

Annual Report Fiscal Year 2021-2022



Transforming environmental science. Accelerating discovery. Generating solutions.



National Center for Ecological Analysis and Synthesis Director: Ben Halpern Annual Report Fiscal Year 2021-2022 University of California, Santa Barbara nceas@nceas.ucsb.edu

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MISSION STATEMENT

NCEAS's mission is to accelerate scientific discoveries that will enhance our understanding of the world and benefit people and nature, as well as to transform the scientific culture to be more open, efficient, and collaborative.

OVERVIEW

The National Center for Ecological Analysis and Synthesis (NCEAS) is an independent research center of UC Santa Barbara with a global network and impact. We conduct transformational science focused on informing solutions that will allow people and nature to thrive. Established in 1995, NCEAS has pioneered the movement toward scientific collaboration, openness, and synthesis in ecology and environmental science and has helped build a community of scientists around it.

We achieve **our mission**, stated above, through the following:

- Enabling collaborations between the brightest minds in the environmental sciences
- Conducting breakthrough science that is grounded in big-picture thinking
- Improving analyses through computing innovations that increase the usability of data
- **Partnering** with agencies and organizations that can help put the science to action
- **Training and inspiring** generations of scientists to practice synthesis and open science

Our approach to science is solutions oriented and enables discoveries at bigger scales and faster speeds, making them well positioned to inform environmental policy and management. The approach focuses on synthesis, leverages collaboration, and embraces and practices open science.

Environmental challenges are complex and their solutions require diverse perspectives and sets of expertise. In recognition of this, we convene multidisciplinary teams of academic and non-academic researchers from all over the world into working groups who, over the course of one to two years, tackle "wicked" questions collaboratively, an approach NCEAS first innovated and institutions around the world now emulate. These teams do not collect new data, but synthesize and analyze existing data from many sources to uncover new and often big-picture insights that can inform policy and management. Given that data must be accessible and reproducible to be useful and effective for solutions-oriented science, we strive to advance discovery and scientific culture in the direction of open science.

Another aspect of our approach is building **partnerships** with other research institutions, nonprofits, and government agencies, which can expand scientific capacity and help apply the science to solutions. For example, we operate the US Long-Term Ecological Research (LTER) Network Office, a partnership with the National Science Foundation and have engaged in long-term partnerships with nonprofits such as The Nature Conservancy (TNC) and the Wildlife Conservation Society (WCS), along with private corporations like Microsoft AI for Earth and Universities around the world.

Our approach informs the three pillars of **our work**: research, data science, and training.

We lead synthesis and analytical research initiatives and projects that tackle big questions that would be difficult to answer with other scientific approaches. The following are current examples of our research:

- We lead the Ocean Health Index, a program that systematically assesses the health of the world's oceans annually for 220 coastal nations and territories, as well as at smaller regional scales. This program also prioritizes open and transparent methods for reproducible research, sharing code and providing training and support for independent groups interested in leading their own OHI assessments.
- We have partnered with Microsoft AI for Earth to investigate the potential of applying artificial intelligence to ecosystem assessments with the goal to identify opportunities that can help accelerate progress on ambitious goals for planetary health, such as the United States' 30 by 30 initiative to protect 30 percent of its lands and oceans by 2030 and the United Nations' Decade on Ecosystem Restoration, seeking to restore the world's ecosystems to reach Sustainable Development Goals by 2030.
- In partnership with UCSB's Bren School of Environmental Science and Management we host the new Master of Environmental Data Science (MEDS) Program, a degree program preparing students for a career advancing solutions to environmental problems through data science.

We also create innovative solutions for managing and analyzing environmental data, such as the following:

- Through our KNB Data Repository, we make thousands of environmental datasets – generated at NCEAS and elsewhere – publicly available for free allowing researchers to store their own data and access data from thousands of others, ultimately making science more transparent and reproducible.
- In partnership with DataONE and NOAA's National Center for Environmental Information, we run the Arctic Data Center to make available all data, software, and other research products associated with NSF-funded science in the Arctic for the sake of reproducibility.

Finally, we train early career and established researchers from around the world in best practices for open science and data management, especially with an application to synthesis research. Examples of this work include the following:

- Our Learning Hub is our knowledge-sharing community where, through trainings and resources, environmental researchers can learn the latest data science skills and technologies, enabling their science to inform solutions more quickly and effectively.
- We serve as a host institution for postdoctoral researchers, which typically support working groups, giving them experience coordinating research teams and designing their own synthesis research projects.
- We operate a mentorship program called Openscapes, which encourages early career researchers to establish best practices in and a culture around collaboration and open science in their labs.

NCEAS operates in downtown Santa Barbara in a facility that provides visiting researchers the physical and mental space for creativity and collaboration – important ingredients that foster the level of scientific output for which NCEAS is known. At the same time, NCEAS maintains strong ties to campus. Many working groups include UCSB faculty or researchers, and we employ and train a large cadre of UCSB graduate students in data management, scientific programming, and science communications.

In addition, the Center supports a community of resident researchers that concentrate on synthesis science or the development of computational approaches and tools to support synthesis science. NCEAS staff provides logistical and technical support, training, and outreach services to increase the productivity and impact of our researchers and working groups.

