C and 30°C). Rotifers will be cultured in identical conditions with the exception of food availability. Treatment groups will receive a gradient of five concentrations of a natural bacteria stock, and cultured for two weeks at 25°C. During the experiment, we will measure both population size and resource availability. We will estimate the intrinsic growth rate ( $r_i$ ) of each replicate by fitting a logistic growth model to population growth curves, then use  $r_i$  as a proxy for fitness. The relationship between fitness and resource availability for each evolutionary history will be analyzed using Analysis of Covariance. We expect an interaction, indicating an indirect effect of history of temperature on competitive ability.

## 70. MICROPLASTICS IN ISLAND TERRESTRIAL MAMMALS (*UROCYON LITTORALIS SANTACRUZAE*)

Kalani Wagoner<sup>1</sup>

<sup>1</sup> ESRM, CSUCI

Corresponding Author: Diana Rodriguez, ESRM, CSUCI (diana.rodriguez513@myci.csuci.edu)

The Channel Islands is an example of how geographic isolation shapes evolution, leading to endemic species such as the Island Fox *Urocyon littoralis*. After nearing extinction in the late 1990s, the species achieved one of the fastest recoveries of any mammal listed under the Endangered Species Act. Intensive conservation actions successfully restored populations across six islands. Despite this success, Island Fox populations remain vulnerable to emerging anthropogenic threats, including plastic pollution. Microplastics persist in both terrestrial and aquatic systems, yet ecological effects on land mammals remain largely understudied. Microplastics can disrupt biological processes, raising concerns about long-term impacts on wildlife health. As an omnivorous top predator, the Santa Cruz Island fox *Urocyon littoralis santacruzae* has increased its potential exposure to both marine-derived and human-sourced plastics. This study quantified the concentration and morphology of microplastics in 55 fox scat samples collected from Santa Cruz Island in fall 2025, comparing samples by proximity to the shoreline and inferred diet composition. By distinguishing between marine and inland plastic sources, we evaluated whether human presence correlates with increased contamination in a terrestrial mammal. Using non-invasive scat analysis, this research clarifies how microplastics move through island food webs and contributes data to ongoing conservation efforts.

## 71. CORRELATION BETWEEN TIDAL STATE AND BEHAVIOR OF BOTTLENOSE DOLPHINS

Quinlynn McCarthy<sup>1</sup>

<sup>1</sup> Marine Sciences Department, Orange Coast College

Corresponding Author: Quinlynn McCarthy, Marine Sciences Department, Orange Coast College  
(quinlynnmccarthy@gmail.com)

OARRA, a monitoring and mortality response team, conducted live animal surveys of the Southern California coast from Marina Del Rey to Dana Point, during the period of 2020 to 2025. They recorded sightings of bottlenose dolphins during these surveys and the animals' observed behavior. In my research project, I compared the information from these surveys to tidal data sourced from NOAA. The comparison suggests bottlenose dolphins exhibit traveling behavior most during flood and ebb tides and feeding during flood and slack tides. OARRA uses observations made during their live animal surveys to anticipate unusual mortality events (UMEs). A correlation between dolphin behavior and tides may provide another early warning sign by establishing typical healthy behaviors.

## 72. PLANT REMEDIATION FOR RESIDENTIAL SOIL AFFECTED BY FIRE AND HEAVY METAL POLLUTION

Parker Evans<sup>1</sup>, Diana Crisostomo, Adriane Jones

<sup>1</sup>Biological Sciences, Mount Saint Mary's University

Corresponding Author: Parker Evans, Biological Sciences, Mount Saint Mary's University (parkevan@msmu.edu)

In the aftermath of a wildfire, soil often sees an increase in heavy metal pollution from burned structures. This increase in heavy metals, such as lead and arsenic, can be hazardous to residents' health, especially for those who might have gardens from which they use food. The EPA limit for lead in residential soil is 200 ppm. Following the 14,000 acres of destruction left by the Eaton fire in Los Angeles in January of 2025, we collaborated with a community group in Altadena to track their soil remediation efforts using remediation plants. In May of 2025, we mapped the resident's yard into 10 sections and collected 4 random soil samples from each section. The sample area was a burnt garden sitting next to the house's destroyed foundation. We measured the soil pH, soil moisture, temperature, and heavy metal concentrations using a handheld XRF device. While there is some variance, most of our initial soil samples have lead levels ranging from 50 to 600 ppm. Soil pH ranged from 5.18 to 8.01. Following soil remediation with daikon radish, we collected soil and plant samples in January 2026. 5 soil sections, 3 of which were planted with daikon, showed a decrease in soil lead concentration. Daikon radish absorbed a noticeable amount of copper (9-49 ppm), but we did not detect lead uptake. This suggests that daikon may have a positive, but potentially limited, effect on soil remediation after wildfire contamination.

## 73. SEED LIMITATION OF PINUS PONDEROSA AND P. JEFFREYI

Elizabeth M. Garcia<sup>1</sup>, Sophie J. Crehan, Marko J. Spasojevic

<sup>1</sup> Department of Evolution, Ecology, & Organismal Biology, University of California, Riverside

Corresponding Author: Elizabeth M. Garcia, Department of Evolution, Ecology, & Organismal Biology, University of California, Riverside (lizg@cpp.edu)

California forests play a crucial role in carbon storage, lumber production, and biodiversity, and within these forests, pines are key drivers of these processes. However, many pine species are facing the combined threats of drought, rising temperatures, and pests. Understanding pine health is crucial for maintaining overall forest health. In Southern California, *Pinus jeffreyi* (PINJEFF) and *Pinus ponderosa* (PINPON) are important species. Research in the San Jacinto Forest Dynamics Plot (located on the west slope of Mt. San Jacinto at 1774m) has found no recruitment of these species in the last 5 years. To understand what limits recruitment of these two species, we surveyed cone production in the summer of 2025, by: 1) counting green cones on trees, and 2) counting ground cones and recording the amount of granivory. We found that none of the PINJEFF (n=19) surveyed produced cones. For PINPON (n=30) only 3 cones were counted in the trees, but 43% of PINPON sampled had  $\geq 100$  ground cones, with 76% of the adult ground cones exhibiting 75% granivory. Local soils and topography didn't contribute to determining variation in cone production among these individuals. These results highly suggest that this pine community is likely seed limited, and suggests that these populations may be in decline. As these pines are growing along their lower elevational range limit, these patterns suggest the potential for an upslope range shift of montane hardwood-conifer forests.

## 74. A LABORATORY-BASED APPROACH TO ASCERTAIN THREATENED HAWAIIAN ARBOREAL SNAILS' PLANT PREFERENCES

Brooklyn Burch, Cleo Linzer, Erin Halligan, Yuankai Alex Gao, Wallace M. Meyer III

Corresponding Author: Brooklyn Burch (bmby2025@mymail.pomona.edu)

Informed conservation recommendations are urgently needed if we aim to preserve the many Hawaiian arboreal snails threatened with extinction. Recent efforts by conservation practitioners in Hawaii have incorporated field-based plant and snail surveys to identify native plants that support arboreal snail populations. Here we test if patterns from field studies can be replicated in a lab setting using two snail arboreal species (*Succinea sp.* and *Philonesia hartmanni*) and four native plant species, two that were preferred (*Hydrangea arguta* and *Ilex anomala*) and two that were avoided (*Cibotium chamissoi* and *Metrosideros polymorpha*) by both snail species in two field experiments in Mt Kaala, Oahu. In all experimental replicates individual snails were exposed to equal amounts of leaves of two plant species, one preferred and one avoided by snails in the field experiments resulting in 8 pairwise treatments. Results from our lab experiments did not support patterns found in the field. While *Succinea sp.* preferred *H. arguta* over *C. chamissoi* in our lab experiments, there were no preferences for plants preferred by snails in the seven other comparisons. Interpreting these findings is difficult as it is impossible to determine if highly manipulated lab experiments modify snail preferences or if snail preferences in the field are not related to food resources. It remains unclear if pairwise lab experiments are a tool that can provide insights into snail plant preferences.

## 75. HYDROCHEMICAL TRACERS REVEAL GROUNDWATER LOADING IN THE CHANNELIZED ARROYO SECO, SOUTHERN CALIFORNIA

Jessica Valenzuela<sup>1</sup>, Irene Cordero<sup>1</sup>, Jose Garcia<sup>1</sup>, Brisa Gatica Reyes<sup>1</sup>, Adriana Ibarra<sup>1</sup>, Alicia Lopez<sup>1</sup>, Andrew Perez<sup>1</sup>, Ashley Rodriguez<sup>1</sup>, Mackenzie Schilling<sup>1</sup>, Priscilla Viramontes<sup>1</sup>, Emilee Xie<sup>1</sup>, Barry Hibbs<sup>1</sup>

<sup>1</sup> Environmental Science Department, California State University-Los Angeles

Corresponding Author: Barry Hibbs, Environmental Science Department, California State University-Los Angeles (bhibbs@calstatela.edu)

The lower Arroyo Seco is a mostly urban stream flowing from the Devils Gate Reservoir to the Los Angeles River. A 4.5-km reach between Pasadena and Hermon Park is fully concrete-lined, yet field observations suggest it behaves as a gaining stream because groundwater discharges through cracks and joints in the channel. We sampled surface water and groundwater along the reach. Field parameters included temperature, pH, specific conductance, and dissolved oxygen (DO); laboratory analyses included nitrate-N, ammonia-N, orthophosphate, boron, sulfate, and chloride. Selenium and stable water isotopes are pending. Surface water showed daytime DO supersaturation (~130%, 11–12 mg/L), consistent with photosynthesis, whereas groundwater was oxic but undersaturated (1–3 mg/L; 17–33%). Stream nitrate increased downstream from ~1.8 to 2.25 mg/L NO<sub>3</sub>-N, while groundwater ranged from 2.2 to 7.7 mg/L (mean ~5 mg/L). Boron rose slightly from 0.14 to 0.16 mg/L in surface water, but groundwater averaged ~2.5 mg/L. Ammonia-N and orthophosphate were at or below detection limits ( $\leq 0.015$  mg/L NH<sub>3</sub>-N;  $\leq 0.15$  mg/L PO<sub>4</sub>). Mass-balance mixing using conservative tracers indicates groundwater contributes ~15–19% of streamflow along the lined reach. The channel overlies the marine Monterey Formation, which contains selenium that may be mobilized as soluble oxyanions under oxidizing conditions produced by oxygen- and nitrate-bearing groundwater. We therefore predict increasing dissolved selenium downstream.

## 76. ENVIRONMENTAL DNA AS A TOOL FOR MONITORING STICHAEIDE AND PHOLIDAE DIVERSITY

Brianna Chau<sup>1</sup>, Joseph Heras<sup>1</sup>

<sup>1</sup>College Of Natural Sciences, California State University, San Bernardino

Corresponding Author: Brianna Chau, College Of Natural Sciences, California State University, San Bernardino

(007962884@coyote.csusb.edu)

Environmental DNA (eDNA) has emerged as a powerful, non-invasive tool for monitoring biodiversity by detecting genetic material shed by organisms into their environment. Typically collected from soil, sediment, water, or air, eDNA enables species detection and may also provide insights into species abundance. In this study, we focused on fishes from the families *Stichaeidae* and *Pholidae*. DNA was extracted from multiple species within these families, and primers designed to target fish-specific mitochondrial gene fragments were used. Polymerase Chain Reaction (PCR) was employed to amplify the target fragments, which were then sequenced using Sanger sequencing. The resulting sequences were aligned, and genetic diversity was estimated. These gene fragments will serve as reference material for future studies on these taxa. Overall, this work contributes to ongoing efforts to refine eDNA protocols for reliable species identification and to advance biodiversity assessments in marine ecosystems.

## 77. EARLY PATTERNS OF SEEDLING RECOVERY FOLLOWING WILDFIRE IN THREE NATIVE CALIFORNIA PLANTS

G. Olivia Plumb<sup>1</sup>, Casey D. Wisely<sup>1</sup>, Dr. Gretchen North<sup>1</sup>, Milan Coleman<sup>1</sup>, Emma McLaughlin<sup>1</sup>, Graham Luethe<sup>1</sup>, Hannah Tawadrous<sup>1</sup>, Samuel Loundy<sup>1</sup>

<sup>1</sup> Biology Department, Occidental College

Corresponding Author: G. Olivia Plumb, Biology Department, Occidental College (plumb@oxy.edu)

As wildfire intensity and frequency rise globally, predicting post-fire recovery of plant communities becomes increasingly critical, yet early seedling establishment following fire is highly variable and depends on many physiological, environmental, and biotic factors. We investigated the factors contributing to seedling survival and growth rates for one year following the Eaton Fire in Altadena, California, focusing on three native facultative resprouting species *Artemisia californica*, *Malosma laurina*, and *Salvia mellifera*. Twenty 2m<sup>2</sup> plots were established across two recently burned sites, where seedling height, survivorship, and soil temperature were regularly monitored during the first growing season. Soil samples were also collected at two intervals to characterize changes in microbial and mycorrhizal community composition. In addition, leaf and root heat tolerance of seedlings were measured to assess how physiological thresholds align with survival patterns. We hypothesized that both abiotic and biotic conditions would influence seedling survival and growth, and that physiological heat tolerance alone would not fully predict post-fire outcomes. Preliminary results suggest survival differences between species and sites. Ongoing microbial and heat tolerance analyses will further clarify mechanisms shaping early recovery and regeneration in post-fire landscapes.

## 78. THE RELATIONSHIP BETWEEN ALGAE COVER AND ANEMONE ABUNDANCE IN THE INTERTIDAL ZONE

Mackenzie Bravo Woo<sup>1</sup>, Natalie Minor<sup>2</sup>, Pildo Moon<sup>1</sup>

<sup>1</sup> Department of Biology, Pomona College

<sup>2</sup> Department of Biology, Harvey Mudd College

Corresponding Author: Mackenzie Bravo Woo, Department of Biology, Pomona College (mkba2023@mymail.pomona.edu)

With space often being the most limiting resource in intertidal, organisms show aggressive behaviors due to space competition. Aggregating anemone (*Anthopleura el.*) show aggressive intraspecific interactions in response to competition for space or availability of food. Algae also competitively fight for space, and by smothering, overgrowing, and space preemption, algae can physically occupy space against other species. Comparing the abundance of aggregating anemone and diverse species of algae allows us to understand the spatial dynamic in intertidal zones, where the unique geographic scale creates a wide range of communities. Our hypothesis was that sessile intertidal organisms compete for space on rocks, so more of one type leads to fewer of others. We predicted that in the rocky intertidal zone at Shaw's Cove in Laguna Beach, areas with higher percent cover of algae would have lower abundance of aggregating anemone due to competition for space. We sampled three 0.25 m<sup>2</sup> quadrats along 4 transect lines at randomly selected

distances, counted aggregating anemone in each quadrat, and measured percent cover for 5 algae species. The dominant algae per quadrat was used for comparison with aggregating anemone abundance. Aggregating anemone abundance and % algae cover showed weak positive correlation, suggesting algae may provide habitat and food resources that support aggregating anemone.

## 79. HANDGRIP STRENGTH OF PATIENTS IN PAIN MANAGEMENT

Alexander W. Lee<sup>1</sup>, Kyle Yeh<sup>2</sup>

<sup>1</sup> The Webb Schools

<sup>2</sup> Brown University

Corresponding Author: Alexander W. Lee, The Webb Schools (alexanderlee8690@gmail.com)

Handgrip strength is a significant indicator of health. People with decreased handgrip strength can have a higher risk of dementia, stroke, and even premature death. We wanted to assess the prevalence of decreased handgrip in patients in a pain management clinic and whether decreased handgrip is correlated with age, body mass index, blood pressure, heart rate, chronic pain, history of falls, use of assistive walking devices, and chronic medical conditions. This cross-sectional study was set in a pain management clinic, where 120 community-dwelling adults 18 years and older were recruited for this study. The results showed that among male and female participants ages 18-59, 53.3% to 73.7% had weak grip strength. Of those men and women aged 60-91, 37.5% to 51.2% had a weak left-hand grip. This study found that patients across all age groups in a pain management clinic had much weaker handgrip strength than the general population, ranging from 2% for men and women ages 18-59, to 5% for those over 60. Logistic regression analysis showed that for every 1 beat increase per minute of the pulse, the odds of having a weak right-handgrip test increase by 3.9%. None of the other factors was statistically significant. These findings emphasize the need for pain management providers or healthcare providers who refer patients to a pain management clinic to evaluate patients with weak handgrip.

## 80. MULTIDRUG RESISTANCE IN THE URBAN WATERSHEDS OF LOS ANGELES

Priscilla Tso<sup>1</sup>, Natalia Mitchell<sup>1</sup>, Mia Isabel Lazo<sup>1</sup>

<sup>1</sup> Biological Sciences Department, Mount Saint Marys' University Los Angeles

Corresponding Author: Priscilla Tso, Biological Sciences Department, Mount Saint Marys' University Los Angeles (pristso@msmu.edu)

Los Angeles is home to over 13 million residents, and activity, sewage leaks, and wildlife contribute to fecal contamination in waterways. Following the severe storms of 2024 and 2025, *Escherichia coli* (*E. coli*) likely entered local watersheds through runoff, posing a public health concern. This study hypothesized that *E. coli* in urban watersheds would exhibit antibiotic resistance (AR) and multidrug resistance (MDR) due to the prevalence of antibiotic use. Weekly water samples were collected from January 2024 to October 2025 at Ballona Creek (BC) and Playa Del Rey Beach (PDR) in Los Angeles, CA. Total *E. coli* and tetracycline-resistant *E. coli* were analyzed using a modified IDEXX method amended with tetracycline. 85 isolates were isolated on MacConkey agar selective media and screened using the disk diffusion method with ten antibiotics. *E. coli* exceeded EPA limits (of 410 CFU/100 mL for low contact activities) all year-round in Ballona Creek and periodically in Playa Del Rey showed a moderate correlation with rain events. 96% of *E. coli* isolates were resistant to erythromycin, and 87% were resistant to amoxicillin. 61% of isolates showed MDR and were resistant to 4 or more antibiotics. 23% were resistant to 5 or more. These findings reveal high levels of tetracycline- and multidrug-resistant *E. coli* in Los Angeles watersheds, emphasizing the need for antibiotic regulation and microbial source tracking.

## 81. THE ROLE OF SURFGRASS (PHYLLOSPADIX TORREYI) AND SAND MOVEMENT IN SOUTHERN CALIFORNIA ROCKY INTERTIDAL

Sal Gutierrez<sup>1</sup>, Dr. Jayson Smith<sup>1</sup>, Dr. Jeremy Claisse<sup>1</sup>, Dr. Rachel Blakey<sup>1</sup>, Dr. Christine Whitcraft<sup>2</sup>

<sup>1</sup> Biological Sciences Department, Cal Poly Pomona

<sup>2</sup> Biological Sciences Department, California State University, Long Beach

Corresponding Author: Sal Gutierrez, Biological Sciences Department, Cal Poly Pomona (salgutierrez@cpp.edu)

The surfgrass, *Phyllospadix torreyi* inhabits the middle to lower rocky intertidal zone along the wave-exposed coast from Canada to Baja California. Surfgrass is often considered a foundation species/ecosystem engineer as it drives community composition through providing structure, modifying the environment, and stabilizing the surrounding habitat. However, in coastal areas where sand movement is high, such as in southern California, the understory habitat type and community composition facilitated by surfgrass beds may be dynamic and unstable, putting in question the role of surfgrass as an ecosystem engineer. In this study, we elucidated the potential role and consistency of surfgrass as a foundation species by monitoring *P. torreyi* cover, sand depth, and the community structure of both macrophytes/macrobenthos and meiofauna inside and adjacent to surfgrass beds at two sites in southern California differing in the level of sand movement and dominance. Preliminary patterns to date suggest that surfgrass beds in a heavily sand influenced location were relatively simple while macrophytes/macrobenthos and meiofauna were more abundant and diverse under surfgrass where sand inundation was uncommon.