EXECUTIVE SUMMARY

NCEAS has been a staple of the UCSB and downtown Santa Barbara community for 27 years. On July 1, 2021, after 26 years in the same location, NCEAS transitioned to a new facility thanks to the support of UCSB and the Office of Research. Our new building is still located in the heart of downtown Santa Barbara, but this transition gave us the unique opportunity to design spaces specifically to meet our mission to transform Environmental Science, accelerate discovery, and generate solutions. We were able to renovate and design our new space to make it as conducive to big-picture thinking and team science as possible. The new space offers two large, fully equipped conference rooms, a sizeable classroom with a 90-person capacity, many smaller meetings areas and lounge spaces for formal and inform convenings, and an extensive outdoor terrace ideal for hosting get togethers throughout the year.

Emerging from the isolation of the COVID 19 pandemic and settling into our new home downtown, this last year has been one marked with many new, exciting beginnings and opportunities for NCEAS and the diverse scientific communities we support. First, in August 2021 we launched the new Masters of Environmental Data Science (MEDS) program in partnership with the Bren School of Environmental Science and Management at UCSB. Our first cohort of 25 students has brought an incredible amount of new energy, diversity, and curiosity to the NCEAS community and we are eager to see the program grow and continue to flourish in the years to come. We have also launched two new working group initiatives this year aimed at bringing together groups of experts from government agencies, NGOs, tribes, and academia to develop and accelerate science in the service of management solutions. The Morpho Initiative launched in Spring 2022 with the aims of advancing workforce development skills while creating scientific results that can inform solutions to urgent issues facing our changing planet - from wildfires to biodiversity loss and climate change. In partnership with the NOAA RESTORE program we have also launched the new Gulf Ecosystem Initiative, a five-year, \$3.5 million dollar program to bring working groups of scientists and decision makers together to collaborate to solve pressing questions across the Gulf of Mexico. Both of these new initiatives will have an annual competitive call for working group proposals to fund 2-3 working groups per initiative and the Gulf Ecosystem Initiative will also bring two new postdocs to NCEAS every year. We will also be offering enhanced Environmental Data Science and Science Communications trainings to these groups throughout their two-year projects at NCEAS. Each working group will be provided with tailored and targeted trainings in reproducible open data science, team science, data management and storage, facilitation, and communication to not only accelerate their science, but also build fundamental and advanced skills in the rapidly

evolving field of Environmental Science. We also successfully hosted multiple Environmental Data Science and SciComm trainings for our working groups and residents, ranging from photographing your science to team science and facilitation.

Over the course of the last year NCEAS was granted nearly three million dollars in awards and administered over 30 different funded programs. Together the center produced over 60 publications and received national and international media attention for our groundbreaking synthesis science and data science training. This year marked the 27th year of leadership in synthesis science, learning, and informatics at NCEAS.

Our scientific working groups and resident scientists led numerous advances and publications this year, spanning diverse and broad-ranging topics. For example, Our LTER Soil Organic Matter synthesis group has made some groundbreaking discoveries and progress towards understanding the dynamics that drive the persistence and turnover of soil organic matter, which contains two- to three-times the amount of carbon (C) as the atmosphere and terrestrial vegetation combined. This year the group not only created the SoDaH: the SOils DAta Harmonization database, an open-source synthesis of soil data from research networks, but were able to use this database to produce two high impact publications identifying productivity and temperature as controls on soil organic matter processing in key biomes (Georgiou et al. Biogeochemisty Letters, July 2021) and best practices for researchers who may collect organic matter data in the course of other research that would greatly improve the value of their data for modeling -- with only modest additional effort on their part (Billings et al. Ecological Applications, January 2021). The LTER network also produced a special issue in the journal Ecosphere entitled 'Forecasting Earth's Ecosystems with Long-Term Ecological Research', which highlights the importance of LTER research in the effort to understand mechanisms that aren't easily addressed by short-term studies, such as time lags, cascading effects, resilience, connectivity and ecosystem state change.

Our <u>Conservation Aquaculture Research Team (CART)</u> produced a number of papers tracking the impact of different food production systems including an analysis that maps the environmental pressures of global production for all foods on land and ocean (<u>Halpern et al. Nature Sustainability, 2022</u>) as well as a global map of the spatial distribution of global mariculture production (<u>Clawson et al. 2022</u>). Likewise, our marine researchers also produced an analysis tracking the source of nitrogen pollution affecting the world's second largest barrier reef showing that Agricultural operations are responsible for the vast majority of nitrogen pollution that flows into the Mesoamerican Reef Region (<u>Berger et al. 2022</u>). Additionally, NCEAS researchers were able to produce the first study to map the inputs of nitrogen and pathogens from

wastewater across 130,000 watersheds across the planet (<u>Tuholske et al. 2021</u>) and create a <u>data visualization</u> that maps globally the sources and destinations of nitrogen, a common element in both agricultural and human wastewater that causes eutrophication. NCEAS affiliated researchers and working groups also examined the many ways humans, animals, and ecosystems interact across space and time. Postdoc Kaitlyn Gaynor led a notable analysis exposing how animals react to and recover from large disturbances, such as wildfire. This group of researchers was able to track a group of black-tailed deer during and after California's third-largest wildfire, the 2018 Mendocino Complex Fire. The fire burned more than 450,000 acres in northern California, and burned across half of an established study site, providing a unique opportunity to record the movements and feeding patterns of deer before, during and after the fire (Gaynor et al. 2022).

Our diverse set of partnerships continue to make significant progress towards our shared NCEAS mission and substantial contributions to the scientific and informatics communities:

- The LTER Network Office (LNO) is the hub of scientific synthesis, education, and outreach activities for the Long Term Ecological Research Network, which links 28 NSF-funded research programs and over 2000 researchers working in every major U.S. biome. In 2021, the Network Office focused on improving virtual interactions across this widely distributed network. Synthesis working groups were unable to meet in person, so the Office scaled up support for long distance collaboration -- expanding training on reproducible research tools and adding virtual facilitation support. COVID has also spurred improvements in communication and transparency among the Network's array of committees and ad hoc interest groups. The first virtual meeting of the LTER Science Council occurred this year and made a series of 28 5-minute site talks--focused on upcoming research--accessible to a public audience.
- This year marks the 11th annual global <u>Ocean Health Index</u> assessment. With 11 years of assessments about where oceans are healthy and not as healthy, we finally have enough information to get a clear signal of what might be causing changes. Since 2018, the Ocean Health Index has been calculated by OHI fellows. The Ocean Health Index Global Fellowship was created to familiarize a small group of early-career data scientists with the inner workings of the OHI. With the objective of calculating OHI scores, the fellows dive into the theory, tools, and workflows employed by the larger team to ensure openness, transparency, and reproducibility. While fellows gain valuable experience and build useful skills, they also contribute fresh eyes and new perspectives that help

the OHI to continually grow and innovate. This program is an integral part of what the Ocean Health Index has accomplished thus far and what it is today.

- The new <u>Masters of Environmental Data Science (MEDS)</u> degree at UCSB, a
 partnership between NCEAS and the Bren School, successfully launched in
 August 2021 with the first cohort of 25 diverse and highly engaged students
 graduating in June 2022. Four graduates are now working at NCEAS full time in
 data manager, coordinator, and analyst positions. Half of graduates secured
 post-graduate positions prior to graduation. Alumni are now working in data
 science roles within academia, government agencies, and consulting firms.
- Our partnership with Microsoft's AI for Earth program has made great progress this year as we break new scientific ground investigating the potential of applying artificial intelligence to ecosystem assessments. This year we hosted a team of diverse expert scientists and practitioners to develop strategies for how the expansive community of conservation AI stakeholders (including technology companies, research scientists, government agencies, conservation NGOs, and philanthropic organizations) can best collaborate to make these advancements and generate innovative solutions.
- With support from California's Ocean Protection Council we initiated a working group to develop an understanding of how the State of California's network of MPAs has performed ecologically over the past decade, and the lessons those insights provide for future monitoring and management of the network. The project leveraged a working group of experts from within and outside CA to synthesize existing MPA monitoring data and data related to additional factors likely to influence MPA performance. The group focused on four main aspects of MPA evaluation: Ecological Performance, Habitat, Climate Resilience, and Human Engagement. This work informed California Department of Fish & Wildlife's Decadal Management Review.
- Over the last year, <u>DataONE</u> grew as a network, adding new <u>repository</u> <u>members</u> (as well as diversifying our service offerings to include a new <u>Hosted</u> <u>Repository</u> service where DataONE can efficiently operate a data repository on behalf of other projects and organizations as well as the new <u>DataONE Plus</u> program, allowing individual researchers and labs to build their own custom portals within the DataONE network.
- The NSF-funded <u>Arctic Data Center</u> was <u>renewed for an additional 5 years</u> of operations to serve the data and software preservation needs of the Arctic research community. Growth in the archive continues to accelerate (growing by tens of terabytes in size each year), and the Center has begun tackling new disciplinary challenges, such as better support services for social science research, and for handling sensitive data submissions. New data submission

features have been added to improve data discovery, and we worked extensively with collaborators who are helping us to build the <u>Permafrost</u> <u>Discovery Gateway</u> with high-resolution geospatial features showing sub-meter permafrost features at global extents. The Arctic Data Center also sponsored 8 Data Science Fellows, who worked on diverse data projects spanning the Arctic while learning new data science skills and approaches, and we taught a <u>week-</u> <u>long intensive short course</u> on Reproducible Research in R for Arctic researchers.

 The <u>SeaSketch</u> team rolled out the new SeaSketch Survey tool which was deployed for gathering data on how ocean space is used in The Azores, The Maldives, Fiji, Samoa and Norway. For this work, we partnered with Blue Prosperity Coalition which included the Waitt Institute, foreign government ministries and NGOs such as CI and IUCN. In The Maldives, we completed a massive ocean uses survey in which Maldivian facilitators used SeaSketch to collect an astounding 4,854 responses representing 39,310 individuals across all ocean use sectors including commercial, recreational and artisanal fishing, transportation, research and monitoring, tourism and community uses. The resulting data are now being used to develop marine protected areas covering 20% of the Maldives Exclusive Economic Zone.

The NCEAS <u>Learning Hub</u> continued to grow and advance over the last year, creating new curricula, courses, and partnerships. Our Learning Hub for environmental data science aims to build a knowledge-sharing and skills-building community where environmental researchers can learn the latest data science skills and technologies.

NCEAS has continued to center significant efforts around Diversity, Equity, and Inclusion (DEI) over the past year. Our NCEAS Diverisity Committee has grown significantly and has recently updated our existing <u>Strategic Plan for Diversity, Equity,</u> and Inclusion and <u>Code of Conduct</u>, and has developed and implemented a hiring process aimed at increasing diversity across our staff and scientists. We also significantly updated our <u>Welcome Website</u> to include new and expanding resources to support a diversity of people coming to NCEAS to work in residence or as part of a working group. We also hosted our second annual virtual seminar series this year entitled 'Advancing Ecology and Environmental Data Science for a More Just and <u>Equitable Future</u>' where speakers shared their research approaches and findings as they relate to the intersections of ecology, environmental data science, equity, and environmental justice. This seminar series was the best attended of any hosted on campus this year and the individual <u>talk recordings</u> have continued to garner much attention.