## 82. ENVIRONMENTAL EFFECTS ON COASTAL HOUSING VIA REMOTE SENSING

Micah Kim<sup>1</sup>, Kelly Luis<sup>2</sup>, Gabriela Shirkey<sup>3</sup>, Richelle Tanner<sup>1</sup>

<sup>1</sup> Environmental Science & Policy Department, Chapman University

<sup>2</sup> Earth Science Department, Jet Propulsion Laboratory and California Institute of Technology

<sup>3</sup> Grand Challenges Initiative Department, Chapman University

Corresponding Author: Micah Kim, Environmental Science & Policy Department, Chapman University (micahkim@chapman.edu)

Living along the coast has grown increasingly popular over the years, offering desirable amenities such as cooler temperatures, recreational opportunities, and scenic views. However, climate change has intensified extreme weather events worldwide, while also accelerating coastal erosion and rising sea levels. These changes increase the risks associated with coastal living, directly impacting housing markets in these areas. In order to salvage the housing in the coastal regions, environmental and economic variables need to be tested to determine which factors have significant impacts. By integrating spectral imagery from NASA's ECOSTRESS and EMIT satellites with annual housing price index data from the Federal Housing Finance Agency, we can examine how environmental variables influence coastal communities. Using a hedonic modeling approach, this project compares land and water quality indicators including land surface temperature, vegetation index, chlorophyll index, and turbidity. With the satellite-derived imagery data and housing price trends to identify patterns linking environmental characteristics to shifts in coastal property values.

## 83. EVALUATING THE IMPACT OF ART THERAPY ON COGNITIVE FUNCTION IN AGING POPULATIONS

Aanya Pillai<sup>1</sup>

<sup>1</sup> Sage Hill School

Corresponding Author: Aanya Pillai, Sage Hill School (27pillaia@sagehillschool.org)

Cognitive decline is a major concern among aging populations, particularly as conditions such as Alzheimer's disease and other forms of dementia become more prevalent. Non-pharmaceutical interventions have increasingly been explored as potential ways to slow cognitive deterioration. This study examined whether participation in art therapy was associated with slower rates of cognitive decline in older adults. The purpose of the study was to evaluate whether engagement in creative activities, such as painting and drawing, correlated with improved or maintained cognitive

functioning over time. To investigate this question, publicly available datasets on aging and cognitive health were analyzed to compare individuals who regularly participated in art-based activities with those who did not. Cognitive performance measures, including memory, attention, and executive functioning, were examined across both groups. Statistical comparisons were conducted to identify patterns in cognitive change over time and to determine whether participation in art therapy was associated with differences in cognitive outcomes. The analysis indicated that individuals who participated in art therapy or similar creative activities demonstrated slower cognitive decline and higher average cognitive scores compared with those who did not participate in such activities. Participants also showed improvements in mood and engagement, which may have contributed to cognitive resilience. Overall, the findings suggested that art therapy may serve as a valuable non-pharmacological intervention for supporting cognitive health in older adults. These results highlighted the potential benefits of incorporating creative therapeutic programs into aging and dementia care strategies.

#### 84. SPATIAL JUSTICE NEAR THE DIESEL DEATH ZONE

Alex Peirce<sup>1</sup>, Abigail Gordon<sup>1</sup>, Sara O'Connor<sup>1</sup>, Gary Hytrek<sup>1</sup>

<sup>1</sup> Geography Department, California State University- Long Beach

Corresponding Author: Sara O'Connor, Geography Department, California State University- Long Beach (sara.oconnor@csulb.edu)

Long Beach can directly map its racial and health inequalities onto its pollution burden. In North Long Beach, the corridor between the Ports of Los Angeles and Long Beach, adjacent to the “diesel death zone,” are the 91 and 710 freeways. According to CalEnviroScreen, this area has a pollution burden score between 81 and 100 percent. Despite this burden, Los Angeles Metro proposed another freeway expansion in this neighborhood. Drawing from qualitative and GIS data collected through interviews, archival review, and fieldwork, this case study examines, how has LA Metro engaged the community in the 91-freeway expansion process and what would an authentic process of engagement look like? In partnership with community-based organizations, residents, and government officials, this study strives to develop an effective community engagement process driven by models of participatory decision-making. This research will contribute significant findings regarding community engagement in policy and politics in socioeconomically disadvantaged communities in Long Beach. Further, this research provides insights into critical information and communication gaps between government apparatuses and community in transportation development and is working towards a model of community engagement that increases citizens’ capacity to meaningfully engage in transportation development planning, while uncovering challenges and opportunities for engagement in intergovernmental policy processes.

#### 85. SEX BASED SIZE DIFFERENCES IN LARUS MARINUS CHICKS

Gia Rizvi<sup>1</sup>, Kristen M. Covino<sup>2</sup>

<sup>1</sup> Biology, Loyola Marymount University, grizvi@lion.lmu.edu

<sup>2</sup> Biology Department, Loyola Marymount University, kristen.covino@lmu.edu

Corresponding Author: Gia Rizvi, Biology Department, Loyola Marymount University (grizvi@lion.lmu.edu)

The Great Black-backed Gull, *Larus marinus*, is a species of urgent conservation concern, with recent studies of its ecology and physiology seeking to fill various knowledge gaps. Relatively little research has been conducted to understand the morphological differences between male and female gull chicks in this genus. Our study aims to investigate potential sex-specific differences in chick size and/or growth rate. Using blood samples from individual chicks in a breeding colony located on Appledore Island, Maine, we extracted DNA and amplified gene segments that differ between their sex chromosomes. These were analyzed using gel electrophoresis, thus genetically sexing the individuals. Morphometric information of headbill length and mass previously gathered on hatchday and day 12 will be compared across individual chicks to determine sex-specific characteristics. The availability of genetic sex data is necessary to understand chick growth rate and survivorship between males and females.

## 86. PARENTAL PROVISIONING SHIFTS IN GULL CHICKS

Matisse McKenna<sup>1</sup>, Rebecca Olvera<sup>1</sup>, Sofia Carranza<sup>1</sup>, Kristen Covino<sup>1</sup>

<sup>1</sup> Biology Department, Loyola Marymount University

Corresponding Author: Rebecca Olvera, Biology Department, Loyola Marymount University (rolvera2@lion.lmu.edu)

Diet differences within and across Great Black-backed Gull (*Larus marinus*) broods affect chick growth and survival, but these differences are not always easy to document. Stable isotope analysis of feathers allows us to examine diets of individuals throughout their developmental stages: hatchling (day of hatch), mid-growth (~20 days old), and pre-fledgling (~40 days old). For our research, we use stable isotopes analysis, focusing on carbon and nitrogen isotope levels to assess food sources (marine vs. terrestrial) and trophic level, respectively. Preliminary results show carbon isotope level differences in hatchlings and nitrogen isotope level differences in pre-fledgling. To expand on these results, we are taking a repeated sampling approach and tracking the same individuals throughout development. This will allow us to determine what parental provisioning shifts occur throughout the chick growth period and track the effects of these shifts. In 2023, we established 5 nests to focus on repeated sampling throughout the individual chicks' development and increased this number of nests to 15 nests in 2024 and 2025. These samples are in processing, and we hope that their analysis reflect our previous results and further help us understand how and when Great Black-backed Gull parental feeding strategies change through the breeding season and how these differences may impact chick survival.

## 87. BIOEROSION PATTERNS IN OLYMPIA OYSTERS

Julianna Colucci<sup>1</sup>, Danielle Zacherl<sup>1</sup>, Taylor Naquin<sup>1</sup>

<sup>1</sup> Biological Sciences Department, California State University Fullerton

Corresponding Author: Julianna Colucci, Biological Sciences Department, California State University Fullerton (jcolucci@csu.fullerton.edu)

Bioerosion by boring sponges (*Cliona spp.*) and polychaete worms can compromise shell integrity in the Olympia oyster (*Ostrea lurida*), yet regional patterns in southern California remain poorly quantified. This study examines bioerosion distribution across valve surfaces and between estuarine sites in southern California. Erosion was quantified using ImageJ analysis of macro-photography images from *O. lurida* shells collected at Anaheim Bay and San Diego Bay. Boring sponge and polychaete worm prevalence was assessed by comparing percent cover and borehole abundance between upper and lower valves. Preliminary findings reveal distinct valve-specific bioerosion patterns. Bottom valves exhibited higher boring worm area coverage (approximately 26% versus 19% on top valves) and greater total internal shell erosion (approximately 26% versus 21%). In contrast, top valves showed higher boring sponge area coverage (approximately 3.5% versus 0.8% on bottom valves) and greater worm bore hole abundance (approximately 8.5 versus 5 holes per valve). These patterns provide critical baseline data for assessing oyster bed health and predicting shell degradation rates in restoration contexts. Understanding valve-specific bioerosion vulnerability will help restoration practitioners evaluate population health and assess site-specific threats to *Ostrea lurida* habitat across the species' southern range.

## 88. PHOTOSYNTHETIC PERFORMANCE OF ROCKWEED, SILVETIA COMPRESSA

Kate Selfe<sup>1</sup>, Hailey Pistochini<sup>1</sup>, Robin J. Fales<sup>2</sup>

<sup>1</sup> Concentration in Life Sciences, Soka University of America

<sup>2</sup> Concentration in Environmental Studies, Soka University of America

Corresponding Author: Robin J. Fales, Concentration in Environmental Studies, Soka University of America (rfales@soka.edu)

Macroalgae (seaweed) are valuable primary producers, ecosystem engineers, and carbon sinks which make them

especially important in the context of climate change. Currently, macroalgal beds are experiencing a notable restructuring of community composition due to climate change and anthropogenic pressures. To further understand and predict how climate change could influence foundation species in marine communities, we constructed photosynthesis-irradiance (PI) curves to determine photosynthetic parameters for the rockweed species *Silvetia compressa*. Through our pilot study we aimed to determine the optimal light intensity and saturation point of *S. compressa*. We collected samples from Little Corona Del Mar, Newport Beach, CA. Samples were transported to Soka University, where they underwent a 24-hour acclimation period before beginning experiments. We used PreSens oxygen probes to measure oxygen evolution under changing light intensity conditions: 0 – 1300 PAR, to generate PI curves for each sample. Our initial results indicate that photosynthesis did not reach photoinhibition at the highest light level tested, 1300 PAR. The compensation point was found to be 10 PAR. We plan to repeat trials to determine saturation and super-saturation points for *S. compressa*. By understanding the photosynthesis of *S. compressa*, we can better predict how climate change could affect this valuable foundation species, and the community it supports.

## 89. AGGREGATION DYNAMICS IN ANTHOPLEURA ELEGANTISS

Juancarlo Jimenez Gutierrez<sup>1</sup>, Jennifer L Burnaford<sup>1</sup>

<sup>1</sup> Department of Biological Science, California State University Fullerton

Corresponding Author: Juancarlo Jimenez Gutierrez, Department of Biological Science, California State University Fullerton (jjimenez@csu.fullerton.edu)

*Anthopleura elegantissima* is an anemone that forms dense aggregations of conspecifics, which can be found throughout the rocky intertidal habitat of Southern California. They are a dominant species that can propagate through sexual and asexual reproduction. In this study, we are tracking 19 aggregations in the rocky intertidal zone at Point Fermin, San Pedro, CA. In the field, weekly, for each aggregation, we record total area, number of polyps, total length of perimeter, and basal diameter of 20 polyps; and we take archival photographs. The aim of this study is to track changes in aggregation, size, and shape and determine if there are relationships with weather conditions or differences among micro-habitants. Data collection started in December 2025 and will be completed in May 2026. Preliminary results will be presented at the SCAS conference.

## 90. DRIVERS OF URBAN SOIL MICROBIAL COMMUNITY COMPOSITION

Citlalli Vergara<sup>1</sup>, Steven D. Allison<sup>1</sup>, Caitlin Hicks Pries<sup>2</sup>

<sup>1</sup> Ecology and Evolutionary Biology Department, University of California Irvine

<sup>2</sup> Department of Biological Sciences, Dartmouth College

Corresponding Author: Citlalli Vergara, Ecology and Evolutionary Biology Department, University of California Irvine (vergarc2@uci.edu)

Urban soil microbial communities facilitate a wide range of ecosystem functions that impact cities, such as air quality regulation and carbon sequestration. However, the identity and functions of urban soil microbes are still largely unknown, making the task of determining soil microbial influence on urban ecosystems difficult. Direct drivers such as vegetation and soil properties are known to shape microbial communities. Recently, researchers have focused on how indirect drivers such as socioeconomic factors may also influence microbial community composition. This study compares urban Southern California microbial community abundance and composition across 10 high- and low-income neighborhoods in Los Angeles and Orange County. We collected 43 soil samples from household lawns and backyards, extracted bacterial DNA, and assessed community composition using 16S amplicon sequencing. Soil properties, including pH, gravimetric water content (GWC), percent carbon, percent nitrogen and texture, and neighborhood median income were collected. Soil pH and GWC were found to be the most relevant drivers of soil bacterial communities. Median income did not affect microbial community composition. Additionally, there were higher percentages of carbon and nitrogen in soils from low-income households. This study contributes new understanding of how urban soil microbiomes may enhance urban ecosystem functions across neighborhoods of varying socioeconomic status.

## 91. VISUALIZING THE COLONIZATION PATHWAYS OF NON-RHIZOBIAL BACILLUS SIMPLEX IN ROOT NODULES

Malee Bedolla<sup>1</sup>, Mary Avalos<sup>1</sup>, Dr. Nancy Fujishige<sup>1</sup>

<sup>1</sup> Biology Department, Loyola Marymount University

Corresponding Author: Malee Bedolla, Biology Department, Loyola Marymount University (Mbedolla@lion.lmu.edu)

*Bacillus simplex* was isolated from Negev Desert soil, in the rhizosphere of *Zygophyllum dumosum* (bushy bean caper). This *Bacillus simplex* strain demonstrates plant growth-promoting properties, including increased plant biomass on multiple species and phytohormone production. The strain also improves nitrogen-fixing symbiosis between the soil bacterium, *Sinorhizobium meliloti* and its legume host, *Melilotus alba* (white sweet clover). In the Rhizobium-legume symbiosis, the plant builds root nodules to house the rhizobia. After rhizobial nodule colonization, photosynthate is provided to drive the energetically expensive nitrogen-fixation reaction, converting nitrogen gas to biologically usable forms, which the plant utilizes as biofertilizer. When *Bacillus simplex* is combined with *Sinorhizobium meliloti* to inoculate *M. alba* roots, the number and size of nodules increase relative to plants inoculated with *S. meliloti* alone. To determine whether *Bacillus* colonized the root nodule's interior, the nodule exteriors were sterilized, and intranodular bacteria were cultured on agar plates. *Bacillus simplex* was recovered from the nodules, however, their intranodular location and colonization pathway remain poorly understood. To visualize the bacterium and investigate the mechanism of colonization, the *Bacillus* strain is transformed with either pNF8 or ECE152, plasmid vectors which constitutively express green fluorescent protein (GFP). Root colonization is visualized using confocal laser

## 92. WATER USE BY BIRDS IN THE CHAPARRAL DURING SEVERE AND EXTREME DROUGHT PERIODS

Ebby Slater<sup>1</sup>, Jennifer Clarke<sup>1</sup>

<sup>1</sup> Biology Department, University of La Verne

Corresponding Author: Jennifer Clarke, Biology Department, University of La Verne (jclarke@laverne.edu)

Globally, over 50% of avian species are exhibiting severe declines. Climate change, especially pertaining to temperature and precipitation, plays a major role in these declines. The semiarid chaparral ecosystem is home to a variety of avian species but little is known regarding the effects of increasing temperatures and prolonged droughts on chaparral-dwelling birds. The goal of this study was to examine the importance of water sources to year-round resident bird species in a chaparral habitat. We investigated the hypothesis that bird attendance at water sources would be related to daily temperatures in the chaparral. We conducted the study in the chaparral area of the California Botanical Garden (CBG), Claremont, CA, during 20-29 April and 21-30 June 2025. Motion-activated trail cameras photographed bird activity, sunrise to sundown, at artificial water sources fed by drip lines at five locations. We compared activity of eight year-round-resident species at water sources for 6-7 days in each range of low (12.2-21.4 C), moderate (23.1-26.1 C), and high (26.4-36.9 C) temperatures. Photographic entries (N= 2271) revealed that birds attended water sources significantly more in high versus moderate and low temperatures ( $p < 0.01$ , both cases). Given increasing pressures from climate change, providing water sources for birds in semiarid environments could aid to offset the negative impacts of anthropogenic driven climate change, especially during periods of severe/extreme drought.

## 93. COASTAL CONSTRUCTION AND CARBON STORAGE: COMPARING SEDIMENT STORED CO<sub>2</sub> ACROSS DEVELOPMENT STAGES

Mariam Tadevosyan<sup>1</sup>, Elle Komara<sup>1</sup>, Sarah Joy Bittick<sup>1</sup>, Le Wang<sup>2</sup>

<sup>1</sup> Biological Sciences Department, Loyola Marymount University

<sup>2</sup> Department of Mathematics, Statistics, and Data Science, Loyola Marymount University

Corresponding Author: Mariam Tadevosyan, Biological Sciences Department, Loyola Marymount University (mtadevos@lion.lmu.edu)

Marine and coastal ecosystems serve as critical carbon sinks, yet their capacity for sequestration is in a constant state of being threatened by various sources of anthropogenic coastal development and land-use changes. This research study investigates the impact of coastal construction and numerous catastrophic events on carbon dioxide (CO<sub>2</sub>) storage that can be found within marine sediments, located in the Los Angeles region. Specifically, it examines how chronic runoff from construction projects interacts with the sudden addition of debris and toxic materials following the massive man-made wildfire that occurred in January 2025, the Palisades Fire. Utilizing a comparative framework, sediment samples were collected from three chronologically distinct sites: Point Dume (fire disturbance) (34°0'3.14"N 118°48'24.62"), Cabrillo Beach (active construction) (33° 42' 39.6" N, 118° 17' 2.4" W), and Sunset Point Beach (post-construction) (34° 2' N, 118° 33' W). Analysis incorporated water quality monitoring via YSI, grain size distribution, and quantification of organic and inorganic carbon as a proxy for CO<sub>2</sub> sequestered in the sediments. This study demonstrates the ability of sediments to store carbon with the combined stress of city growth and natural disasters like wildfires. Despite fluctuations from these stressors, coastal sediments remain adaptive carbon reservoirs across various stages of human impact.