Five-Year Projection Update

Overall, our five-year plan has not changed, and I am pleased to highlight additional milestones that showcase our progress:

- Residents, working group, training, and workshop participants have been incredibly eager to participate in in-person convenings at NCEAS following the cessation of in-person meetings during the pandemic. We have been welcoming groups back in great numbers this year and we have had a visiting working group meeting at NCEAS every week this Fall 2022.
- Our resident postdoc community included 9 members, with 5 additional members joining in the coming months. This vibrant community of early career researchers is a fundamental part of the identity, creativity, and productivity of NCEAS and we are excited to see it grow and expand in both number and disciplinary focus.
- The National Science Foundation (NSF) funded <u>Arctic Data Center</u> has increased its technical and community support capacity this year and has hosted a number of environmental data science trainings specifically aimed at bringing new skills and opportunities to the Arctic research community.
- We continue to engage and nurture ongoing and strong partnerships with international conservation organizations, including The Nature Conservancy, The Dangermond Preserve and Point Conception Institute, and Conservation International. Our Partnership with The Dangermond Preserve and Point Conception Institute has been especially active this year as we hosted the three-day PCI Initiative Visioning Workshop at NCEAS and house the Preserve's staff at our facility.
- We have added an additional two members to our Director's Council, which continues to be a great support system for our science and diversity initiatives. The Council met in-person twice this year including a day-long field trip to the newly established Jack and Laura Dangermond Preserve, which was a real treat for everyone. We continue to seek additional members who will serve to help NCEAS with high-impact development and fundraising efforts, and potentially contribute to our strategic direction.

As I look towards the future and my eighth year as the Director of NCEAS I see a bright, diverse, and revolutionary path ahead. The last twelve months at NCEAS have truly been transformational as we have opened a brand-new facility, welcomed new working group initiatives, visitors, and residents, made great strides in diversifying and growing the Environmental Data Science community, and advanced cutting-edge science in support of people and this planet we call home. I would especially like to thank the Office of Research for its deep commitment to NCEAS, and all of our partners and funders in these endeavors, including the Zegar Family Foundation, the

Gordon and Betty Moore Foundation, the David and Lucile Packard Foundation, the National Philanthropic Trust, the National Science Foundation, the Waitt Foundation, Conservation International, Microsoft, National Geographic, BOEM, our partners at The Nature Conservancy, the Point Conception Institute and our many other contributors for their support. I also want to acknowledge and thank the State of California and the leadership of UC Santa Barbara for their continued support of and commitment to NCEAS.

Forger S. Hele

Ben Halpern, Executive Director National Center for Ecological Analysis and Synthesis (NCEAS)

PEOPLE OF NCEAS

ORGANIZATION CHART



ADVISORY COMMITTEE

- Cherie Briggs, Committee Chair, EEMB
- Kelly Caylor, Geography, Bren
- Krzysztof Janowicz, Geography
- Kyle Lewis, Technology Management Program
- Marko Peljhan, Media Arts and Technology
- Leah Stokes, Political Science
- Rich Wolski, Computer Science

Ex-Officio Members:

• Ben Halpern, Director, NCEAS

ADMINISTRATIVE STAFF

- Michelle Morris, Business Officer
- Courtney Scarborough, Deputy Director
- Ana Peters, Contracts & Grants Analyst
- Isabel Clark, Financial Analyst
- Ginger Gillquist, Event Coordinator/Director's Assistant

TECHNICAL STAFF

- Madeline Berger, Analyst
- Jenna Braun, Analyst
- Julien Brun, Scientific Programmer
- Chad Burt, Applications Programer
- Melanie Frazier, Scientific Programmer
- Thomas Hetmank, Programmer/Analyst
- Matt Jones, Director of Research & Development NCEAS Data Science
- Jasmin Lai, Data Systems Analyst
- Bryce Mecum, Science Software Engineer
- Peter Menzies, Analyst
- Neil Nathan, Analyst
- Rushiraj Nenuji, Software Engineer
- Nicolas Outin, System Administrator
- Mark Schildhauer, Center Associate
- Peter Slaughter, Software Engineer

- Jing Tao, Software Engineer
- Thomas Thelen, Software Engineer
- Daphne Virlar-Knight, Analyst
- Lauren Walker, Software Designer
- Tim Welch, Software Engineer
- Daniel Yocum, Applications Programmer

ALL OTHER STAFF

Academic Coordinators

- Amber Budden, Director of the Learning Hub (NCEAS)
- Gage Clawson, Ocean Health Index (NCEAS)
- Haline Do-Linh, Data Training Program Manager (NCEAS)
- Marty Downs, Deputy Director (LTER NCO)
- Alex Phillips, NCEAS Communications and Policy Officer
- Heather Lahr, Project Coordinator (NCEAS/EmLab)
- Natasha Haycock-Chavez, Arctic Data Center Outreach Coordinator
- Sam Csik, MEDS Data Training Coordinator (NCEAS/MEDS)
- Geoff Willard, Deputy Director (SNAPP)

Specialists

- Chris Belt, Assistant Specialist
- Susan Clark, Associate Specialist
- Annie Colgan, Assistant Specialist
- Juliette Verstaen, Assistant Specialist
- Danielle Ferraro, Associate Specialist
- Tess Hooper, Assistant Specialist
- Wai-Yin Kwan, Assistant Specialist
- Haley Epperly, Associate Specialist
- Juliet Cohen, Associate Specialist
- Therese Azevedo, Associate Specialist
- Carmen Galaz-Garcia, Associate Specialist
- Nick Lyon, Associate Specialist
- Angel Chen, Jr. Specialist
- Paul-Eric Rayner, Jr. Specialist

- Maya Samet, Jr. Specialist
- Althea Marks Jr. Specialist
- Kristen Peach, Jr. Specialist

Researchers

- Jennifer Caselle, Researcher
- Chris Costello, Researcher
- Frank Davis, Researcher
- Olivier Deschenes, Researcher
- Jeff Dozier, Researcher
- Halley Froehlich, Researcher
- Carrie Kappel, Researcher
- Chris Lortie, Researcher
- Andrew Plantiga, Researcher

Project Scientists

- Julia Lowndes, Associate Project Scientist
- Cat Fong, Assistant Project Scientist
- Will McClintock, Assistant Project Scientist

STATISTICAL SUMMARY

	UC SANTA BARBARA			
Research Division				
	Statistical Summary			
Department: Fiscal Year:	NCEAS 2021-2022			
Personnel en	gaged in research (head count):			
Faculty		5		
Professional R	esearchers (including Visiting)	3		
Project Scienti	sts	3		
Academic Coc	ordinators	9		
Specialists		13		
Postdoctoral S	Scholars	9		
Postgraduate	Postgraduate Researchers			
Graduate Stuc	dents	8		
Undergraduat	e Students	10		
Technical & Re	esearch Staff	4		
	Total	52		
Participation	from outside UCSB (head count): (optional)			
Academics (wi	thout Salary Academic Visitors)	5		
Other (working	g group participants)	518		
	523			
Unit Operation	onal Staff (# of FTE):			
Administrative	7			
Computing	19			
Technical & Se	ervice (e.g. recharge personnel, lab manager)	0		
Programmatic	Staff	0		
	Total	26		
Sponsored R	esearch:			
Number of Pri	ncipal Investigators*	9		

Proposals submitted (#)	25
Proposals submitted (\$ value)	58,164,050
Awards issued (#)	15
Awards issued (\$ value)	2,747,446
Extramural awards administered during year (#)**	32
Extramural awards administered during year (\$ value)***	26,005,472.90
Costshare funds managed during year (\$ value)**	~
Awarding agencies dealt with (#)****	20
Other Projects & Progams:	
Seminars, symposia, workshops sponsored (#)	28
Other projects administered (#)****	14
Other projects administered (\$ value)*****	197,369.60
Intramural support administered (\$ value)**	~
Budget & Space:	
Total base budget for the year	551,992
Total assigned square footage in ORU	14,302

PRINCIPAL INVESTIGATORS

Amber Budden	Center Associate	National Center for Ecological Analysis and Synthesis
Jennifer Caselle	Associate Research Biologist	Marine Science Institute
Chris Costello	Professor	Bren School
Frank Davis	LTER Network Office Executive Director	National Center for Ecological Analysis and Synthesis
Olivier Deschenes	Professor	Economics

Marty Downs	LTER Network Office Director	National Center for Ecological Analysis and Synthesis
Jeff Dozier	Professor	Bren School
Halley Froehlich	Professor	Environmental Studies
Benjamin Halpern	Professor	Bren School
Andrew Plantiga	Professor	Bren School
Matthew Jones	Director of Informatics, Research, and Development	National Center for Ecological Analysis and Synthesis
Carrie Kappel	Researcher	National Center for Ecological Analysis and Synthesis
Christopher Lortie	Researcher	National Center for Ecological Analysis and Synthesis
Julia Stewart Lowndes	Project Scientist	National Center for Ecological Analysis and Synthesis
William McClintock	Project Scientist	Marine Science Institute
Todd Oakley	Researcher	Ecology, Evolution, and Marine Biology
Mark Schildhauer	CNT V	National Center for Ecological Analysis and Synthesis

POSTDOCTORAL FELLOWS, GRADUATE AND UNDERGRADUATE STUDENTS

Postdoctoral Fellows

- Michael Eggen
- Caitlin Fong
- Whitney Friedman
- Kaitlyn Gaynor
- Ingrid Slette
- Joshua Smith
- Erin Satterthwaite
- Marcus Thomson
- Michael Weir

Graduate Students

- Alessandra Vidal Meza
- Cori Lopazanski
- Erika Egg
- Casey O'Hara

Undergraduate Students

- Hannah Malak
- Chris Kracha
- Ranna Zahabi
- Ankita Pattnaik
- Rylee Pupa
- Anum Damani
- Anurag Rao
- Nandita Raghuraman

EXTERNAL PARTICIPATION

ACTIVITY	FIRST	LAST	INSTITUTION
2022 LTER Science Council Meeting	Ana	Aguilar-Islas	University of Alaska, Fairbanks
	Merryl	Alber	University of Georgia
	Matthew	Betts	Oregon State University