#### 94. GROUND-DWELLING ARTHROPOD ABUNDANCE AFTER MAJOR WILDFIRES IN CALIFORNIA

Harrison Porter<sup>1</sup>, Natalia Okamura<sup>1</sup>, Avion Auberry<sup>1</sup>, Jayden Phoncharern<sup>1</sup>, Arely Ortega<sup>1</sup>, Derek Tran<sup>1</sup>

<sup>1</sup> Department of Biological Science, CSUF

Corresponding Author: Anna Holmquist, Department of Biological Science, CSUF (aholmquist@fullerton.edu)

Extreme weather events driven by climate change have been increasing in frequency worldwide, with major impacts on biological systems. In California, fire frequency has been steadily increasing, shifting the fire regime drastically from its historical state. This has impacts on native flora and fauna, with some habitats, such as chaparral, shifting into new steady states, such as grasslands. Arthropod communities have been largely overlooked in wildfire research despite playing a critical role in nutrient cycling and biocrust composition. Using pitfall trapping and leaf litter sampling, we collected arthropods from a total of 83 burned and unburned sites from 6 UC Reserves in Northern California after major fires in 2020. Using these samples, we compared arthropod abundance between burned and unburned sites across different ecosystem types to test the impact of fire on arthropod communities. Our results can help inform future conservation efforts and provide a foundation for understanding how arthropod communities shift in response to fire.

#### 95. MY TYPE OF SLIDES

Emma Perez<sup>1</sup>, Chloe Saldaña<sup>1</sup>, Will Farris<sup>1</sup>, Ethan Kahn<sup>1</sup>, Regina Wetzler<sup>1</sup>

<sup>1</sup> Marine Biodiversity Center, Natural History Museum of Los Angeles County

Corresponding Author: Emma Perez, Marine Biodiversity Center, Natural History Museum of Los Angeles County (emmaperez@nhm.org)

Type specimens are a vital component of scientific understanding and biodiversity research. A type is an exemplary specimen of a taxon that serves to establish uniform features of that particular species. They anchor species descriptions and are critical for taxonomists working on revisions or new descriptions, and are the most valuable specimens in a natural history collection. The Marine Biodiversity Center at the Natural History Museum of Los Angeles County is currently digitizing 200+ glass slides containing crustacean type material. These slides include small species (<5mm) and their numerous dissected body parts. Here we present the workflow developed to efficiently stabilize, curate, digitize, and mobilize these specimens. The digitization pipeline begins with a full specimen inventory and condition assessment to determine curation needs. Each slide then proceeds through a standardized sequence of curation, digitization, and label imaging. Significant challenges include slides in poor condition with missing coverslips, cracked slides, and non-archival grade materials as well as incomplete taxonomic data requiring archival backtracking and additional taxonomic research. We offer solutions to address these issues without sacrificing efficiency. Stabilizing and maintaining these physical objects in perpetuity is essential to understanding our natural world. Making their data freely available is invaluable to protecting our world's biodiversity.

## 96. CROSS-SPECIES MODELING OF EPOGENETIC AGING IN THREE PRIMATES

Julia Shin<sup>1</sup>

<sup>1</sup> Oxford Academy

Corresponding Author: Julia Shin, Oxford Academy (juliagraceshin2@gmail.com)

Mammalian lifespans range significantly based on species and are influenced by various environmental and genetic factors that change as the organism ages. A significant genetic factor involved in predicting mammalian lifespan through molecular analysis is DNA methylation. As an epigenetic factor, methylation can be used as a measurable molecular biomarker to indicate aging, since DNA methylation trajectories correlate strongly with a mammal's lifespan. In this study, data from baboons, common marmosets, and rhesus macaques, was used to evaluate the expected lifespans of these three species. Data subsets were gathered from the Mammalian Methylation Consortium based on criteria of having over 100 samples of 10 or more varied ages. The data was input into the Epigenetic Pacemaker (EPM), where the epigenetic formula was used to illustrate the association between epigenetic and actual age by modeling CpG methylation trajectories. We evaluated the strength of correlation between methylation and age for the species' test subjects, displaying how the EPM can estimate aging rates. We can expect to observe methylation changes that follow consistent, age-associated trajectories, demonstrating a relationship between actual and epigenetic age. This work contributes to comparative epigenetics by refining how epigenetic aging timescales can be used to explain lifespan differences according to species.

## 97. A FPGA-BASED NEUROMORPHIC-DEEP LEARNING FUSION ARCHITECTURE FOR ENERGY EFFICIENT AI APPLICATIONS

Jaelyn Liang<sup>1</sup>, Andrew J. Blumberg<sup>1</sup>

<sup>1</sup> Westview High School

Corresponding Author: Jaelyn Liang ()

Artificial intelligence workloads are becoming increasingly costly in energy and hardware resources, creating demand for architectures with higher performance per watt. Neuromorphic computing is an energy-efficient approach because it uses event-driven computation, but standalone neuromorphic systems are often limited in memory capacity, programmability, and support for dense operations used in models such as DNNs, CNNs, and BERT. To address these limitations, this work presents a neuromorphic-deep learning fusion architecture implemented on a Zynq UltraScale+ FPGA. The design combines spiking neural network units with dense matrix, convolution, and transformer-attention accelerators, allowing different parts of a workload to run on the hardware block best suited to that computation. It also introduces a locality-aware memory system consisting of primary memory, a high-speed cache, and a replication buffer to reduce off-chip memory traffic and shorten data access time. The architecture was evaluated against an Nvidia A100, Nvidia L4, Google V2-8 TPU, and a CPU for running AI training and inference tasks. On transformer inference, the FPGA ran in 0.756 ms at 2.9 W, about 120.6x faster than the NVIDIA A100 and about 1,858x more energy efficient than the NVIDIA L4. On a CNN training step, it ran in 3.4 ms at 3.5 W, used the lowest power of any evaluated platform, and achieved 2.45x lower energy per step than the NVIDIA L4, although the NVIDIA A100 remained faster in raw latency at 1.14 ms. These results indicate that the proposed approach can reduce energy and cost while preserving the versatility required by modern workloads. The findings support this design as a practical direction for sustainable high-performance machine learning.

## 98. PRO-ENVIRONMENTAL BEHAVIOR AMONG AMERICANS

Analisa Vavoso<sup>1</sup>, Vincent Berardi<sup>1</sup>

<sup>1</sup> Psychology Department, Chapman University

Corresponding Author: Analisa Vavoso, Psychology Department, Chapman University (vavoso@chapman.edu)

As climate change, biodiversity loss, and pollution worsen, understanding the underlying factors of both individual and collective pro-environmental behavior (PEB) is key. In a nationally representative survey stratified by political affiliation, this study examines the beliefs, values, and identities of individuals who engage in PEB, as well as the specific actions they take (N = 661). Four dimensions of PEB were examined: social environmentalism, environmental citizenship, land stewardship, and conservation lifestyle. Conservation lifestyle behaviors, including recycling, limiting water and electricity use, and purchasing energy-efficient products, were the most frequently reported PEBs (M = 3.9, SD = 0.83). A score of 1 indicates no engagement with the behavior, and a score of 5 indicates performing the behavior as often as possible. A one-way ANOVA followed by Tukey HSD post-hoc tests revealed no statistically significant difference in PEB performance between Democrats (M = 2.95, SD = 0.86) and Republicans (M = 2.89, SD = 0.95),  $p = .69$ . However, Independents (M = 2.57, SD = 0.75) performed significantly less PEB than both Democrats ( $p < .001$ ) and Republicans ( $p < .001$ ). Using a linear regression approach, belief in collective action's impact, as well as self-efficacy, positively predicted engagement in PEB ( $p = 0.004$ ;  $p < 0.001$ ). Results have positive implications: individuals are already engaging in PEBs at a moderate frequency.

#### 99. IS AGE JUST A NUMBER? AN ANALYSIS OF TAPHONOMY IN OLDER DEPOSITS AT THE RANCHO LA BREA TAR PITS

Paola Lopez de Cardenas<sup>1</sup>, Julia Domanskis<sup>1</sup>, Wendy Binder Ph.D<sup>1</sup>, Isabella Del Castillo<sup>1</sup>

<sup>1</sup> Biological Sciences Department, Loyola Marymount University

Corresponding Author: Paola Lopez de Cardenas, Biological Sciences Department, Loyola Marymount University (plopezde@lion.lmu.edu)

The Rancho La Brea Tar Pits houses the largest collection of fossils from the Late Pleistocene in the world, from about 50,000 years ago through the Holocene. Analyses of taphonomy, which is defined as the process of bone fossilization from death to excavation, provide historic information about how environmental conditions changed over this period of time. Categories of taphonomy measured include weathering, abrasion, and pit wear. We expect taphonomy to reflect climate conditions, including the presence of water during burial. While previous research has focused on younger deposits (19-13 thousand years ago, kya), this analysis aims to better understand the older deposits of Pits 9 (which contained mammoths and mastodons) and 77, which represent 42 - 33 kya, a timeframe defined by significant climate instability characterized by abrupt millennial-scale oscillations between cold and warm phases, alongside the potential trampling effects of megafauna in Pit 9. Focusing on these older deposits allows us to gather data from a period of high-frequency environmental stress and compare these trends to other younger, more climatically distinct deposits. We hypothesize that taphonomy measurements will occur at higher rates in Pits 9 and 77 due to their extended entrapment window during a period of extreme climate instability. Future work may include sedimentary data and spatial analyses to potentially identify other factors leading to trends in taphonomy across the different deposit

#### 100. ESTIMATED COST OF DEVELOPMENT FOR THE EMBRYONIC STAGE OF THE CALIFORNIA GRUNION

Claremont Worley<sup>1</sup>, Darren Johnson<sup>1</sup>

<sup>1</sup> Department of Biological Sciences, California State University, Long Beach

Corresponding Author: Claremont Worley, Department of Biological Sciences, California State University, Long Beach (claremont.worley01@student.csulb.edu)

For species with variable development times, understanding the cost of development per unit time is important for understanding capacity for future growth and survival. This is particularly important for species whose development time is dictated externally (e.g. by photoperiod, mechanical cues, etc.). This study evaluates the cost of development in California Grunion, which uses such cues, throughout the embryonic stage. Respiration is a typical proxy for metabolic rate and energy consumption. However, respiration-based estimates of metabolic rate are rarely validated with any more

direct measurement. Using respirometry, we measured rates of energy consumption at 1-2 day intervals throughout the 11-day embryonic period of each cohort of eggs. A linear model describing respiration rate with respect to age was integrated to determine total cost of development. As an independent means of measuring development cost, we used calorimetry to calculate the average energy content of eggs and of newly hatched larvae and compared the difference against predicted total cost of development. Estimates from both methods aligned well. In addition, a significant effect of family was noted on total cost of development. If some families use less energy during the typical development period, it could enable them to survive the prolonged embryonic stage enforced by missing a hatching cue, as has been observed in grunion due to variation in tide height and swell.

## 101. MICROPLASTICS IN SOUTHERN CALIFORNIA FISH

Jenna Marie Cruz Aquino<sup>1</sup>, Jessica Flores<sup>1</sup>, Jazmin Gallardo<sup>1</sup>, Todd Clardy<sup>1</sup>, Samantha Leigh<sup>2</sup>, Misty Paig-Tran<sup>3</sup>, Benjamin Frable<sup>4</sup>, Jonathan Williams<sup>5</sup>, Chelsea Williams<sup>5</sup>, Daniel Pondella<sup>5</sup>, Dahiana Arcila<sup>4</sup>, Aaron Celestian<sup>6</sup>, William Ludt<sup>1</sup>

<sup>1</sup> Department of Ichthyology, Natural History Museum of Los Angeles County

<sup>2</sup> Department of Biological Sciences, California State University, Dominguez Hills

<sup>3</sup> Department of Biological Sciences, California State University, Fullerton

<sup>4</sup> Scripps Institution of Oceanography, La Jolla

<sup>5</sup> Vantuna Research Group

<sup>6</sup> Department of Mineral Sciences, Natural History Museum of Los Angeles County

Corresponding Author: Jenna Marie Cruz Aquino, Department of Ichthyology, Natural History Museum of Los Angeles County (jennaaquino@nhm.org)

Global plastic production has increased exponentially since the onset of large-scale industrialization in the 1960s, resulting in pervasive contamination of marine ecosystems. To date, more than 1,300 marine species have been documented ingesting plastic debris, with microplastic particles (<5 mm) identified in fish gastrointestinal tracts as early as 1949. Despite growing recognition of this issue, long-term trends in microplastic ingestion spanning pre- and post-industrial periods remain understudied. In particular, comparisons between benthic and deep-sea fishes are limited, in part due to incomplete understanding of plastic transport pathways in marine environments. Here, we investigate microplastic ingestion in benthic and deep-sea marine fishes across eight decades (1940s–2010s) using archived museum specimens. Two Southern California fish species with different feeding patterns were selected: *Stenobranchius leucopsarus* (Northern Lampfish) and *Cymatogaster aggregata* (Shiner Perch). GI tracts were dissected, chemically digested in KOH, and vacuum filtered onto glass filters. Using Raman spectroscopy, hyperspectral maps were collected to analyze potential plastics. Both species exhibited different microplastic consumption patterns over time with polyamide being the most prevalent microplastic. This study provides a temporal assessment of microplastics in marine fishes, informing future monitoring and policy strategies aimed at mitigating marine plastic pollution.

## 102. EFFECTS OF PREDATION ON THE DEVELOPMENT OF HARD-SUBSTRATE INVERTEBRATE ASSEMBLAGES

Kira Miller<sup>1</sup>

<sup>1</sup> Department of Biological Sciences, California State University, Long Beach

Corresponding Author: Kira Miller, Department of Biological Sciences, California State University, Long Beach (KiraMillerCollege@Gmail.com)

The composition of sessile benthic communities plays a critical role in shaping marine ecosystem structure and function, yet the processes governing their early assembly remain incompletely understood. While previous studies have emphasized competition, facilitation, and bottom-up drivers of succession, comparatively little attention has been given to the role of top-down control by predation in structuring early fouling communities. I experimentally tested the influence of predation on the early development of sessile invertebrate assemblages using subtidal settlement plates deployed with predator-exclusion cages, partial cage controls, and fully exposed treatments. Community development

was quantified by measuring total percent cover, diversity indices, and taxon-specific relative abundances. Predator exposure significantly reduced total percent cover and resulted in marked differences in community composition between treatments, while diversity metrics remained statistically similar across conditions. Predator exclusion promoted the dominance of competitively aggressive taxa, particularly compound ascidians, whereas exposed plates supported more evenly distributed assemblages. My results demonstrate that predation can exert strong top-down control on early successional fouling communities by shaping taxon-specific settlement and dominance patterns rather than altering overall richness or diversity.

### 103. THE IMPACT OF ROCKWEED ON INTERTIDAL SPECIES DIVERSITY

Ava Santos-Volpe<sup>1</sup>, Kevin Ye<sup>2</sup>, Mark Price<sup>1</sup>, Nina J Karnovsky<sup>1</sup>

<sup>1</sup> Dept. of Biology, Pomona College

<sup>2</sup> Molecular Biology, Pomona College

Corresponding Author: Nina J. Karnovsky (nina.karnovsky@pomona.edu)

The purpose of this study was to investigate the impact of rockweed presence on intertidal species diversity. Rockweeds are primary producers and important habitat formers. Due to their important ecosystem functions, they are known as ecosystem engineers, increasing community diversity and stability. This led us to hypothesize that rockweed presence in intertidal communities is correlated with increased macroinvertebrate diversity. We carried out this study at Shaw's Cove in Laguna Beach using quadrats placed along transects in three intertidal zones (high, mid, low). We then evaluated the rockweed percent cover and macroinvertebrate diversity in each quadrat. We did not find a significant correlation or clear pattern in species richness and rockweed percent cover. Our results do not align with other studies about the impact of rockweed presence on species diversity. However, these studies have utilized "rockweed" versus "non-rockweed" sites. The results of this study could indicate that the overall presence of rockweed influenced the species richness of all plots, showing limited effects in micro-habitats.

### 104. DOES KELP ABUNDANCE AND PERSISTENCE INFLUENCE FISH TROPHIC RELATIONSHIPS AND COMMUNITY COMPOSITION?

Kara Stella<sup>1</sup>

<sup>1</sup> Department of Biology, California State University Northridge

Corresponding Author: Kara Stella, Department of Biology, California State University Northridge (kara.stella.048@my.csun.edu)

Many studies have focused on how kelp abundance and structural complexity cultivate high biodiversity and stable food webs; however, the role of kelp persistence (its stability and continuity throughout time), remains unclear. My study will determine how variation in the persistence and abundance of giant kelp (*Macrocystis pyrifera*) affects trophic relationships of three predatory reef fish and fish community biodiversity. I will collect fish across forests with varying kelp persistence and abundance to analyze their diets using visual stomach assays and estimate their trophic positions using stable isotope analyses. I will also evaluate the energetic and reproductive condition of these fish by calculating their gonadosomatic and hepatosomatic indices. Lastly, I will measure the fish species richness and abundance at each collection location. By clarifying how habitat stability shapes fish diets, energetic condition, reproductive output, and trophic relationships, my study will provide insight relevant to the management and restoration of kelp forests experiencing increased disturbance and variability.

### 105. EXPLORATORY ANALYSIS OF 20+ YEARS OF KELP FOREST COMMUNITY STRUCTURE DATA FROM THE SBC LTER PROGRAM

Bengt Allen<sup>1</sup>, Lana Carter<sup>1</sup>, Alexis Coddling<sup>1</sup>, Shannon Kingery<sup>1</sup>, Kira Miller<sup>1</sup>, Tai Nguyen<sup>1</sup>, Alexandre Steffen<sup>1</sup>

<sup>1</sup> Department of Biological Sciences, California State University, Long Beach

Corresponding Author: Bengt Allen, Department of Biological Sciences, California State University, Long Beach  
(Bengt.Allen@csulb.edu)

Giant kelp (*Macrocystis*) is among the fastest growing plants found on earth. Reaching from the seafloor to the ocean surface, it provides extensive vertical habitat that is the foundation for one of the most species-rich, productive, and widely distributed ecological communities in the world. The Santa Barbara Coastal Long Term Ecological Research (SBC LTER) site is an interdisciplinary program established in 2000 to understand the ecology of southern California coastal kelp forest ecosystems. We used data from their ongoing 20+ year monitoring at 11 sites to explore a variety of ecological theories about how natural communities are structured and function. We evaluated the presence and/or strength of trophic cascades, biodiversity-ecosystem function relationships, correlations between species and functional group diversity, links to local and regional climate drivers, and more. Although many hypotheses were supported, others were not – even those generated from other kelp forest datasets. Overall, our results highlight the importance of repeating previous analyses and suggest that large-scale observational data can be an informative complement to small-scale experimental manipulations, particularly when replicating a given experiment in the field would be difficult or impossible.