	Annette	Brickley	Woods Hole Oceanographic Institution
-	Renee	Brown	University of New Mexico
	Daniel	Childers	Arizona State University
	Megan	Cimino	National Oceanic and Atmospheric Administration (NOAA)
	Scott	Collins	University of New Mexico
	Stevan	Earl	Long Term Ecological Research (LTER)/Central Arizona-Phoenix (CAP)
	Sarah	Garlick	Hubbard Brook Research Foundation
	Anne	Giblin	The Ecosystems Center
	Christine	Goodale	Cornell University
	Michael	Gooseff	University of Colorado, Boulder
	Corinna	Gries	University of Wisconsin, Madison
	Kevin	Griffin	Columbia University
	Peter	Groffman	City University of New York (CUNY)
Nich Niall Jona	Nicholas	Haddad	Michigan State University
	Niall	Hanan	New Mexico State University
	Jonathan	Henn	University of California, Riverside
	Russell	Hopcroft	University of Alaska, Fairbanks
	Bonnie	Keeler	University of Minnesota
	Alan	Кпарр	Colorado State University
	John	Kominoski	Florida International University
	Kelli	Larson	Arizona State University
	Joel	Llopiz	Woods Hole Oceanographic Institution
	Steve	Loheide	University of Wisconsin, Madison
	Michelle	Mack	Northern Arizona University
	James	McClelland	University of Texas
	Kendra	McLauchlan	National Science Foundation
	Susanne	Menden-Deuer	University of Rhode Island
-	Michael Paul	Nelson	Oregon State University
	Christopher	Nytch	University of Puerto Rico
	Mark	Ohman	University of California, San Diego
	Michael	Rawlins	University of Massachusetts

	Matthew	Reidenbach	University of Virginia
	Jennifer	Rudgers	University of New Mexico
	Osvaldo	Sala	Arizona State University
	Mark	Salvatore	Northern Arizona University
	Blair	Schneider	University of Kansas
	Oscar	Schofield	State University of New Jersey, Rutgers
	Eric	Seabloom	University of Minnesota
	Melinda	Smith	Colorado State University
	Heidi	Sosik	Woods Hole Oceanographic Institution
	Katharine	Suding	University of Colorado, Boulder
	Jonathan	Thompson	Harvard University
	Kristin	Vanderbilt	University of New Mexico
	Nathaniel	Weston	Villanova University
	Jess	Zimmerman	University of Puerto Rico, Rio Piedras Campus
	Luke	Gardner	University of California, San Diego
	Noah	Ben-Aderet	California Ocean Protection Council
Aquaculture Action Plan	Mark	Gold	California Ocean Protection Council
	Craig	Shuman	Reef Check California
	Cassidy	Teufel	California Coastal Commission
	Matias	Braccini	Department of Primary Industries and Regional Development
	Demian	Chapman	Mote Marine Laboratory
	Joshua	Cinner	James Cook University
	Simon	Dedman	Florida International University
	Nick	Dulvy	Simon Fraser University
Ecological Importance of	Ruth	Dunn	Lancaster University
Sharks	Nicholas	Graham	Lancaster University
	Alastair	Harborne	Florida International University
	Michael	Heithaus	Florida International University
	Michelle	Heupel	James Cook University
	Charlie	Huveneers	Flinders University
	Natalie	Klinard	Dalhousie University

	Alison	Kock	South African National Parks
	Jason	Link	NOAA, National Marine Fisheries Service (NMFS)
	Chris	Lowe	California State University, Long Beach
	Aaron	MacNeil	Dalhousie University
	Elizabeth	Madin	University of Hawaii
	Jerry	Moxley	Florida International University
	Yannis	Papastamatiou	Florida International University
	Colin	Simpfendorfer	James Cook University
	M. Timothy	Tinker	US Geological Survey (USGS) Santa Cruz Field Station
	Megan	Winton	Atlantic White Shark Conservancy
	Aaron	Wirsing	University of Washington
	Jessica	Black	University of Alaska, Fairbanks
	Courtney	Carothers	University of Alaska, Fairbanks
	Freddie	Christiansen	Old Harbor Native Corporation
	Rachel	Donkersloot	Coastal Cultures Research and Consulting
Indiaenizina	Janessa	Esquible	Orutsararimut Native Council
Salmon Science &	Wilson	Justin	University of Alaska, Anchorage
Management	Danielle	Ringer	University of Alaska, Fairbanks
	Jonathan	Samuelson	Kuskokwim River Inter-Tribal Fish Commission
	Carrie	Stevens	University of Alaska, Fairbanks
	Michael	Williams	Akiak Native Community
	Brooke	Woods	University of Alaska
	Annie	Brett	University of Florida
	Emily	Jackzo	University of Florida
	Keith	Porcaro	Duke University
SeaBED	Kyla	Van Maanen	Intertidal Agency
	Stefaan	Verhurst	New York University
	Kate	Wing	Intertidal Agency
	Andrew	Young	New York University
	Andrew	Zahuranec	New York University
	Alba	Aguion	University of Vigo

	Edward	Allison	University of Washington
	Mark	Dickey-Collas	International Council for the Exploration of the Sea (ICES)
	Jacob	Eurich	Environmental Defense Fund
	Whitney	Friedman	Thriving Oceans Collective
	Christopher	Golden	Harvard University
Resilient Fisheries	Kristin	Kleisner	Environmental Defense Fund
	Julia	Mason	Environmental Defense Fund
	Katherine	Mills	Gulf of Maine Research Institute
	Patrick	Sullivan	Cornell University
	Alice	Thomas-Smyth	Environmental Defense Fund
	Mireia	Valle Tobar	Basque Centre for Climate Change
	Derek	Brandis	South Dakota State University
	Briana	Doering	University of Wyoming
	Go	Iwahana	University of Alaska
	Alexander	Kholodov	University of Alaska, Fairbanks
	Steffi	Kim	University of Minnesota
	Emma	Kimball	University of Alaska
	Bishnu	Kunwar	South Dakota State University
ADC Training	Elizabeth	Lindley	University of Alaska, Fairbanks
	Larisa	Ozeryansky	University of Washington
	Joshua	Paul	University of Alaska
	Rachel	Roberts	University of Alaska
	Margaret	Rudolf	University of Alaska, Fairbanks
	Marcel	Velasquez	Laval University
	John	Ziker	Boise State University
	Pedro	Bergamo	Rio de Janeiro Botanical Garden
Reproducible	Catarina	Jakovac	Wageningen University
Research Techniques for	Todd	Miller	National Oceanic and Atmospheric Administration (NOAA)
Synthesis Training	Christine	O'Connell	Macalester College
Workshop	Kirsten	Oleson	University of Hawaii, Manoa
	Lauren	Pandori	National Park Service

	Fletcher	Sewall	National Oceanic and Atmospheric Administration (NOAA)
	Cindy	Tribuzio	National Oceanic and Atmospheric Administration (NOAA)
	Svetlana	Yegorova	University of Montana
	Clarissa	Anderson	University of California, San Diego
	Mark	Carr	University of California, Santa Cruz
	Joachim	Claudet	Centre National de la Recherche Scientifique (CNRS)
	Tessa	Francis	University of Washington, Tacoma
	David	Gill	Duke University
	Kristin	Kaschner	University of Freiburg
	Rosa	Laucci	Tolowa Dee-ni' Nation
California MPA	Heather	Leslie	University of Maine
Assessment	John	Lynham	University of Hawaii, Manoa
	Laurence	McCook	James Cook University
	David	Mouillot	Université de Montpellier II
	Kerry	Nickols	California State University, Northridge
	Peter	Raimondi	University of California, Santa Cruz
	Rick	Starr	University of California Sea Grant Extension Program
	Shelby	Zeigler	San Jose State University
	Scott	Hamilton	San Jose State University
	Rodrigo	Camara-Leret	University of Zurich
	Jeannine	Cavender-Bares	University of Minnesota, Twin Cities
	Rebecca	Chaplin Kramer	Stanford University
	Sandra	Diaz	Universidad Nacional de Córdoba, CONICET
	Ehsan	Dulloo	Bioversity International
FltBiTs	Lucas	Garibaldi	Universidad Nacional de Rio Negro
	Colin	Khoury	Saint Louis University
	Sandra	Lavorel	Université J. Fourier, Grenoble I
	Thomas	Mueller	Senckenberg Naturmuseum Frankfurt
	Jesus	Pinto-Ledezma	University of Minnesota
	Andy	Purvis	Imperial College, London, Silwood Park Campus

	Delphine	Renard	Centre d'Ecologie Fonctionnelle et Evolutive-CEFE
	Victoria	Reyes-Garcia	Universitat Autonoma de Barcelona
	James	Rosindell	Imperial College London
	Lynne	Shannon	University of Cape Town
	Jason	Tylianakis	University of Canterbury
	Peter	Verburg	Vrije Universiteit Amsterdam
	Noelia	Zafra-Calvo	Future Earth
	Jessica	Gephart	American University
	Christina	Hicks	Lancaster University
Food Equity	Kirsty	Nash	University of Tasmania
	David	Williams	University of Leeds
	Maggie	Anderson	University of Minnesota
	Jeffrey	Dukes	Purdue University
	Laureano	Gherardi	University of California, Berkeley
LTER Drought	Martin	Holdrege	Utah State University
Global Synthesis	Timothy	Ohlert	University of New Mexico
	Richard	Phillips	Indiana University
	Peter	Wilfahrt	University of Minnesota
	Kate	Wilkins	Colorado State University
	Benjamin	Abbott	University of Brighton
	Joanna	Carey	Babson College
	Linda	Deegan	Marine Biological Laboratory
	Ruth	Heindel	Kenyon
	Kathijo	Jankowski	US Geological Survey (USGS)
	Keira	Johnson	Oregon State University
	Jeremy	Jones	University of Alaska, Fairbanks
LTER River Si	Paul	Julian	Sanibel-Captiva Conservation Foundation
Exports	William	McDowell	University of New Hampshire
	Diane	McKnight	University of Colorado, Boulder
	Lienne	Sethna	Indiana University
	Arial	Shogren	Michigan State University
	Pamela	Sullivan	Oregon State University
	Patrick	Thomas	Carl von Ossietzky University Oldenburg
	Wilfred	Wollheim	University of New Hampshire
	Adam	Wymore	University of New Hampshire
	Jessica	Barton	DePaul University
	David	Bell	USDA Forest Service
	Bala	Chaudhary	Dartmouth College
LIEK: Plant	Natalie	Cleavitt	Cornell University
Drivers	Elizabeth	Crone	Tufts University
	David	Greene	Humboldt State University
	Penelope	Holland	University of York
	Inés	Ibañez	University of Michigan