#### 106. ASSESSMENT OF FISH COMMUNITY CORRELATES IN A SOUTHERN CALIFORNIA SALT MARSH

Cloe Christensen, Jessica Woody<sup>1</sup>, Christine Whitcraft

<sup>1</sup> Biological Sciences Department, California State University, Long Beach

Corresponding Author: Jessica Woody, Biological Sciences Department, California State University, Long Beach  
(jwoody899@gmail.com)

Coastal wetlands provide key ecosystem services, including breeding grounds, foraging sites, and refuges for native fish species. Despite this importance, wetlands are highly susceptible to anthropogenic impacts such as run-off, development, and hydrologic alterations. Understanding what wetland features support fish populations is critical to effective management and conservation. Our project evaluates sediment type, submerged aquatic vegetation, and bathymetry, which likely correlate with fish abundance and community composition. Substrate type indirectly affects fishes' habitat by sand or mud's ability to support eelgrass beds, which provide usable habitat for spawning, fish rearing, and foraging. Bathymetry varies widely across the channel, thus affecting the habitat and light availability for primary producers, such as eelgrass. Our project hypothesizes that fish species richness is higher in marshes with a variety of channel habitat, sandy and muddy areas as well as open and eelgrass-dominated areas. Our results show that smaller benthic fish are found in muddier sections regardless of eelgrass presence, while ambush predators and pelagic fish are found near the edges of eelgrass where it is sandier. In addition, community composition varies with eelgrass presence, depth range, and sediment type. Researching these features together with the fish community is important to our understanding of what wetland features support the diverse network of native fish assemblages.

#### 107. CORRELATIONS BETWEEN INLET STATUS, OPENING FREQUENCY, AND FISH COMMUNITIES WITHIN ESTUARIES

Fernando Gutierrez<sup>1</sup>, Christine Whitcraft<sup>1</sup>

<sup>1</sup> Biological Sciences Department, California State University Long Beach

Corresponding Author: Fernando Gutierrez, Biological Sciences Department, California State University Long Beach  
(Fernando.Gutierrez02@student.csulb.edu)

Intermittently closed estuaries (ICEs) are a special type of wetland constituting about 3% of estuaries worldwide; They typically occur along the coast in Mediterranean climates like California. These wetlands provide critical ecosystem functions and services like prevention of coastal flooding and erosion, high primary productivity, and support for biodiversity. With 95% of wetlands in California gone, their ability to protect our coastlines, purify our water, and provide crucial shelter and nurseries for species, including those endemic/endangered, have been severely reduced. A

lesser known question about these wetland ecosystems is how the provision of these services varies between the open (connected to ocean) and the closed states, where their connection to the ocean dries up for part of the year. Thus, my project addresses whether there are differences in ratios of invasive to native fish among wetland types based on the percent of time an inlet is open versus closed. I hypothesize that perennially open estuaries will have higher levels of invasive fish than intermittently closed estuaries. Preliminary data shows that community composition varies with overall inlet type and that, in addition to higher overall abundances, perennially open estuaries have more invasive species. This study shows that ICEs have value outside of just their standard open state, and that their closed states may provide unseen benefits for ecosystem regulation.

#### 108. PLANT PREFERENCES OF INTRODUCED RED-CROWNED AMAZONS IN SOUTHERN CALIFORNIA

Reagan Bean<sup>1</sup>, Diego Blanco<sup>1</sup>, John McCormack<sup>1</sup>, Brenda Ramirez<sup>1</sup>

<sup>1</sup> Moore Laboratory of Zoology, Department of Biology, Occidental College

Corresponding Author: Diego Blanco, Moore Laboratory of Zoology, Department of Biology, Occidental College (blanco@oxy.edu)

The Red-crowned Amazon (*Amazona viridigenalis*) is a range-restricted species in northeastern Mexico, where its native range encompasses a mix of temperate forest, tropical forest, scrubland, and human-associated environments. Several introduced or naturalized populations occur in association with urban areas, with the largest at nearly 4,000 individuals found in southern California. Habitat availability and preference varies both within the species' native range and across its introduced ranges, suggesting a degree of ecological plasticity mediated by parallel introductions of non-native plant species in areas where Red-crowned Amazons have naturalized. We used a set of photographic observations ( $n = \sim 1,200$ ) sourced from iNaturalist to quantify plant species associated with Red-crowned Amazons in perching, feeding, and nesting events in Los Angeles. We found a strong association ( $\sim 75\%$  of observed perching events) with introduced tree species and human-made structures, with an additional emphasis on the Western Sycamore (*Platanus racemosa*), a native species, in  $\sim 25\%$  of observed perching and  $\sim 38\%$  of feeding events. Our results illustrate the dependence on introduced plant species by Red-crowned Amazons in Los Angeles and add to recent findings that suggest Western Sycamores play an outsized role in supporting introduced parrot species across southern California.

#### 109. PLASTIC INGESTION OF TRANSLOCATED BLACK-FOOTED ALBATROSS CHICKS

Shiori Terretta<sup>1</sup>, Liliana Costello-Wiginton<sup>1</sup>, Brooke Bailey<sup>2</sup>, Nina Karnovsky<sup>2</sup>, Lyndsay Young<sup>3</sup>

<sup>1</sup> Department of Natural Sciences, Pitzer College

<sup>2</sup> Department of Biology, Pomona College

<sup>3</sup> Pacific Rim Conservation

Corresponding Author: Shiori Terretta, Department of Natural Sciences, Pitzer College (sterrett@students.pitzer.edu)

The purpose of this study was to analyze the diet composition of black footed albatross (*Phoebastria nigripes*/Ka'upu). We examined the diets of translocated chicks moved from Midway Island to a higher elevation area of O'ahu. These birds needed to be translocated due to sea level rise. We dissected 11 boluses collected in 2020 and sorted the contents into natural and non-natural categories. For each item, we recorded both wet and dry mass, as well as volume displacement in water. Common natural diet items included upper and lower squid beaks and pumice, while less frequent items included fish lenses. Among non-natural materials, we observed various colors of plastics in all but one bolus. We observed notable patterns in the color distribution of ingested plastics. Specifically, white plastic made up around 32% of the total numbers of plastic pieces, transparent plastic accounted for 15%, and brown plastic accounted for 14%. Other commonly found materials included pieces of fishing line and wood. Less common non-natural items included foam. We found that black footed albatross chicks ingest a substantial amount of plastic. The average non-natural mass of a bolus was 5.45 g, whereas the average natural mass was only 3.40 g. This reflects the high plastic content present in the feeding areas of the adults, which includes the greater Pacific Ocean region. This study highlights the plastic burden that these chicks have been fed before translocation.

## 110. SCAFFOLD-AWARE DRUG POTENCY PREDICTION: COMPARATIVE EVALUATION OF TRANSFORMER ARCHITECTURES AND STACKED ENSEMBLE METHODS FOR LDHA PIC50 PREDICTION

Darren Phan<sup>1</sup>

<sup>1</sup> Milpitas High School

Corresponding Author: Darren Phan, Milpitas High School (darren.dp.phan@gmail.com)

Lactate Dehydrogenase A (LDHA) is a critical enzyme in cancer metabolism, catalyzing the final step of the Warburg effect. Despite representing a high-priority therapeutic target for over two decades, no LDHA inhibitor has received clinical approval. This study presents a comparative evaluation of an array of machine learning models, spanning tree-based ensemble methods and transformer architectures, for Quantitative Structure-Activity Relationship (QSAR)-based pIC<sub>50</sub> prediction. A total of 554 experimentally validated LDHA inhibitors were sourced from ChEMBL, and molecular descriptors were computed using the Mordred cheminformatics library, yielding 93 features after variance threshold filtering. Metalearner v2, a stacked ensemble combining ExtraTrees, LightGBM, and Random Forest with an ElasticNet meta-learner, achieved the strongest predictive performance ( $R^2=0.845$ , MAE=0.451, RMSE=0.662), outperforming all transformer variants including TabTransformer, FT-Transformer, and SAINT. Scaffold-aware validation via Bemis-Murcko splitting revealed a critical generalization gap, with  $R^2$  dropping to 0.662 on structurally novel scaffolds. SHAP analysis identified GhoseFilter as the dominant predictive descriptor (importance=0.209), confirming drug-likeness as the primary determinant of LDHA inhibitor potency. These findings carry direct implications for model selection in low-data drug discovery settings.

## 111. PROTECTION WITHOUT PREFERENCE: GREEN SEA TURTLE HABITAT USE AND ALGAL ASSOCIATIONS AROUND CATALINA

Lilyana Contreras<sup>1</sup>

<sup>1</sup> Marine Biology Department, California State University Long Beach

Corresponding Author: Lilyana Contreras, Marine Biology Department, California State University Long Beach (Lilyana.Contreras01@student.csulb.edu)

Green sea turtles (*Chelonia mydas*) have recently recovered from “Endangered” to “Least Concern,” yet their ecology in temperate habitats remains poorly understood. This study examined how algal community structure and protection status influence green sea turtle distribution and foraging presence around Santa Catalina Island. Using NOAA’s West Coast Sea Turtle Sightings dataset, turtle presence was compared between marine protected and unprotected areas. Algal surveys were conducted at 15 coastal sites to assess relationships between turtle sightings and algal percent cover, species diversity, and preferred food sources (eelgrass, green algae, and *Plocamium*). Although most of the 75 turtles observed were reported within marine protected areas, statistical analyses showed no significant difference in turtle frequency between protected and unprotected sites. Correlation analyses also revealed no significant relationships between turtle sightings and total algal cover, species diversity, eelgrass, or *Plocamium*. The only significant result was a strong negative correlation between green algae presence and turtle frequency. Overall, findings suggest that green sea turtles around Catalina do not select habitats based on protection status or algal composition alone. Other factors, such as foraging specialization, temperature, or additional ecological drivers, may better explain observed distribution patterns.

## 112. SUNKISSED SOLUTIONS : HARNESSING SUNFLOWERS FOR PRACTICAL NICKEL EXTRACTION AND SOIL RESTORATION

Jackeline Godinez Gonzales<sup>1</sup>, Annika Harusadangkul<sup>1</sup>, Parker Evans<sup>2</sup>, Steven Wei<sup>1</sup>, Adriane Jones<sup>2</sup>, Diane Kim<sup>3</sup>

<sup>1</sup> Environmental Studies Department, University of Southern California

<sup>2</sup> Biological Sciences Department, Mount Saint Mary’s University of Los Angeles

<sup>3</sup> Wrigley Institute and Environmental Studies Department, University of Southern California

Corresponding Author: Jackeline Godinez Gonzales, Environmental Studies Department, University of Southern California (jg81963@usc.edu)

Sunflower phytomining, the process of sunflowers uptaking metals, offers a sustainable alternative to traditional methods that are carbon-intensive and polluting. In this study, we screened the phytomining potential of 360 sunflower strains and present a subset of processed samples here. Sunflowers were selected based on their ability to hyperaccumulate metals, biological and genetic resources available, large biomass, and fast growth rates. The 360 sunflower strains screened in this study were cultivated by hybridizing wild sunflowers and highly cultivated strains and were challenged in 500 ppm of nickel under otherwise ideal growth conditions in soil and grown in a greenhouse for 35 days from March 21st to April 25th, with 6 replicates per strain. At the end of the exposure trial, plants were measured, harvested, and dried at 60°C for 48 hours. We selected 60 samples based on height, including the 20 largest and 20 smallest, along with 20 random strains for initial Ni measurements and present those results here. Dried biomass was crushed using a mortar and pestle, sieved through a 200 um nylon screen and analyzed using an XRF analyzer to determine the concentration of nickel. Nickel concentrations of selected strains ranged between 200 to 1220 ppm, demonstrating substantial variability in metal accumulation and highlighting high-performing strains. This preliminary data set also suggests that highest nickel accumulation may not be limited to the tallest or shortest plants.

### 113. DO ROSE LEAF TRAITS PREDICT DROUGHT PERFORMANCE?

Mia Ceja<sup>1</sup>, Dr. Darren R. Sandquist<sup>1</sup>

<sup>1</sup> Department of Biological Science, California State University, Fullerton

Corresponding Author: Mia Ceja, Department of Biological Science, California State University, Fullerton (miaceja29@csu.fullerton.edu)

Water availability is an important factor influencing plant performance, especially in arid and semi-arid regions like Southern California. Roses are widely cultivated ornamental plants, and understanding functional traits associated with water use and performance can help identify cultivars that can withstand low water conditions for use in sustainable landscaping. The American Rose Trials for Sustainability (ARTS) planted 30 rose cultivars to evaluate rose performance under drought conditions. Our study explores variation among these cultivars in leaf functional traits, including intrinsic water use efficiency based on stable carbon isotope ratios ( $\delta^{13}\text{C}$ ), chlorophyll fluorescence, chlorophyll content and leaf mass per area (LMA).  $\delta^{13}\text{C}$  values and LMA varied widely among cultivars, but there was no statistical relationship between the two. This suggests that structural leaf traits alone are not the best predictors for long-term water use efficiency in cultivated roses and that variation may be better described by other leaf or whole-plant attributes. Future analyses will examine how leaf-level functional traits compare to ARTS performance metrics with the hope that they may help inform selection of cultivars that are better suited to arid or semi-arid environments.

### 114. ENHANCED FENTANYL SELF-ADMINISTRATION FOLLOWING NICOTINE EXPOSURE IN A RODENT MODEL

Ananya Devkirti<sup>1</sup>, Shahradd Lotfipour<sup>1</sup>

<sup>1</sup> Department of Emergency Medicine, University of California Irvine

Corresponding Author: Ananya Devkirti, Department of Emergency Medicine, University of California Irvine (ananyadevkirti@gmail.com)

Electronic cigarette usage containing nicotine has surged dramatically among adolescents. Animal research indicates that nicotine administration during early adolescence, but not in mature animals, elevates later drug consumption and reinforcement behaviors. Despite evidence linking adolescent nicotine consumption to increased vulnerability for subsequent substance abuse, limited research has examined how adolescent nicotine exposure influences adult opioid-seeking behavior. This study aimed to establish an animal model evaluating the impact of adolescent nicotine

exposure on later opioid intake. We employed a validated 4-day nicotine protocol, administering rats two intravenous injections of either nicotine ( $2 \times 30 \mu\text{g}/\text{kg}/0.1 \text{ mL}$ ) or saline during either early adolescence (postnatal days 28-31) or adulthood (postnatal days 86-89). Beginning on postnatal day 32 or 90, subjects engaged in operant intravenous self-administration sessions with fentanyl ( $2.5 \mu\text{g}/\text{kg}/\text{inf}$ ). Results revealed that early-life nicotine exposure increased fentanyl self-administration across both sexes, while adult exposure produced no such effect. These results indicate that adolescence represents a critical developmental window of heightened susceptibility to nicotine's priming effects on fentanyl self-administration behavior, providing support for gateway drug hypotheses.

## 115. INVESTIGATING CROSS MODAL RELATIONSHIPS IN PATTERN DISCRIMINATION

Vera Yang<sup>1</sup>

<sup>1</sup> Sage Hill School

Corresponding Author: Vera Yang, Sage Hill School (veraocyanayang@gmail.com)

Pattern discrimination is the process in which the brain compares sensory inputs and detects differences in their features, allowing individuals to distinguish between similar stimuli such as color, or scent. While information for each modality is processed by distinct neural pathways, it remains uncertain whether pattern discrimination ability across the modalities are related. This study aims to investigate whether high performance in one sense is also shown in another. Because of logistical constraints, it was only possible to assess the relationship between visual and auditory pattern discrimination, as it was possible to maintain precise stimulus control in a virtual environment. Participants ( $n = 27$ , ages 12–79) completed an online perceptual task consisting of both visual and auditory comparisons, with stimulus both above and below the threshold for the JND (just noticeable difference). Individuals who performed well on visual tasks also often performed highly on the auditory portion as well, suggesting there may exist a cross-modal relationship in perceptual discrimination ability. Although more research is needed to confirm results across all five sensory modalities, these findings suggest that although early sensory processing occurs within modality-specific neural pathways, pattern discrimination performance may also rely on shared higher-order mechanisms involved in perceptual comparison.

## 116. THE EFFECT OF FEATHER MICRO- AND NANO-STRUCTURE ON PLUMAGE SEXUAL DICHROMATISM IN TANGARA TANAGERS

Maeve Secor<sup>1</sup>, Rosalyn Price-Waldman<sup>2</sup>, Matt Dean<sup>3</sup>, Allison Shultz<sup>4</sup>

<sup>1</sup> University of Southern California, Molecular Biology Department and Natural History Museum of Los Angeles County, Ornithology

<sup>2</sup> Princeton University, Ecology and Evolutionary Biology

<sup>3</sup> University of Southern California, Molecular and Cellular Biosciences

<sup>4</sup> Natural History Museum of Los Angeles County, Ornithology

Corresponding Author: Maeve Secor, University of Southern California, Molecular and Cellular Biosciences and NHMLAC, Ornithology Department (msecor@usc.edu)

Sexual dimorphism in color is widespread in animals, yet the structural mechanisms underlying sex-specific coloration remain poorly understood. In birds, males and females often share broad pigmentary or structural coloration mechanisms but still differ in hue, brightness, and saturation. This suggests that fine-scale feather architecture may drive dichromatism. We tested whether variation in feather micro- and nanostructure explains sexual color differences in 26 species of Tangara tanagers, a Neotropical radiation known for pronounced male ornamentation. We quantified reflectance spectra from seven plumage patches per sex and modeled color in avian tetrahedral color space. Crown, rump, epaulet, and back patches showed the greatest male–female divergence. For these patches, we measured feather microstructure with confocal microscopy and quantified barb cross-sectional geometry to capture three-dimensional shape. Coloration mechanisms were classified as pigmentary, structural, or combined using spectrophotometry and cross-sectional imaging. Bayesian phylogenetic mixed models tested how structural traits predict the magnitude of dichromatism across species. By integrating feather structure with avian visual modeling in a phylogenetic framework, this work reveals how subtle architectural differences generate sex-specific ornamentation and provides a mechanistic

foundation for understanding plumage evolution.

#### 117. HOW STUDYING LARVAL FISH CAN IMPROVE FOOD SECURITY IN OUR URBAN OCEAN

Marty Valdez<sup>1</sup>, Daniel Pondella<sup>1</sup>, Natalie Shubin<sup>2</sup>, Bri Goodwin<sup>3</sup>

<sup>1</sup> Vantuna Research Group, Occidental College

<sup>2</sup> Biological Sciences Department, Cal Poly Pomona

<sup>3</sup> Strategic Earth Consulting

Corresponding Author: Marty Valdez, Vantuna Research Group, Occidental College (martinezvaldez@oxy.edu)

While the West Coast's Southern California Bight (SCB) is home to a diverse number of fish populations, it also serves as a means for underserved communities to fish for sustenance. While this anthropogenic relationship has had a historical trend with the SCB, the amount of strain from commercial development and population growth is impacting the area, and minimal research has been done on subsistence fishing and underserved communities. Pier angler surveys will investigate personal histories, community food security, perspectives on historical environmental changes, target species, and their catch quality. This project aims to understand prospective trends on specific taxa and their populations' surrounding environment over the past half-century by conducting outreach with local anglers to gather data on their fishing history and how that might have shaped their perspectives about the SCB. By connecting personal testimonies to a 52-year nearshore ichthyoplankton dataset collected by the Vantuna Research Group at Occidental College, we will analyze fish populations and their correlation to food security. We will compare trends of specific taxa's densities between the ichthyoplankton densities and the adult stocks to identify an association between both. From our data collection, we will establish whether resources are increasing or decreasing over the last half-century and the role fishery regulations, oceanographic variation, and climate change have played.