	Jill	Johnstone	University of Saskatchewan		
	Walt	Koenig	Cornell University		
	Jalene	LaMontagne	DePaul University		
	Diana	Macias	University of New Mexico		
	Thomas	Miller	Rice University		
	Katherine	Nigro	Colorado State University		
	lan	Pearse	Fort Collins Science Center, USGS		
	Miranda	Redmond	Colorado State University		
	Akiko	Satake	Kyushu University		
	Mark	Schulze	Oregon State University		
	Rebecca	Snell	Ohio University		
American Southwest Carbon Marketplace	Gitanjali	Bodner	The Nature Conservancy		
	Jennifer	Gooden	Biophilia Foundation		
	Kris	Hulvey	Working Lands Conservation		
	Aaron	Lien	University of Arizona		
	Todd	Lopez	Rio Grande Return		
	Ruth	Musgrave	National Coalition of Environmental Legislators (NCEL)		
	Laura	Norman	US Geological Survey (USGS)		
	Richard	Pritzlaff	Biophilia Foundation		
	Nicole	Rosmarino	Southern Plains Land Trust		
	Rose	Smith	Sageland Collaborative		
	Greg	Costello	Wildlands Network		
	Breanna	Owens	Western Landowners Alliance		
	Michael	Bell	The Nature Conservancy		
	D. Richard	Cameron	The Nature Conservancy		
PCI Initiative	Katherine	Chadwick Jet Propulsion Laboratory of the National			
			Aeronautics and Space Administration (NASA)		
	Jack	Dangermond	Environmental Systems Research Institute (ESRI)		
	Laura	Dangermond	Environmental Systems Research Institute (ESRI)		
	Kelly	Easterday	The Nature Conservancy		
	Mary	Gleason	The Nature Conservancy		
	Elizabeth	Hiroyasu	The Nature Conservancy		
	Brian	Holguin	University of California, Los Angeles		
visioning workshop	C. Melissa	Miner	University of California, Santa Cruz		
	Alex	Norton	Legacy Works Group		
	Ruth	Oliver	Yale University		
	Natalie	Queally	University of Wisconsin, Madison		
	Mark	Reynolds	The Nature Conservancy		
	Sabrina	Shirazi	Smithsonian Institution		
	Damian	Spangrud	Environmental Systems Research Institute (ESRI)		
	Michael	Sweeney	The Nature Conservancy		
	Dave	Thau	World Wildlife Fund		
	Dawn	Wright	Environmental Systems Research Institute (ESRI)		

Charles	Zegar	Zegar Family Foundation
Merryl	Zegar	Zegar Family Foundation

ACADEMIC PROJECTS: WORKING GROUPS, MEETINGS, TRAININGS

Name	Activity Type	Leader	Start	End
2022 LTER Science Council Meeting	Meeting	Davis	5/16/2022	5/18/2022
Aquaculture Action Plan	Working Group	Halpern	8/26/2021	8/27/2021
Ecological Importance of Sharks	Working Group	Halpern	6/14/2022	6/16/2022
Indigenizing Salmon Science & Management	Working Group	Halpern	3/28/2022	3/31/2022
SeaBED	Working Group	Halpern	3/24/2022	3/25/2022
SNAPP Climate Resilient Fisheries	Working Group	Halpern	2/22/2022	2/25/2022
California MPA Network Decadal	Working Group	Halpern	6/28/2021	7/1/2021
Assessment				
FItBiTs	Working Group	Halpern	8/31/2021	9/2/2021
Food Equity	Working Group	Halpern	10/25/2021	10/27/2021
LTER Drought Global Synthesis	Working Group	Wilkins	4/4/2022	4/7/2022
LTER River Si Exports	Working Group	Carey	3/14/2022	3/17/2022
LTER: Plant Reproductive Drivers	Working Group	LaMontagne	4/25/2022	4/28/2022
American Southwest Carbon Marketplace	Workshop	Halpern	11/8/2021	11/10/2021
PCI Initiative visioning workshop	Workshop	Halpern	3/16/2022	3/18/2022
ADC Training	Training	Jones	4/18/2022	4/22/2022
	Workshop			
Reproducible Research Techniques for	Training	Jones	7/8/2021	7/14/2021
Synthesis Training	Workshop			

PUBLICATIONS

Journal Articles

Austin, Kemen; Heilmayr, Robert; Benedict, Jason J; Burns, David; Eggen, Michael ; Grantham, Hedley; Greenbury, Aida; Hill, Jane; Jenkins, Clinton; Luskin, Matthew; Manurung, Timer; Vang Rasmussen, Laura; Rosoman, Grant ; Rudorff, Bernardo; Satar, Musnanda; Smith, Charlotte; Carlson, Kimberly. 2021.Mapping and Monitoring Zero-Deforestation Commitments. BioScience. https://doi.org/10.1093/biosci/biab082

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 K.; Wohlgemuth, Thomas ; Zimmermann, Niklaus E.. 2020.Presence-only and
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SPACE

This year NCEAS transitioned to a newly renovated location in downtown Santa Barbara after 26 years in the Balboa Building. This new location at 1021 Anacapa Street, Santa Barbara, CA 93101-5504 Street remains approximately 8.5 miles from the main UC Santa Barbara campus.

1021 Anacapa Layout:



First floor layout. NCEAS occupies the entire main suite of the first floor to the left of the parking garage, including 9 offices, a large classroom, two lounges, and two restrooms.



Third floor plan. NCEAS occupies the entire third floor of the building, including 19 offices, three conference rooms, four restrooms, and a large outdoor terrace.