#### 118. FROM GENES TO STREAMS: MITOCHONDRIAL APPROACHES TO POPULATION MONITORING OF THE SANTA ANA SUCKER

Mariana Antonio<sup>1</sup>, Joseph Heras<sup>1</sup>

<sup>1</sup> College of Natural Science, California State University, San Bernardino

Corresponding Author: Mariana Antonio, College of Natural Science, California State University, San Bernardino (006266633@coyote.csusb.edu)

This project implements environmental DNA (eDNA) metabarcoding to detect the presence of the Santa Ana sucker (*Catostomus santaanae*) across streams in Southern California. By designing custom DNA primers from the mitochondrial genome, we aim to improve fish species identification in diverse habitats. This eDNA approach introduces non-invasive biodiversity assessment and contributes to conservation efforts for this threatened species

#### 119. GENETIC ASSIGNMENT OF UNKNOWN AND MISIDENTIFIED BANANA SLUG SAMPLES USING GENOMIC DATA

Sophia Badillo<sup>1</sup>, Julian Banuelos Torres<sup>1</sup>, Cassandra Jordan<sup>1</sup>, Janet Leonard<sup>2</sup>, Jann Vendetti<sup>3</sup>, Sergio Nigenda-Morales<sup>1</sup>

<sup>1</sup> Department of Biological Sciences, California State University San Marcos

<sup>2</sup> Institute of Marine Sciences, University of California, Santa Cruz

<sup>3</sup> Malacology Department, Natural History Museum of Los Angeles County

Corresponding Author: Sergio Nigenda-Morales, Department of Biological Sciences, California State University San Marcos (snigenda@csusm.edu)

Genetic data are used to resolve phylogenetic relationships, to perform taxonomic assignments of samples with unknown origins, and to clarify taxonomic uncertainties. Next-generation sequencing and genomic technologies enable the analysis of thousands of genetic variants across the genome, increasing the resolution of genomic assignment. Six banana slug species (genus *Ariolimax*) have been described based on reproductive morphology. We used genomic data to assign banana slug individuals of unknown origin to their most probable species and resolve taxonomic uncertainties that could not be clarified through morphology or collecting location. We analyzed 33 *Ariolimax* samples. Of these, 23 had previously been assigned to one of the six species based on collection location or morphology, 6 were taxonomically uncertain because they could not be confidently assigned to a single species, and 4 had no prior species assignment. Using double digest restriction-site associated DNA sequencing (ddRAD-seq), we analyzed 190,000 single-nucleotide polymorphisms (SNPs). We assessed genetic variation, degree of differentiation among species and conducted ordination, clustering, and phylogenetic analyses. We were able to assign all individuals of unknown origin or uncertain taxonomy to their most probable species. Additionally, we identified inconsistencies in previous identifications. Our results demonstrate the importance of genome-wide data for resolving taxonomic inconsistencies.

## 120. LEVERAGING PLANT TRAITS FOR HEDGEROW SPECIES SELECTION IN SOUTHERN CALIFORNIA AGRICULTURE

Kyle D. Osornia<sup>1</sup>, Francine Nikolai A. Salvador<sup>1</sup>, Elizabeth M. Garcia<sup>1</sup>, Corey E. Kelsey<sup>1</sup>, Emily Montes<sup>1</sup>, Erin Questad<sup>1</sup>

<sup>1</sup> Biological Sciences Department, California State Polytechnic University, Pomona

Corresponding Author: Kyle D. Osornia, Biological Sciences Department, California State Polytechnic University, Pomona (kdosornia@cpp.edu)

Native hedgerows are used in integrated pest management programs to enhance pollination and natural biocontrol, yet their performance varies widely. A trait-based approach may provide insight into this variability by identifying plant traits that influence arthropod community assemblages. We evaluated plant trait-arthropod relationships in hedgerows within citrus and avocado orchards in California's Santa Clara River Valley. Seven species were sampled in 2025 for functional traits related to growth, floral resources, leaf economics, and water relations. Arthropods were surveyed using visual surveys and vacuum sampling and identified to the lowest possible taxonomic level. Using generalized linear mixed models, we tested whether plant traits explain variation in arthropod richness and abundance. Preliminary results from 100 plants indicate that pollinator and pest abundance and richness increased with floral density, and pollinator abundance also increased with plant volume. In contrast, natural enemy responses increased with physiological and leaf traits: enemy abundance increased with leaf dry matter content (LDMC), while enemy richness increased with higher predawn water potential, photochemical efficiency, and LDMC. These findings suggest that selecting species for high floral output may enhance pollinators but also elevate pests, whereas physiological and leaf traits are more closely linked to natural enemy diversity, highlighting tradeoffs in trait-based hedgerow design.

## 121. ROADRUNNER AND GARDEN SNAIL DENSITY RELATIONSHIPS IN SANTA MONICA MOUNTAINS

William Haddock<sup>1</sup>, Dr. Brenton Spies<sup>1</sup>

<sup>1</sup> Environmental Science and Resource Management, California State University of Channel Islands.

Corresponding Author: William Haddock, Environmental Science and Resource Management, California State University of Channel Islands. (william.haddock432@myci.csuci.edu)

Information on Greater Roadrunners' (*Geococcyx californianus*) diet is limited, especially unknown regarding their relationship and consumption of snails. Greater Roadrunners are found in Mediterranean chaparral climates, making the Santa Monica Mountains prime habitat. To investigate this relationship, we surveyed a variety of different habitat types using belt and quadrat surveys in the Santa Monica Mountains National Recreation Area looking at dead snails (shells) and living snail (snails) counts. We deployed 10 camera traps intermittently in the four habitats (cacti scrub, coyote brush, depression wetland, and field) from October 2025 to February 2026 to identify roadrunner presence/absence. Shell and snail presence varied greatly between habitat types; the coyote brush contained the most shells of all the types

( $\bar{x}$ =0.66 shells per m<sup>2</sup> ± SE=0.11) while the wetland contained more abundant snails ( $\bar{x}$ =0.054 snails per m<sup>2</sup> ± SE=0.017). The roadrunners spent the majority of their time in the cacti ( $\bar{x}$ =0.56 roadrunners sighting per camera-days effort), but were seen in the coyote brush far more than the wetland (coyote brush  $\bar{x}$ =0.39, wetland  $\bar{x}$ =0.15). There is visible overlap between the roadrunners and snails, but both prefer different habitats. The roadrunners are visually observed eating more snails in the coyote brush, however, both species do not appear to be the sole indicator of each other's presence.

## 122. POLLINATOR OBSERVATION DISPARITY BETWEEN INATURALIST AND FIELD RECORDING

Ryan Prem<sup>1</sup>, Mia Arzola Hinderliter<sup>1</sup>, Joshua Mendez<sup>1</sup>, Brenton Spies<sup>1</sup>

<sup>1</sup> Environmental Science and Resource Management Program, CSU Channel Islands

Corresponding Author: Ryan Prem, Environmental Science and Resource Management Program, CSU Channel Islands (ryan.prem755@myci.csuci.edu)

Pollinators are in a global decline. This is caused by the loss of habitat, climate change, and being outcompeted by invasive species. In the Santa Monica Mountains, there are several active restorations to either directly or indirectly sustain the pollinator population. We monitored the progression of a restoration project in the Satwiwa/Rancho Sierra Vista region of the park. By directly observing and employing the help of citizen science projects through iNaturalist. Direct observation was conducted at sites that have been restored and at another site that has not been restored to compare results. iNaturalist data was pulled through a collection of insects in the area. Results show that the distribution of pollinators is different between the iNaturalist and direct observation data. Flies are significantly less represented compared to observations in the field by us. Bees and butterflies are found in both methods of collection, but they are much more observed in the iNaturalist data. Because of the nature of iNaturalist, citizens who take the time to record observations are subject to selection bias toward insects they find more interesting. This should be taken into account when assessing the diversity. What iNaturalist is good at is highlighting what brings interest to the region. By knowing what species are prevalent and active in spaces where nature and humans meet. In this case, most observations were found on trails.

## 123. EFFECT OF VENTRAL SUPPORT ON SUB-LEGAL TIVELA STULTORUM IN SEDIMENT-FREE AQUACULTURE SYSTEMS

Cooper Chen<sup>1</sup>, Capt. Nancy L. Caruso<sup>2</sup>, Kenton Buck<sup>1</sup>

<sup>1</sup> Tarbut V' Torah Community Day School

<sup>2</sup> Get Inspired, Inc.

Corresponding Author: Cooper Chen, SCAS RTP Student, Tarbut V' Torah Community Day School (cooper.y.chen@gmail.com)

Populations of the Pismo clam, *Tivela stultorum*, remain low along the Orange County, California coast despite harvest regulations. Variable recruitment and slow growth may constrain recovery. Although prior work demonstrated short-term sediment-free maintenance of adults using lateral shell contact, structural requirements for stabilizing sub-legal individuals without sediment remain untested. This study evaluates whether continuous ventral support improves the survival, growth, and behavioral stability of sub-legal clams in a sediment-free culture system. Custom 3D-printed holders were engineered to provide identical lateral constraints while differing only in the presence or absence of ventral support. Experiments were conducted across three aquaculture systems: one recirculating system with supplemental feeding and two flow-through systems supplied with filtered and unfiltered seawater. Individual clams served as experimental units. Longitudinal measurements included shell morphometrics, wet weight, survival, displacement events, siphon extension, and non-invasive responsiveness. Preliminary observations indicate more frequent downward displacement in unsupported holders, suggesting ventral contact enhances positional stability. Final analyses compare survival trajectories, growth trends, and behavioral consistency across treatments to inform scalable sediment-free rearing designs for conservation aquaculture.

## 124. DNA DAMAGE RESPONSE AND CHROMATIN REMODELING MUTATION ANALYSIS IN PANAMANIAN BREAST CANCER PATIENTS

Madison Stark<sup>1</sup>

<sup>1</sup> Crean Lutheran High School

Corresponding Author: Madison Stark, Crean Lutheran High School (madison.nicole.stark@gmail.com)

Breast cancer, one of the most common cancers worldwide, is a genetically complex disease caused by a variety of mechanisms and pathways with mutation patterns that vary between ethnic populations. Large cancer genomics databases such as The Cancer Genome Atlas (TCGA) are heavily composed of populations of European ancestry, creating gaps in scientific understanding of tumor biology for other racial and ethnic groups including Central American populations. As cancer interventions become more personalized this lack of understanding can adversely impact the effectiveness of cancer detection and treatment for these under researched populations. In this study, pathway-level analysis of tumor-specific variant data from 73 Panamanian breast cancer patients was performed using the Tempus xT platform and compared to similar patients of European ancestry. The study identified alteration frequencies in the DNA damage response (DDR) pathway and the SWI/SNF (BAF) chromatin remodeling complex. Pathogenic and likely pathogenic somatic variants were included, while variants of uncertain significance (VUS) were excluded. ATM and ARID1A were studied as central factors of the DDR and BAF pathways. When compared to TCGA breast cancer data, ATM (6.8%) and ARID1A (12.3%) showed notably higher mutation frequencies, while most other signaling pathway proteins showed similar frequencies between populations. In addition, ATM and ARID1A alterations were rarely found within the same patients. These

## 125. GLOBALIZING SUNSCREEN: IDENTIFYING VIABLE GLOBAL UV FILTERS THROUGH COMPARATIVE REGULATORY ANALYSIS

Katie Chang<sup>1</sup>, Dr. Deidre Gormley<sup>2</sup>

<sup>1</sup> Sage Hill School

<sup>2</sup> Dr. Deidre Gormley

Corresponding Author: Katie Chang, Sage Hill School (katiektchang@gmail.com)

91% of U.S. melanomas are linked to UV radiation exposure, underscoring the critical need for effective sun protection. Regulatory barriers in the U.S. restrict the approval and use of sunscreen active ingredients that are available internationally, slowing sunscreen innovation and limiting the UV protection available in U.S. markets. This study uses regulatory analysis and comparative data to investigate how differences in UVA and UVB protection profiles of sunscreen actives influence the overall efficacy of broad-spectrum sun protection approved in the U.S. compared with markets across Canada, Europe, and Australia. Each ingredient is classified as a physical or chemical UV filter and is analyzed according to its absorption range across UVA (320-400nm) and UVB (280-320 nm) wavelengths. UVA radiation penetrates deeper into the dermis and contributes to long-term photoaging and melanoma development. Commercial sunscreen formulations are examined to compare how UVA and UVB active ingredients are incorporated across global markets. By identifying differences in available UV filters and formulas, this study highlights the challenges limiting sunscreen development in the U.S. and proposes optimal ingredients based on globally approved sunscreen actives. The optimal global sunscreen is not defined only by UV protection, but by the compatibility of active ingredients across various regulatory markets, enabling formulations that are both scientifically effective and globally viable.

## 126. CELL-TYPE-SPECIFIC INTEGRIN/CSPG EXPRESSION AS A PREDICTOR OF SPINAL CORD INJURY RECOVERY

Maxwell Lee<sup>1</sup>

<sup>1</sup> Sage Hill School

Corresponding Author: Maxwell Lee, Sage Hill School (maxwell0539@gmail.com)

Spinal cord injury (SCI) disrupts the balance between growth-promoting integrins and growth-inhibitory chondroitin sulfate proteoglycans (CSPGs), yet cell-type-specific integrin/CSPG expression ratios remain uncharacterized at single-cell resolution. Using publicly available scRNA-seq datasets (GSE162610, GSE45376, and Figshare 17702045), we computed integrin/CSPG log ratios across [N cells, N cell types, X timepoints]. In GSE162610, OPCs exhibited strongly negative ratios (median  $\approx -0.15$ ), indicating a CSPG-dominant inhibitory state, while microglia, pericytes, and endothelial cells showed consistently positive ratios. UMAP projections confirmed that elevated CSPG scores spatially co-localized with low integrin/CSPG log ratios. [Cross-dataset validation using GSE45376 and Figshare 17702045 confirmed these patterns across injury models and timepoints.] These results establish cell-type-specific integrin/CSPG ratios as a reproducible transcriptomic signature in SCI and provide a foundation for future prognostic biomarker development.

## 127. RESTORING MICROBIAL BALANCE IN ACNE THROUGH TARGETED BACTERIOPHAGE THERAPY

Cordelia Cieplucha<sup>1</sup>

<sup>1</sup> Sage Hill School

Corresponding Author: Todd Haney, Science Department, Sage Hill School (thaney@sagehillschool.org)

Acne vulgaris is linked to changes in the skin microbiome, particularly a higher abundance of the acne-associated *Cutibacterium acnes* phylotype IA1. Antibiotics like doxycycline are a common treatment option, but growing antibiotic resistance and disruption of the broader skin microbiome have raised interest in alternative approaches. Bacteriophage therapy, which targets specific bacterial strains, has been proposed as a treatment that may preserve microbiome balance more effectively. This project examines how bacteriophage therapy compares to doxycycline in controlling *C. acnes* population dynamics and the development of antibiotic resistance. A computational population model was built in NetLogo to simulate interactions between IA1 strains and other *C. acnes* phylotypes under different treatment conditions. Simulation outputs will also be analyzed in R to evaluate treatment effects on population proportions and resistance trends. To investigate how phage therapy might be delivered in practice, a hydrogel-based topical treatment concept will be designed using computer-aided design (CAD) and constructed as a physical prototype. An immunological analysis will also be conducted to examine how doxycycline and bacteriophage therapies may affect the inflammatory pathways involved in acne development. This project combines computational modeling, engineering design, and immunological analysis to investigate microbiome-targeted strategies for acne treatment.

## 128. ISOLATION, CLONING, & CHARACTERIZATION OF A DNF2 REGULATORY GENE HOMOLOG IN MELILOTUS ALBA

Alexandra M. Whitcomb<sup>1</sup>, Nancy A. Fujishige<sup>1</sup>

<sup>1</sup> Department of Biology, Frank R. Seaver College of Science and Engineering, Loyola Marymount University

Corresponding Author: Alexandra M. Whitcomb, Department of Biology, Frank R. Seaver College of Science and Engineering, Loyola Marymount University (awhitco3@lion.lmu.edu)

Legumes establish symbiotic relationships with rhizobacteria that convert atmospheric nitrogen (N<sub>2</sub>) into bioavailable nitrogen required for plant development. In *Melilotus alba* (White Sweetclover), nitrogen fixation occurs within specialized root nodules requiring coordinated regulation of host defense during infection pathway initiation. Previous work in *Medicago truncatula* identified the Defective in Nitrogen Fixation 2 (*DNF2*) gene as encoding a phosphatidylinositol-specific phospholipase C (PI-PLC) required for maintaining nitrogen-fixing nodules. However, *DNF2* had not been characterized in *M. alba*. This study aimed to isolate, clone, and characterize a putative *DNF2* homolog expressed in *M. alba* root nodules. Purified RNA from nodular tissues underwent reverse transcriptase-polymerase chain reaction (RT-PCR) to generate complementary DNA (cDNA) and amplify a candidate *DNF2* fragment using M13 primers. The fragment was ligated into a pGEM-T Easy vector and transformed

into *Escherichia coli*. Recombinant colonies were screened and sequenced. Sequence analysis and megaBLAST alignment revealed 96.09% identity to *DNF2* in *M. truncatula*, confirming homology to PI-PLC proteins. Preliminary In-situ hybridization suggests *DNF2* transcription in older nodules. These findings provide a foundation for future studies of conserved mechanisms in nodule maintenance and symbiotic nitrogen fixation.

#### 129. DOES TIDAL ELEVATION INFLUENCE INTERACTIONS BETWEEN NATIVE AND NONNATIVE OYSTER SPECIES?

Otto Martinez<sup>1</sup>, Danielle Zacherl<sup>1</sup>, Sarah Gilman<sup>2</sup>

<sup>1</sup> Department of Biological Science, California State University, Fullerton

<sup>2</sup> W. M. Keck Science Department of Scripps, Pitzer, and Claremont McKenna Colleges

Corresponding Author: Otto Martinez, Department of Biological Science, California State University, Fullerton (otto\_martinez@csu.fullerton.edu)

Olympia oysters, *Ostrea lurida*, were once prominent ecosystem engineers along the west coast of the United States before being overfished and replaced by the nonnative Pacific oyster, *Magallana gigas*. Remnant *O. lurida* populations now coexist with feral *M. gigas*, yet little research has studied how they interact where their tidal ranges overlap. Existing research has hinted at competition but *O. lurida* settle on *M. gigas* shells at tidal elevations above their typical distribution limit, suggesting *M. gigas* may facilitate a tidal range expansion. To confirm the nature of their relationship, *O. lurida* and *M. gigas* were placed on concrete tiles in both mono and mixed cultures of varying densities. These tiles were then set at a low and high tidal elevation, along their shared tidal range. Over a one year period, growth and survival will be measured monthly. Temperature loggers are placed at both elevations to confirm whether *M. gigas* is providing temperature relief. With *O. lurida* restoration becoming more prominent in recent years, understanding this relationship could help inform management strategies for both species.

#### 130. SUPER-DARK MUDS, INTRASTRATAL MICROBES, & GENESIS OF EXOTIC "EVAPORITES", PALEO-SEARLES LAKE, CA

Wallace B. Leatham<sup>1</sup>, Brice Murray<sup>2</sup>

<sup>1</sup> Dept. Geological Sciences, CSU San Bernardino, CA 92407

<sup>2</sup> Certerra (formerly RMA Companies), Rancho Cucamonga, CA 91730,

Corresponding Author: W.B. Leatham, (retired) Dept. Geological Sciences, CSU San Bernardino (bleatham@csusb.edu)

Muds below the red halobacterial-rich saline pools that cap much of the Searles paleolake sediments contain an extremely rare mineral assemblage, predominantly consisting of sulfate, carbonate, borate and halide minerals. The muddy clay acts as the impermeable growth medium for the assemblage, and in its subsurface unexposed state ranks among the darkest natural substances known, (i.e. Munsell values around N1). There are no significant sulfides or other indicators of reduced environments or anaerobic decomposition of organics. The greenish black colorant cannot be easily extracted from the mud clays. Upon exposure, the mud rapidly changes irreversibly to a very light greenish gray (N7 Munsell value). Based on experimentation, the color change is probably neither oxidation, nor thermally or pressure-induced, and is most probably related to UV absorption. One large cohesive >12 liter clump, stored in an aphotic bucket, produced enough gas to fluff the mud to at least 20% of its original volume. Using standard soil extraction techniques and PCR on a subsurface "virgin" mud clump indicates identifiable nucleotide base sequences are present in the mud. Black mud inclusions occur in along growth lines and along edge pressure shadows between crystal faces in the hanksite. Based on crystal superposition and inclusions Borax crystals grow on the hanksite, and borax usually is encased by nonpink halite when present.

#### 131. STAYING OR PASSING THROUGH? SPATIAL STRATEGIES OF BAT RAYS IN A WHITE SHARK NURSERY

Brayden C Ortiz<sup>1</sup>, Christopher G Lowe<sup>1</sup>

<sup>1</sup> California State University Long Beach Shark Lab, California State University Long Beach

Corresponding Author: Brayden C Ortiz, California State University Long Beach Shark Lab, California State University Long Beach (braydencooperortiz@gmail.com)

Within a known white shark nursery habitat at Padaro Beach, California, bat rays (*Myliobatis californica*; n = 24), a primary prey species of juvenile white sharks (*Carcharodon carcharias*), were tracked using passive acoustic telemetry from September 9, 2021 to November 8, 2023. Using detections from an offshore acoustic array, we quantified habitat utilization through kernel utilization distributions (KUDs) to evaluate how bat rays use this shark aggregation site. Mean 95% kernel home range size was  $2.04 \pm 1.16$  km<sup>2</sup> (range: 0.08–5.41 km<sup>2</sup>), indicating substantial inter-individual variation in space use. Core areas (50% KUD) averaged 0.50 km<sup>2</sup> and comprised approximately 24% of total home range area, demonstrating concentrated and non-uniform use of space within the aggregation site. Core areas were frequently centered around rocky reef habitat, suggesting these areas may function as important foraging or resting zones. Overall, bat rays exhibited fine-scale, structured space use within the nursery habitat. Several individuals showed strong site fidelity, maintaining relatively small home ranges of less than 0.5 km<sup>2</sup>, while others displayed broader movement patterns of 5 km<sup>2</sup> consistent with transient use of the area within the Southern California Bight. This variation in spatial strategy may influence prey availability and spatial overlap with juvenile white sharks. These findings highlight how bat ray habitat utilization and residency varies among individuals.

132.-

### 133. ASTROCYTE-SYNAPSE PROXIMITY REGULATES GLUTAMATE UPTAKE

Shravya Bharathwaj<sup>1</sup>

<sup>1</sup> Westview High School

Corresponding Author: Emmet Francis, Pharmacology Department, University of California San Diego (eaf Francis@ucsd.edu)

Astrocytes regulate homeostasis in the central nervous system by controlling extracellular glutamate clearance. Communication between neurons and astrocytes is crucial considering synaptically-released glutamate binds to receptors on the postsynapse to depolarize the neuron. Glutamate is simultaneously removed from the extracellular space by astrocytes in order to terminate neuronal signals. Previous research has developed models of astrocyte-glutamate dynamics, but without considering the detailed effects of cellular and subcellular geometry. We hypothesize that neuronal shape, astrocyte shape, and membrane proximity are key regulators of extracellular glutamate removal. To test this, we constructed computational meshes from cell geometries directly derived from imaging data. We tested three different release sites on the presynapse: one within the synaptic cleft, one outside the cleft but still close to the post-synapse and astrocyte membranes, and one farther away from the membranes. The results showed that extracellular glutamate was taken up quickest by the astrocytes in the release site closest in proximity to the astrocyte. This suggests that the distance from the release site to the postsynaptic membrane and nearby astrocytic glutamate uptake is crucial in controlling how much glutamate is bound at the postsynapse. Future directions include using ordinary differential equation(ODE)-based approaches to simulate the effects of glutamate uptake on neuron excitability.

### 134. MITOCHONDRIAL DNA-BASED PHYLOGENY AND RADULAR MORPHOLOGY OF BANANA SLUGS (ARIOLIMAX SPP.)

Mary Torosyan<sup>1</sup>, Claire Markwalter<sup>2</sup>, Amber Justine Medeiros Hernandez<sup>1</sup>, Jann Vendetti<sup>3</sup>

<sup>1</sup> Department of Biological Sciences, Glendale Community College

<sup>2</sup> Biology Department, Pomona College

<sup>3</sup> Malacology Department, Natural History Museum of Los Angeles County

Corresponding Author: Jann Vendetti, Malacology Department, Natural History Museum of Los Angeles County

(jvendetti@nhm.org)

Banana slugs, the six described species belonging to the genus *Ariolimax*, are large terrestrial gastropods endemic to the western coast of North America. Although well known, their taxonomic relationships based on molecular data have not been published. Here, we present a mitochondrial DNA-based phylogeny of the six described *Ariolimax* species, which we compare to a nuclear DNA-based phylogeny generated by Dr. Sergio Nigenda-Morales and his students at California State University, San Marcos (our collaborators). We also examine the tooth structure of the feeding ribbon (radula) and jaw in *Ariolimax* species under Scanning Electron Microscopy (SEM). Jaw and radular features are not typically different between closely related stylommatophora (common slugs), but have yet to be closely examined in this genus.

### 135. MORPHOLOGY MAGNIFIED: POLLEN FROM THE NATURAL HISTORY MUSEUM OF LOS ANGELES COUNTY'S NATURE GARDENS

Loretta Lulu Deranja<sup>1</sup>, Eric Baghdasarians<sup>1</sup>, Lily Yoder<sup>1</sup>, Soraya Luna Sami<sup>1</sup>, Jann Vendetti<sup>2</sup>

<sup>1</sup> Department of Biological Sciences, Glendale Community College

<sup>2</sup> Malacology Department, Natural History Museum of Los Angeles County

Corresponding Author: Jann Vendetti, Malacology Department, Natural History Museum of Los Angeles County (jvendetti@nhm.org)

The Nature Gardens of the Natural History Museum of Los Angeles County include native and exotic drought tolerant plants within 3.5 acres (1.4 hectares) of land adjacent to the Museum, in the Exposition Park neighborhood of Los Angeles. Since 2022, student-interns participating in Glendale Community College's Biology 50 course (Internship at the Natural History Museum) sampled pollen from a selection of Nature Garden flowering plants and examined it under the Museum's Scanning Electron Microscope (SEM). Students learned to use the SEM, noted differences in pollen morphology, and learned about pollen adaptations for wind and insect dispersal. Here, we share some of these images as a poster that will be distributed to Glendale Community College biology faculty and Museum educators.

### 136. HORIZONTAL RATE OF MOVEMENT AND ALLOMETRIC SCALING IN JUVENILE WHITE SHARKS AT PADARO BEACH

Wyatt Weaver<sup>1</sup>, Chris Lowe<sup>1</sup>

<sup>1</sup> Department of Biological Sciences, California State University, Long Beach

Corresponding Author: Wyatt Weaver, Department of Biological Sciences, California State University, Long Beach (wyatt.weaver01@student.csulb.edu)

Juvenile white sharks (JWS, *Carcharodon carcharias*) aggregate seasonally in nearshore nursery habitats of the Southern California Bight. Two-dimensional horizontal displacement over ground between successive detections, or rate of movement (ROM), was identified for JWS within the nursery at Padaro Beach, California (2020-2023). Passive acoustic telemetry and a VPS array yielded 489,253 total detections from 81 individuals (mean = 6,035 detections per JWS). ROM was calculated in meters per second (m/s) and standardized to body length (BL/s) to evaluate ROM across three size classes: small (137-196 cm), medium (196-256 cm), and large (256-315 cm). Mean ROM across JWS was 0.304 BL/s (0.63 m/s), and the median for small JWS (n = 32) was 0.355 BL/s with an interquartile range (IQR; 25th-75th percentile) of 0.289-0.422 BL/s, whereas larger JWS (n = 16) had a median of 0.235 BL/s with an IQR of 0.195-0.278 BL/s. Crepuscular peaks near 07:00 and 18:00 PST mark consistent increases in horizontal displacement during the early morning and late afternoon hours. Coupled with the measured BL/s differences, these results demonstrate that JWS ROM reflects size class scaling observed at similar coastal aggregation sites and identifies that horizontal displacement within a nursery is influenced by body size and time of day.

### 137. PHYTOLENS: AI-POWERED PLANT DISEASE DETECTION USING LLMS AND SMART GLASSES

Jason Park<sup>1</sup>

<sup>1</sup> High School Student, Stratford Preparatory Blackford High

Corresponding Author: Jason Park, High School Student, Stratford Preparatory Blackford High (jphappy2898@gmail.com)

We propose a scalable AI framework leveraging Large Language Models for the early detection of plant diseases. By integrating these advanced models into voice-activated smart glasses, we provide a hands-free solution for real-time field diagnostics. Using Gemini 2.5 Flash to classify plant health, we conducted two experiments. First, we used zero-shot learning to optimize the prompting. Second, we extended this with a dynamic few-shot approach using RAG (Retrieval Augmented Generation). Instead of fine-tuning, we generated image descriptions and embeddings using Gemini and built a repository with them. For each test image, we retrieved the k most similar images from the repository using RAG and added them as few-shot examples. This helped the model to classify visually similar images with higher accuracy. We evaluated the model using the PlantWild dataset which contains 18,542 in-the-wild images of diverse plants, using their model as a baseline. Experimental results showed that our base model improved the F1 score by 6.5% over the baseline. The dynamic few-shot model improved F1 by 14.5%, demonstrating that providing few-shot examples helped Gemini distinguish between visually similar pathologies. We also built a smart glasses prototype to integrate the model for real-time detection. As a foundational vision detection model, our framework can easily adapt to unseen diseases without model retraining, offering a promising direction for the application of AI in agriculture.

### 138. COMPARING DROUGHT TOLERANCE OF ARUNDO, MULE FAT, AND WILLOW IN A GROUNDWATER DEPENDENT ECOSYSTEM

Milan Coleman<sup>1</sup>, Casey Wisely<sup>2</sup>, Alexandria Pivovarovff<sup>1</sup>

<sup>1</sup> Biology Department, Occidental College

<sup>2</sup> Marine Science Institute, UCSB

Corresponding Author: Alexandria Pivovarovff, Biology Department, Occidental College (pivovarovff@oxy.edu)

The Santa Clara River is a groundwater dependent ecosystem. The region experiences an annual seasonal-drought, but groundwater offers consistent water access to this biodiverse riparian community throughout the year. However, climate change and increasing human water demand may reduce groundwater availability, potentially putting this ecosystem at risk. We asked, Are woody native riparian species more vulnerable to drought than invasive species? To address this question, we quantified plant water use and drought tolerance traits of two native species, *Salix lasiolepis* (arroyo willow) and *Baccharis salicifolia* (mule fat), and the invasive *Arundo donax* (giant reed). We measured water potentials, water use efficiency, and wilting point. In addition, we quantified dehydration resistance with vulnerability curves using the optical method. We hypothesized that while native species are well adapted to their current conditions, invasive *Arundo* would exhibit greater drought tolerance and therefore be better suited for survival under future stressful conditions. Preliminary results indicate that *Arundo* maintains less negative water potentials and higher water use efficiency than the native species. However, there were no differences in wilting point, and vulnerability curves are being finalized. These findings suggest that *Arundo* may have a physiological advantage over native riparian species and could be better suited to persist under projected hotter and drier conditions.

### 139. RESTORATION TRAJECTORY OF INVERTEBRATES AND INSECTS FOLLOWING SEDIMENT AUGMENTATION

Elliott Brammer<sup>1</sup>, Christine Whitcraft<sup>1</sup>, Anita Arenas<sup>1</sup>

<sup>1</sup> Biological Sciences Department, California State University Long Beach

Corresponding Author: Elliott Brammer, Biological Sciences Department, California State University Long Beach (ejamesbrammer@gmail.com)

Coastal salt marshes are vital habitats, providing essential ecological and economic services. Despite this, much of

Southern California's wetlands have been lost entirely, and those that remain are threatened by rapid sea-level rise due to global warming. To address habitat loss, wetlands can be elevated with sediment augmentation, which in turn create novel habitats that ideally come to resemble the original marsh. In 2016, augmentation began at Seal Beach National Wildlife Refuge. Both the augmented and natural sites have been monitored to compare their ecological trajectories. Following sediment augmentation, invertebrate abundance immediately fell; ten years later, sediment cores and pitfall traps were used to compare invertebrate diversity between sites. Infaunal results show the control marsh maintains higher abundance, though species richness has increased at augmented sites to comparable levels. Pitfall trapping is ongoing, but current data indicate no significant differences in diversity between sites. Initially, infaunal community composition shifted toward terrestrial groups; however, at the ten-year mark communities have become more similar. This suggests the augmented site is beginning to resemble the natural marsh in composition, diversity, and epifaunal abundance. As climate change compels managers to modify existing habitats, these results are promising, demonstrating that sediment augmentation can support restoration, though recovery is gradual.

#### 140. SEROTONIN 2B RECEPTOR EXPRESSION IN EARLY EMBRYOGENESIS

Saumaun Zadeh<sup>1</sup>, Dr. Max Ezin<sup>1</sup>

<sup>1</sup> Biology Department, Loyola Marymount University

Corresponding Author: Saumaun Zadeh, Biology Department, Loyola Marymount University (szadeh@lion.lm.edu)

The serotonergic system via receptor 2B plays a crucial role in adult vertebrates, regulating sleep cycles in the central nervous system and smooth muscle tone in the cardiovascular system, with potential links to hypertension. In the vertebrate embryo, serotonin has been detected at developmental stages of blastulation, gastrulation, neurulation and early organogenesis. Yet, partly because the distribution of many serotonergic receptors remains unknown at these early stages, the function of serotonin in early vertebrate embryos is largely unclear. To begin to address these questions, we are determining the developmental spatiotemporal expression of serotonin receptor 2B, using the chick embryo as a model organism. Chick embryos were collected from Hamburger Hamilton stages 4 (gastrulation) to 12 (early neurulation). The embryos were fixed in 4% paraformaldehyde, and processed for indirect immunohistochemistry with an anti-5HT<sub>2B</sub> antibody. Whole mount imaging of stained embryos provided evidence that 2B receptor expression is found in the neural tube, neural crest, and somites. Interestingly the neural tube showed left-right asymmetrical expression. Future directions consist of completing staining, imaging, and sectioning our selected stages.

#### 141. PATHWAY-LEVEL EFFECTS OF CELL CULTURE DIMENSIONALITY ON iPSC-DERIVED DA NEURON TRANSCRIPTOMES

Justin Liu<sup>1</sup>

<sup>1</sup>Sage Hill School

Corresponding Author: Justin Liu, SCAS RTP, Sage Hill School (justinliu.jl28@gmail.com)

Among the various emerging avenues for treating Parkinson's disease (PD), a neurodegenerative disease characterized by the gradual loss of nigrostriatal dopaminergic (DA) neurons, cell transplantation with induced pluripotent stem cell (iPSC)-derived DA neurons have demonstrated remarkable promise in recent clinical and animal studies. Monolayers and organoids are two well-established models for culturing and differentiating DA neurons in vitro, yet they fundamentally differ in dimensionality, with the 3D structure of organoids contributing to a more in vivo-like environment compared to the 2D structure of monolayers. This study explores the pathway-level differences between monolayer and organoid models of iPSC-derived DA neurons using transcriptomic data from the Gene Expression Omnibus (GEO) and RNA-seq data analysis software from the bioinformatics platform Galaxy. By utilizing gene set enrichment analysis, components of the oxidative phosphorylation pathway were found to be upregulated in the organoid group, and downregulation was reported in nucleosome proteins, adherens junction elements, and TGF- $\beta$  signaling pathway mediators, indicating that the complex 3D environment of organoids may promote more efficient maturation of DA neurons over 2D monolayers. Future studies involving larger datasets and less confounding technical variation across groups are absolutely necessary to assess the transcriptomic profiles of each condition with greater

depth and reliability.

#### 142. EFFECT OF WATER TEMPERATURE ON GOLDEN ROCKWEED

Adelina Grotenhuis<sup>1</sup>, Fiona Herbold<sup>1</sup>, Adam Akins<sup>2</sup>, Nina J. Karnovsky<sup>1</sup>

<sup>1</sup> Dept. of Biology, Pomona College

<sup>2</sup> Dept. of Natural Sciences, Pitzer College

Corresponding Author: Nina J. Karnovsky, Dept. of Biology, Pomona College (nina.karnovsky@pomona.edu)

Rockweeds provide habitat for a high diversity of taxa, increase community stability and resiliency, and insulate against thermal stress and desiccation. Golden Rockweed (*Silvetia compressa*) is in decline across California, likely due to rising Sea Surface Temp (SST). A strong El Niño event occurred in 2023, causing a historic high SST, followed by a La Niña event in 2025, causing low SST. In our study, we investigated how temperature fluctuations during El Niño and La Niña events affect Golden Rockweed coverage. We hypothesized that Golden Rockweed is found at higher percent coverage in years with lower water temperature (La Niña). We predicted that, during the El Niño year (2023), there would be lower Golden Rockweed coverage. We surveyed the intertidal community at Shaw's Cove, Laguna Beach in January 2023 and 2026. Using Quadrat Sampling, we collected data on height above water, time, and species and compared with data from 2023. We found a higher percentage coverage and higher sightings overall of Golden Rockweed during the 2025 La Niña event. During the 2023 El Niño event, Golden Rockweed was only found in the high tide zone. The results support our hypothesis that Golden Rockweed is found at a higher percent coverage in years with lower water temperature, indicating that during El Niño years, there is less habitat availability for other species and less refuge against thermal stress.

#### 143. 10-YEAR ASSESSMENT OF CHANGES ON BEETLE ASSEMBLAGES AT THE ROBERT J. BERNARD FIELD STATION

Simon Leonard<sup>1</sup>, Mauro Gutierrez Muniz<sup>1</sup>, Alexis Rodriguez Zambrano<sup>2</sup>, Aria Pines<sup>1</sup>, Bra'sen Phillips-Bates<sup>1</sup>, Lily Waldman<sup>3</sup>, Ishan Paduvagere<sup>4</sup>

<sup>1</sup> Biology Department, Pomona College

<sup>2</sup> Department of Natural Sciences, Pitzer College

<sup>3</sup> Department of Natural Sciences, Scripps College

<sup>4</sup> Santa Susana High School, Wallace M. Meyer III, Department of Biology, Pomona College

Corresponding Author: Simon Leonard, Biology Department, Pomona College (sblm2025@mymail.pomona.edu)

In southern California, habitat fragmentation through (sub)urban development often creates small patches of natural landscapes. How isolation impacts beetle assemblages is understudied as historical baselines are rare. We investigated the effects of isolation by examining ground beetle assemblages collected over the last decade at the Bernard Field Station (BFS), an isolated patch of natural habitat (California sage scrub and non-native grasslands) in Claremont, California. To explore how beetle assemblages have changed over the past decade, we are examining patterns in beetle species richness and assemblage structure. Preliminary analyses comparing assemblages collected in Spring 2013 and Spring 2014, to those collected in Spring 2023 and 2024 suggest that beetle richness has decreased over time. Beetle species composition differed among each survey, with a high percentage of species (30 to 50%) being collected only during one collection period. While preliminary, our results suggest that extinction is outpacing colonization of beetle species at the BFS and that beetle diversity in these isolated habitat fragments is declining over decadal scales. Future research will include comparing changes in assemblage structure for many ground-dwelling arthropod faunal groups and incorporating findings from all seasons for both the initial (Spring 2013 to Spring 2014) and most recent collection periods (Spring 2023 to Spring 2024) and every spring from 2013 through 2024.

#### 144. PIGMENT CONTENT IN *L. PEREZII* LEAVES AT VARIOUS STAGES OF DEVELOPMENT

Hannah Kotek<sup>1</sup>

<sup>1</sup> Biology Department, Loyola Marymount University

Corresponding Author: Hannah Kotek, Biology Department, Loyola Marymount University  
(hannahkotec2022@gmail.com)

Many plant species exhibit color changes during leaf development, where young leaves present pink and gradually turn green as the leaf matures. *Limonium perezii* (Stapf) F.T. Hubb, a salt-secreting halophyte native to the Canary Islands exhibits this phenomenon. Digital imaging and RGB color analysis was performed and identified a correlation between R values (strong, positive) and B values (moderate, negative) and developmental markers including stomatal and salt gland densities, indicating a relationship between development and color. The pigments associated with the developmental color change were spectrophotometrically quantified. Following imaging and RGB analysis, pigments were extracted over 24 hours from *L. perezii* leaves at various developmental stages using ethanol (chlorophylls and carotenoids) or acidified methanol (anthocyanins). The pigment content of each leaf was quantified based on standard wavelengths and absorbances identified in previous studies. Measuring the differences in pigment contents of leaves provides insight into the temporal changes in pigment production, further elucidating the relationship between color and leaf development. Pigment content serves as another measurable developmental change *L. perezii*, which may be used in conjunction with RGB color values, stomatal, and salt gland densities to render a clearer developmental scheme for *L. perezii*, and perhaps other species

#### 145. SPATIAL AND TEMPORAL REGULATION OF PILA GENE EXPRESSION DURING RHIZOBIUM-LEGUME SYMBIOSIS

Isabella Pezo<sup>1</sup>, Dr. Nancy Fujishige<sup>1</sup>

<sup>1</sup> Biology Department, Loyola Marymount University

Corresponding Author: Isabella Pezo, Biology Department, Loyola Marymount University (ipezo@lion.lmu.edu)

*α-Rhizobium* are nitrogen-fixing soil bacteria that form symbiotic relationships with legume plants. In exchange for supplying biologically usable nitrogen, the bacteria are housed within root nodules and fed carbohydrates. This project explores the timing and regulation of *pilA1* and *pilA2* gene activation during root nodule infection. These genes encode for pilus formation, required for bacterial motility and host attachment. Although previous findings show deletion of *pilA1* genes disrupts the infection process, the regulatory signals controlling their expression remain unclear. This study aims to determine when, where, and under what conditions *pilA1* genes are expressed. A *lacZ* promoter-reporter fusion was used to track *pilA1* expression via blue staining. The reporter was introduced into four *Sinorhizobium meliloti* strains (wild-type and infection-deficient mutants) to perform culture filtrate assays testing quorum-sensing involvement, plant signal exposure assays using root exudates and extracts, and biofilm assays assessing surface-attachment activation. Additionally, *Melilotus alba* plants were inoculated to evaluate *pilA1* expression *in planta*. Nodules were analyzed and gene expression levels quantified across assays to compare *pilA1* and *pilA2* activation under varying conditions, providing insight into their regulation and functional role in root nodule infection.

#### 146. DOCUMENTING MARINE BIODIVERSITY ALONG THE PACIFIC COAST

Fatima Villalbazo<sup>1</sup>, Joseph Heras<sup>1</sup>

<sup>1</sup>Biology Department, California State University San Bernardino

Corresponding Author: Fatima Villalbazo, California State University San Bernardino (008015794@coyote.csusb.edu)

Environmental DNA (eDNA) provides a non-invasive approach to studying biodiversity by detecting genetic material shed by organisms into their environment (e.g., soil, snow, water). This project focuses on marine biodiversity through the analysis of tissue samples from 11 species collected along the Pacific Coast, with an emphasis on two fish families: *Pholidae* and *Stichaeidae*. Samples were obtained from Friday Harbor Laboratories in Washington. DNA was extracted from muscle tissue, quantified, and amplified using primers targeting a fragment of the 12S rRNA gene. Gel

electrophoresis was used to confirm successful amplification, and the samples were subsequently sequenced using the Sanger method. The resulting sequences will be deposited in public databases to support future research in marine conservation and species identification. By analyzing 12S gene fragment sequences, we aim to identify fixed mutations across taxa. Future work will expand to eDNA samples from intertidal and subtidal habitats to evaluate whether our markers reliably match the species examined here. This approach provides a foundation for documenting fish biodiversity using eDNA-based methods.

#### 147. CONSERVING ORPHANED PALEONTOLOGICAL RESOURCES

Luigi Miguel Quintana<sup>1</sup>, Paige Smith<sup>2</sup>, Corinna Bechko<sup>3</sup>, Juliet Hook<sup>3</sup>, Austin Hendy<sup>3</sup>

<sup>1</sup> Biology Department, California State University, Dominguez Hills

<sup>2</sup> California State University, Dominguez Hills

<sup>3</sup> Natural History Museum of Los Angeles County

Corresponding Author: Luigi Miguel Quintana, Biology Department, California State University, Dominguez Hills (lquintana6@toromail.csudh.edu)

Construction and permit-required activities in California often require mitigation measures (collection and curation) to preserve paleontological resources. In some instances, the funding required for their long-term preservation is not available, resulting in resources languishing in storage. The California Institute for Biodiversity provided funding to the Natural History Museum of Los Angeles County to physically curate and digitize paleontological specimens at risk of loss. The purpose of the CIB project was to curate and digitize 26,000 invertebrate fossils from more than 160 sites across Southern California. These fossils were collected from a range of Miocene through Pleistocene-age localities in the greater Los Angeles area. The specimens were collected from the Puente, Castaic, and Fernando formations. These have been historically poorly documented and inaccessible to researchers. The potential for knowledge gain through physical and digital curation of these collections is significant. Interns from California State University, Dominguez Hills helped curate the collection, gained hands-on experience in paleontology and geology. The majority of the material comprised bivalves, gastropods, small vertebrate remains, and leaves. It ranged from pristine shells, bones, and teeth, to poorly preserved (moldic) fossils. These collections help fill knowledge gaps and are irreplaceable due to site destruction. These additions will be known for the research community.

#### 148. PHYSIOLOGICAL RESPONSE OF SILVETIA COMPRESSA TO WARMING

Hailey Pistochni<sup>1</sup>, Kate Selfe<sup>1</sup>, Robin J. Fales<sup>1</sup>

<sup>1</sup> Soka University of America

Corresponding Author: Robin J. Fales, Concentration in Environmental Studies, Soka University of America (rfales@soka.edu)

*Silvetia compressa* is a rockweed found in the mid intertidal zone from British Columbia to Baja California. In recent years, populations of *S. compressa* have declined. As an ectotherm, the physiology of *S. compressa* is influenced by environmental temperature. This study aims to understand how *S. compressa* will respond to warming ocean temperatures due to climate change using a thermal performance curve (TPC) framework. *S. compressa* was collected at Little Corona del Mar, Newport Beach, CA. Dissolved oxygen produced by *S. compressa* was measured inside a closed chamber to determine photosynthetic performance at a range of temperatures (9, 17, 25, 33°C). Closed chambers were placed in individual water baths set to a specific temperature. Dark respiration was measured after a 5-minute dark acclimation period and again after one hour. Lights were set to saturating irradiance (529 PAR) for a 5-minute acclimation period, with measurements taken before and after a 20-minute period. Data was fitted using an O'neill TPC curve. While our study needs more temperatures to build a full curve, initial results indicate that the thermal optimum (Topt) is between 25-31°C. Current normal habitat temperature is 16°C indicating that *S. compressa* has a thermal safety margin of 10-15°C. This large thermal safety margin suggests that increasing ocean temperatures may not be the reason for the decline of *S. compressa*.

## 149. DIGITIZATION OF FRESHWATER FISHES IN CALIFORNIA

Tina Wu<sup>1</sup>, Todd R. Clardy<sup>2</sup>, William B. Ludt<sup>2</sup>

<sup>1</sup> Research and Collections Department, Natural History Museum of Los Angeles County

<sup>2</sup> Ichthyology Department, Natural History Museum of Los Angeles County

Corresponding Author: Tina Wu, Research and Collections Department, Natural History Museum of Los Angeles County (twu@nhm.org)

Natural history museum collections are crucial archives of past and present biodiversity, and thus serve as an essential resource for scientific research and education. However, access to these collections can be limited to many if they don't live near them or have the financial means to visit them. Digitization of these collections is therefore necessary for increased access and effective use by researchers, educators, and the wider public. There are over 80 native fish species in California's freshwater ecosystems. Unfortunately, many of these species are negatively impacted by changes in water use patterns, climate change, and introduced species. As such, documenting and studying the native freshwater biodiversity in the state is important but can be difficult due to a lack of comparative material or funding. Using a Bruker SkyScan 1273  $\mu$ CT scanner, we digitized the skeletal anatomy of the NHMLA's freshwater California fishes. The digitization of these fishes documents the diversity of fishes in the freshwater ecosystems of California and creates an accessible resource of high-resolution anatomical data for use in the scientific and wider community. The skeletal anatomy documented will be a valuable resource for research into topics such as evolutionary patterns and as a starting point for the creation of educational models that can be utilized in a variety of settings ranging from museum outreach programs to high school, college, and graduate-level classrooms.

## 150. EVALUATING THE ROLE OF CYANOPHAGES IN SHAPING THE PICOCYANOBACTERIA ECOLOGY OF OCEANS

Sean Boyd<sup>1</sup>, Michael Carlson<sup>1</sup>

<sup>1</sup> Department of Biological Sciences, California State University, Long Beach

Corresponding Author: Sean Boyd, Department of Biological Sciences, California State University Long Beach (sean.boyd01@student.csulb.edu)

Picocyanobacteria are the most abundant photosynthetic organisms in the oceans. Marine viruses infect and lyse these cells, reshaping the fate of their fixed carbon in the oceans. The global magnitude of viral regulation of picocyanobacterial populations remains unconstrained because few methods accurately measure infection, and existing observations have limited spatial coverage. Here, we developed a new approach to estimate infection levels from metagenomic datasets. By comparing genomic signatures of cyanophage infection to a novel quantitative molecular approach that measures infection in samples collected across three 2000 km transects in the North Pacific Ocean, we established an empirical relationship to infer viral infection levels in 3,461 metagenomes collected across all ocean basins from 2003-2025. The global median infection level was 0.72% corresponding to an estimated  $3 \times 10^{25}$  virally infected cells. Subtropical gyres, where picocyanobacteria are numerically dominant, often exhibited low levels of infection (0.32% on average), whereas transition regions between major oceans had seven-fold higher infection observed up to 21.1%. We also observed seasonal patterns in infection with enhanced infection in summer. Collectively, these observations indicate that viral infection is a dynamic force shaping picocyanobacterial distributions and is likely to shift as nutrient regimes and ocean biomes respond to climate change.

## 151. ZOOSPORIC PARASITES EMERGE DURING DIATOM BLOOMS IN THE SOUTHERN CALIFORNIA BIGHT ECOSYSTEM

Marley Yagle<sup>1</sup>, Michael Carlson<sup>1</sup>

<sup>1</sup> Biological Sciences Department, California State University Long Beach

Corresponding Author: Marley Yagle, Biological Sciences Department, California State University Long Beach (Marley.Yagle@student.csulb.edu)

The mechanisms governing phytoplankton mortality strongly influence organic matter transfer, nutrient cycling, and ocean productivity. However, the role of eukaryotic parasites in phytoplankton mortality remains uncharacterized. Over 10 months, we quantified the abundance and diversity of parasites infecting diatoms, abundant and diverse marine phytoplankton, in Alamitos Bay, Long Beach, CA, in the Southern California Bight. We measured diatom-parasite dynamics and environmental conditions. Water temperatures ranged from 11.2-22.5 °C and phytoplankton biomass peaked four times, showing pronounced seasonal shifts. Diatom abundances (3 to 1,011 cells mL<sup>-1</sup>) revealed three bloom events with 1.4–6-fold increases between weeks. Community structure shifted during blooms (Simpson's D= 0.42–0.81), including a March 2025 bloom dominated (73.3%) by the toxigenic diatom *Pseudo-nitzschia*. Infected diatoms were detected in 17% of samples. Infection increased 3.2-fold following the October bloom, lagging the host maximum. During the March bloom, infection rose from undetectable to 1.03 cells mL<sup>-1</sup> following a 3.7-fold increase in hosts. These data suggest density-dependent host-parasite interactions contribute to bloom decline. We are expanding a new single-cell approach, the polony method, to improve detection of cryptic infections. Integrating molecular and microscopy-based methods will enable comprehensive assessment of infection prevalence and ecological role in phytoplankton dynamics.

## 152. SUSPECTED MICROPLASTIC OCCURRENCE IN ISLAND FOX SCAT ON SANTA CRUZ ISLAND, CA

Diana Rodriguez<sup>1</sup>, Kalani Wagoner<sup>1</sup>

<sup>1</sup> Environmental Science and Resource Management, CSU Channel Islands

Corresponding Author: Diana Rodriguez, Environmental Science and Resource Management, CSU Channel Islands (diana.rodriguez513@myci.csuci.edu)

Microplastic pollution is a growing ecological concern with potential challenges for terrestrial mammals, yet studies on remote island ecosystems remain limited. This study investigates microplastic presence in Island Fox (*Urocyon littoralis santacruzae*) scat collected across multiple locations on Santa Cruz Island, California, to analyze variation and potential exposure pathways. Scat samples (n=55) were processed using potassium hydroxide (KOH) digestions to isolate biological and anthropogenic matter. Suspected microplastics were analyzed using microscopy and categorized by morphology, a subset of particles were processed under Fourier Transform Infrared Spectroscopy (FTIR), and spectral matches were compared with OpenSpecy libraries to further assess particle identification agreement. Descriptive statistics and non-parametric analyses were used to evaluate differences. Preliminary results indicate detectable suspected microplastics across all study locations, with variation in abundance potentially related to human activity and marine debris deposits. Fibers were the dominant morphology observed. This research provides a baseline for microplastic exposure in an endemic island omnivore and highlights the importance of adding terrestrial wildlife to microplastic monitoring. Findings contribute to conservation discussions for the Island Fox and deeper understanding of the anthropogenic contamination in island ecosystems.

## 153. FIXING THE FORMALIN PROBLEM: LOW-COST DNA EXTRACTION FROM FORMALIN PRESERVED INVERTEBRATES

Ryan Moinazad<sup>1</sup>, Regina Wetzer<sup>1</sup>

<sup>1</sup> Marine Biodiversity Center, Natural History Museum of LA County

Corresponding Author: Ryan Moinazad, Marine Biodiversity Center, Natural History Museum of LA County (moinazad@usc.edu)

Formalin preservation is an invaluable tool for preserving morphology in marine invertebrate specimens across museum collections. These specimens have long been deemed unusable for molecular analysis due to the various damages that formalin induces in DNA. Current DNA extraction protocols for formalin preserved specimens rely widely on commercial kits and/or hazardous methods, such as phenol-chloroform or highly alkaline reagents. To counter these

challenges, we developed a low-cost DNA extraction workflow without using commercial kits. A slightly alkaline, SDS-based lysis buffer was used in overnight digestion of formalin-preserved samples (>10 years) that had later been moved to ethanol, followed by extraction with in-house buffers. One sample lot (n=20 extractions) from each of the following crustacean species was used: *Caprella mutica*, *Phronima sedentaria*, and *Porcelio scaber americanus*. Internal tissue from the lower extremity of a *Bathynomus giganteus* individual was also used (n=10 extractions). DNA was recovered from all samples and all species amplified for the 16S marker. Successful reactions were sequenced using Nanopore, and sequences from 3 of the 4 species (with the exception of *P. sedentaria*) aligned with their taxonomically identification using BLAST. This workflow produced a low-cost, accessible approach to generating genetic support for taxonomic identification, making predominantly older and formalin preserved natural history collections available for study.

#### 154. GENOMIC VARIATION IN COWCOD (SEBASTES LEVIS)

Chloe Saldaña<sup>1</sup>, Matthew Wahba<sup>2</sup>, John Carlos Garza<sup>3</sup>, Elizabeth Gilbert-Horvath<sup>3</sup>, Andres Aguilar<sup>2</sup>

<sup>1</sup> Biological Sciences Department, California State University Los Angeles, Natural History Museum of Los Angeles County

<sup>2</sup> Biological Sciences Department, California State University Los Angeles

<sup>3</sup> Southwest Fisheries Science Center, National Oceanic and Atmospheric Administration

Corresponding Author: Chloe Saldaña, Biological Sciences Department, California State University Los Angeles, Natural History Museum of Los Angeles County (csaldana@nhm.org)

Cowcod is a long-lived species of rockfish known for its distinctive coloration and large size, making them a popular target for recreational and commercial fisheries, leading to severe overfishing. As a result, cowcod populations declined dramatically, reducing their unfished biomass to an estimated 7% of historical stocks. This has prompted the establishment of Cowcod Conservation Areas to allow the species to recover. Previous studies suggested the existence of three distinct genetic lineages, one north and two south of Point Conception, California. This project will use a genome assembly coupled with low coverage whole genome sequencing to assess variation and population structure across the species' geographic range through genome-wide diversity ( $\theta$ ) admixture analysis, principal component analysis (PCA), and pairwise population differentiation (FST). Preliminary analysis produced a contiguous genome with elevated BUSCO scores for cowcod. Additionally, genome-wide SNPs revealed two lineages with a genome-wide FST of 0.13, a value similar to what is found in other distinct species. Genome-wide diversity ( $\theta$ ) was lower in cowcod compared to other species, which could be due to recent overfishing or historical events. This preliminary work will be expanded with additional data to determine the geographical extent of the different lineages and if there is mixture amongst the groups, potentially contributing to the development of future fisheries management.

#### 155. PRE-CLASS AI PODCASTS IMPROVE ECOLOGY LEARNING

Laura Díaz<sup>1</sup>, Víctor D. Carmona-Galindo<sup>2</sup>

<sup>1</sup> Organizational Leadership Program, University of La Verne

<sup>2</sup> Biology Department, University of La Verne

Corresponding Author: Laura Díaz, Organizational Leadership Program, University of La Verne (laura.diaz5@laverne.edu)

In the aftermath of the COVID-19 pandemic, instructors in higher education have reported a decline in foundational reading habits, particularly in STEM courses where dense, technical texts are common. This study examines a low-barrier instructional intervention that used generative AI (GenAI) to support pre-class preparation in two upper-division biology courses. Weekly AI-generated audio overviews—"podcasts"—were paired with timed, textbook-based online quizzes. These tools were not intended to replace reading, but to scaffold engagement, reduce preparation anxiety, and promote early familiarity with course content. We analyzed student engagement, perceptions, and performance using pre/post surveys, quiz scores, and exam outcomes. Students reported that the podcasts helped manage time constraints, improved their readiness for lecture, and increased their motivation to read. Those who

consistently completed the quizzes performed significantly better on closed-book, in-class exams and earned higher final course grades. Our findings suggest that GenAI tools, when integrated intentionally, can reintroduce structured learning behaviors in post-pandemic classrooms. By meeting students where they are—without compromising cognitive rigor—audio-based scaffolds may offer inclusive, scalable strategies for improving academic performance and reengaging students with scientific content in an increasingly attention-fragmented educational landscape.

#### 156. INTERTIDAL SPECTRAL VARIABILITY FROM SPACE

Kyla Monique Cabrera<sup>1</sup>, Kelly Luis<sup>2</sup>, Gabriela Shirkey<sup>1</sup>, Richelle Tanner<sup>1</sup>

<sup>1</sup> Schmid College of Science and Technology, Chapman University

<sup>2</sup> Jet Propulsion Laboratory, California Institute of Technology

Corresponding Author: Kyla Monique Cabrera, Schmid College of Science and Technology, Chapman University (kycabrera@chapman.edu)

Coastal intertidal zones are biologically diverse and ecologically sensitive habitats. This biodiversity is characterized by a wide variety of substrate types, including rocks, sand, seaweeds, invertebrates, and more. Field spectroscopic surveys provide fine-scale observations of substrate types but these measurements can be laborious and costly to retrieve. Ultimately, this highlights the need for fine spectral resolution remote sensing to monitor large-scale biodiversity trends. This study investigated (1) the spectral diversity of in situ versus EMIT observations and (2) how observed in situ and EMIT spectra reflect biodiversity. Field data were collected in May 2025 in Southern California sites and hyperspectral data came from NASA's EMIT instrument on the International Space Station. Preserved heterogeneity within a pixel allowed spectral signatures to incorporate contributions from several points, producing patterns that better reflected on-ground taxonomic diversity. This demonstrates the instrument's ability to capture spectral variability across heterogeneous habitats. The workflow is reproducible and cost-effective. These findings have implications for coastal management: spectral variability can detect shifts in algal cover, bare rock exposure, or invasive species, and track recovery after disturbance. This approach provides a scalable framework for seasonal monitoring, complementing fieldwork and enabling researchers to assess ecologic change where access is limited.

#### 157. APIS WING ECOMORPHOLOGY UNDER URBAN CHANGE

Taylor Puno, Arlyn Mora, Sophia Santana, Emma Alvarez, Isabella Alvarez, Arleen Anguiano, Jocelyn Martinez

Corresponding Author: Víctor D. Carmona-Galindo, Biology Department, University of La Verne (vcarmona@laverne.edu)

Natural history collections provide opportunities for spatiotemporal examination of population-level responses to environmental change. In eastern Los Angeles County, mid-20th-century urbanization transformed landscapes historically dominated by citrus agriculture into suburban environments, altering habitat structure and airflow conditions relevant to insect flight. Using *Apis mellifera* specimens curated in the student-generated Cultural and Natural History Collections at the University of La Verne, collected between 1960–1990, we examine ecomorphological responses to this localized land-use transition. Analyses of wing morphology demonstrate stabilizing selection across this period of environmental change, indicating constrained variation in overall wing form during rapid landscape modification. We further apply landmark-based geometric morphometrics to quantify variation in wing venation across the same historical time series. Preliminary analyses suggest that while overall wing morphology exhibits stabilizing dynamics, wing venation captures additional axes of variation linked to functional constraints on flight performance. This work highlights the value of legacy, student-curated collections for investigating ecomorphological responses to urbanization in an ecologically and economically important pollinator.

#### 158. FACILITATION BETWEEN *O. LURIDA* AND INVASIVE MUSSEL

Leeza-Marie Rodriguez<sup>1</sup>, Sarah Gilman, Danielle Zacherl

<sup>1</sup> Department of Biological Science, California State University, Fullerton

Corresponding Author: Leeza-Marie Rodriguez, Department of Biological Science, California State University, Fullerton (lmarierodriguez@csu.fullerton.edu)

Species interactions influence how organisms react to climate change stressors. The Stress Gradient Hypothesis suggests abiotic stress may shift interactions from negative to positive via habitat modification. As foundation species, native Olympia oysters (*Ostrea lurida*) and non-native Mediterranean mussels, (*Mytilus galloprovincialis*) provide vital ecosystem functions, including habitat creation and water filtration. They coexist at similar tidal elevations in Southern California estuaries, yet their interaction remains unexplored. Environmental stress is expected to shift their interaction from competitive to facilitative. Juvenile *O. lurida* and *M. galloprovincialis* were glued to concrete tiles (n = 5 replicates per treatment) at +0.3 mean lower low water tidal elevation, using varying densities and benign versus stressful solar exposures for one year at the Chula Vista Wildlife Reserve, San Diego, CA. Deployed temperature loggers will monitor the thermal environment. Three-way ANOVA's will assess the effects of solar aspect and bivalve density on oyster mortality, growth, and condition index after one year. If facilitation occurs under stressful solar exposure, *O. lurida*'s growth, mortality, and condition indices will improve in the mussel's presence relative to absence. Investigating these positive species interactions will inform their integration into restoration practice, enhancing restoration outcomes and reef ecosystem services.

#### 159. SPLASHPOOL DIETS INFLUENCE CONSUMER HEAT TOLERANCE

Ana Rowley<sup>1</sup>, Wes Dowd<sup>2</sup>, Murad Jah<sup>2</sup>

<sup>1</sup> Scripps College

<sup>2</sup> School of Biological Sciences, Washington State University

Corresponding Author: Ana Rowley, Scripps College (anarowley3@gmail.com)

Climate change is driving widespread changes in aquatic ecosystems, especially between producer and consumer species. Existing research on the impacts of climate change on organisms often overlooks interspecific interactions that shape community responses to environmental stressors by focusing on individual species in isolation. In marine systems, microalgae are a key nutritional source for many invertebrates. Recent studies suggest that the thermal history of these primary producers can influence consumer physiology beyond calories, even altering polyunsaturated fatty acid (PUFA) content. PUFAs play a critical role in cell function and thermal stress responses, such as homeoviscous adaptation, a key process involved in thermal adaptation and maintaining homeostasis in ectotherms. During chronic exposure to warmer temperatures, PUFA content decreases to increase membrane rigidity/maintain membrane structure. Dietary intake of lipids from thermally stressed algae may influence this process in consumers, thereby affecting consumer thermal tolerance. Through feeding adult male *Tigriopus californicus* green algae (*Nannochloropsis spp.*) cultures grown at 17 °C or 27 °C and comparing their heat tolerance (LT50 assays) based on feed treatment, this research examines whether primary producers' thermal history influences consumers' thermal tolerance. Contrary to our hypothesis, copepods that consumed warm-grown algae had a significantly lower thermal tolerance than copepod

#### 160. MARINE PRIMARY PRODUCTION IN THE SAN PEDRO CHANNEL

Steven Wei<sup>1</sup>, Diane Kim<sup>1</sup>

<sup>1</sup> Wrigley Institute for Environment and Sustainability & Environmental Studies Department, University of Southern California

Corresponding Author: Steven Wei, Wrigley Institute for Environment and Sustainability & Environmental Studies Department, University of Southern California (weisteve@usc.edu)

The USC Wrigley Institute San Pedro Ocean Time Series (SPOT) provides a long-term record of biogeochemical and physical variability in the San Pedro Channel, where spatiotemporal variations in marine primary productivity (MPP) are influenced by factors including climate variability, coastal upwelling, and water column stratification. This study investigates how climate indices and upwelling metrics explain variability in integrated chlorophyll concentration

(CHL) and deep chlorophyll maximum (DCM) position. Monthly CHL and DCM data were analyzed alongside water temperature, the Multivariate ENSO Index (MEI), the Pacific Decadal Oscillation (PDO), the Coastal Upwelling Transport Index (CUTI), and the Biologically Effective Upwelling Transport Index (BEUTI). Subsurface nitrate concentration was calculated by dividing BEUTI by CUTI. These environmental factors explain ~15–20% of CHL variability, with CUTI being the only standalone statistically significant predictor. For DCM depth, these variables explain ~19–23% of variability: warmer temperatures are associated with deeper DCMs, stronger upwelling shoals the DCM, and positive MEI phases correspond to deeper DCMs. PDO and subsurface nitrate concentration show no significant effects. These findings indicate that climate variability and upwelling significantly influence both vertical phytoplankton structure and integrated biomass magnitude in the San Pedro Channel. Future work will incorporate biological drivers of CHL and DCM.

#### 161. COMPLEMENTARITY IN PITCHER PLANT ROTIFERS

Breana Morales<sup>1</sup>, Vincent Cannizzaro, Alex A. Mendelson, Casey P. terHorst

<sup>1</sup>Department of Biology, California State University, Northridge

Corresponding Author: Breana Morales, Department of Biology, California State University, Northridge (breanammorales@gmail.com)

Higher genetic diversity within a population likely leads to more efficient resource use and the outperformance of interspecific competitors. This complementarity effect has been observed in plants and bacteria, but rarely in an animal. We aim to observe complementarity in populations of a rotifer (*Habrotrocha rosa*) endemic to the diverse leaf-water community of the purple pitcher plant *Sarracenia purpurea*. Rotifer culture diversity can be manipulated in the lab because *H. rosa* reproduce clonally. To compare competitive ability between diversity treatments, we will grow rotifers with and without a natural competitor (the ciliate *Tetrahymena*), then estimate the intrinsic growth rate of each replicate by fitting a logistic growth model to a population growth curve. Here, we will present the results of such an experiment. We expect that high diversity cultures will have a greater competitive ability, consistent with a complementarity effect of diversity.

#### 162. DO SOUTHERN CALIFORNIA MUSSELS HAVE MICROPLASTICS?

Kelsey Djan<sup>1</sup>, Chloe Goodsell<sup>1</sup>, Cascade Sorte<sup>1</sup>

<sup>1</sup> Ecology and Evolutionary Biology Department, University of California, Irvine

Corresponding Author: Kelsey Djan, Ecology and Evolutionary Biology Department, University of California, Irvine (Djank@uci.edu)

Microplastics are present in terrestrial and marine ecosystems due to human activities and storm runoff. Rural and urban watersheds are present along the California coast, and their runoff may accumulate in coastal species. Microplastics are mistaken for food and contain chemicals that can be harmful to organisms, causing a negative impact on coastal zones. Coastal mussels play a critical role in marine ecosystems by providing food and habitat to organisms at higher trophic levels. They are present in intertidal zones along the California Coast, including rocky intertidal habitats and piers. In this study, I investigated the concentrations of microplastics in California mussels along the Southern California coast. I hypothesize that microplastics are present in California Mussels and that more urban watersheds will have more microplastics present than rural watersheds near the pier. To perform this study, I collected mussels from Oceanside Pier and San Clemente Pier and digested the tissue using 10% potassium hydroxide. Once digested, the number of microplastics was counted using a microscope. To date, no microplastics have been identified in the pier samples from these less urban sites; however, sample processing is ongoing. Further microplastic analysis could be done in a future study with mussels collected from different locations along the coast of California that span a gradient from rural to urban to compare the microplastic counts with different types of watersheds.

#### 163. ANTIMICROBIAL RESISTANCE IN DOMESTIC POULTRY

Kiana Kelley-Fann<sup>1</sup>, Subhekshya Nepal<sup>1</sup>, Dr. Adriane Jones<sup>1</sup>

<sup>1</sup> Biological Sciences Department, Mount Saint Mary's University LA

Corresponding Author: Kiana Kelley-Fann, Biological Sciences Department, Mount Saint Mary's University LA  
(kiankell@msmu.edu)

Antimicrobial resistance (AMR) in commercial flocks is well documented, but there is less focus on AMR in domestic poultry flocks. Due to large-scale commercial antibiotic use, we expect to find lower levels of AMR on private poultry farms. AMR *E. coli*/i are challenging to treat and pose serious health risks to poultry flocks, humans, and wildlife by spreading through soil and water. Comparing AMR in *E. coli*/i across small-scale poultry coops with literature data from commercial poultry farms enables characterization of community AMR burden from a One Health perspective. We collected fecal samples from 6 domestic poultry farms in southern California and isolated *E. coli*/i on MacConkey agar, yielding 163 isolates. AMR prevalence was determined by disk diffusion on Mueller-Hinton plates with the following antibiotics: Tetracycline, Gentamicin, Ampicillin, and Erythromycin. Additionally, 79 isolates were also tested for susceptibility against Amoxicillin Clavulanate. Our analysis indicates that 44.2% of *E. coli*/i isolates were susceptible to all tested antibiotics, with the highest susceptibility to Gentamicin (100%). Multidrug resistance was seen in only 14.1% of isolates. Resistance was most frequently observed to Erythromycin (38.2%) and Tetracycline (19.6%), which were lower than documented in commercial poultry farms. By establishing AMR prevalence in domestic poultry, this study contributes to a broader understanding of AMR transmission at the community level.

#### 164. PHOTOSYNTHETIC STRATEGIES OF INVASIVE PLANTS

Marijo Peña<sup>1</sup>, Kira Annis<sup>1</sup>, Sabrina Gonzales<sup>1</sup>, Eraci Hamed<sup>1</sup>, Taylor Puno<sup>1</sup>, Víctor D. Carmona-Galindo<sup>1</sup>

<sup>1</sup> Biology Department, University of La Verne

Corresponding Author: Víctor D. Carmona-Galindo, Biology Department, University of La Verne  
(vcarmona@laverne.edu)

Herbarium collections provide a powerful archive for examining long-term ecological change, particularly in regions with strong environmental heterogeneity. Los Angeles County spans a diverse array of habitats, including coastal Mediterranean systems, desert environments, riparian corridors, and montane chaparral–pine assemblages, making it an ideal landscape for examining invasion dynamics across contrasting ecological contexts. In this study, we use herbarium metadata associated with invasive plant specimens to track the accumulation of species representing different photosynthetic pathways (C3, C4, and CAM) across Los Angeles County over the 20th century, providing more than 100 years of temporal coverage. We document differential accumulation patterns among invasive species, with C3 taxa increasing at a faster rate than C4 and CAM species. We hypothesized that rising atmospheric CO<sub>2</sub> concentrations may contribute to this divergence, given the greater sensitivity of C3 photosynthesis to atmospheric CO<sub>2</sub> relative to pathways with internal CO<sub>2</sub>-concentrating mechanisms. We present preliminary analyses of stomatal characteristics derived from rehydrated herbarium specimens using classical stomatal peel techniques and characterize pathway-specific stomatal patterning across C3, C4, and CAM species. Our findings highlight the value of herbarium collections for linking plant physiological strategies to invasion dynamics under global change.

#### 165. ACTIVITY PATTERNS OF WESTERN FENCE LIZARDS (*SCeloporus occidentalis*) IN NATURAL AND URBAN SITES

Deanni Armstrong<sup>1</sup>, Breanna J. Putman<sup>2</sup>

<sup>1</sup> Student, California State University, San Bernardino

<sup>2</sup> Biological Sciences Department, California State University, Long Beach

Corresponding Author: Deanni Armstrong, Alumni, California State University, San Bernardino  
(deannia.2020@gmail.com)

Urbanization, which is a process where rural areas become more urban, can negatively impact the wildlife that are present by altering the temperature and the humidity. Ectotherms, such as western fence lizards (*Sceloporus occidentalis*) are sensitive to changes in microclimates, and may alter their behavior to withstand these changes. As a part of the ‘Cool Lizards in the City’ project, which investigated differences in microclimates and how they affect *S. occidentalis* cutaneous water loss (CEWL) and blood osmolality across 11 Southern California college campuses, this study investigates how *S. occidentalis* activity differs between urban and natural sites at California State University, San Bernardino (CSUSB). We hypothesized that lizards from urban sites will exhibit different activity patterns than lizards from natural sites due to changes in temperature and water availability. For the study, we walked along transects at CSUSB’s urban and natural sites from 7:00 hrs to 18:00 hrs 6 times from March 2025 to May 2025. We recorded the number of visible lizards, the ambient temperature, and the lizard’s sun exposure (Full Sun/Partial Shade/Full Shade). With our data, we found no difference in daily lizard activity between urban and natural sites. Both sites had a bimodal activity with the peaks being in the early morning and late afternoon. We did find that *S. occidentalis* used different types of sun exposure depending on the temperature in both sites.

## 166. A LEARNING-BASED APPROACH TO WILDFIRE DETECTION AND MAPPING

Ayushi Agarwal<sup>1</sup> and Lea Harris<sup>2</sup>

<sup>1</sup>Oak Park High School, 899 Kanan Rd, Oak Park, CA 91377

<sup>2</sup> Jet Propulsion Laboratory, 4800 Oak Grove Drive, Pasadena, CA 91109

Corresponding Author: Ayushi Agarwal, Oak Park High School (techyayu2009@gmail.com)

Wildfires have significant impacts on the environment, property, and human life, making early detection critical. This study proposes a deep learning-based approach for wildfire detection and mapping using satellite imagery. A U-Net model was trained on historical wildfire images and segmentation masks to identify fire regions at the pixel level. The model was evaluated under varying dataset sizes, training durations, and batch sizes using metrics such as Dice Coefficient, Intersection over Union, Precision, and Recall. Results show that the model can accurately detect fire regions, highlighting the potential of deep learning for wildfire monitoring.