

The Point Conception Institute

2023 Science Symposium

Ongoing research, findings, and collaborations.

University of California Santa Barbara, Mosher Hall, March 17, 2023



UC SANTA BARBARA
Geography

The Nature
Conservancy 



JACK & LAURA
DANGERMOND
CONSERVATION
FOUNDATION

Background

The Nature Conservancy's (TNC) Jack and Laura Dangermond Preserve is one of the last places in Southern California that remains largely untouched by development. Exceptional in size, location, and biodiversity, Point Conception and its surrounding lands comprise one of the last and best "wild coast" areas in Southern California. The Preserve's unusual geography makes it a globally important site for conservation. The coastline runs north-south above Point Conception and east-west below it; cold currents from the north collide with warm water from the Santa Barbara Channel, creating diverse marine and terrestrial habitats unlike any others in the state. The Preserve stretches from the coast to the Santa Ynez Mountains and includes chaparral, grassland, oak woodlands, coastal scrub, and closed-cone pine along eight miles of wild coastline.

Through a generous donation from Jack and Laura Dangermond, in December 2017 TNC acquired over 24,000 acres of a former private ranch at Point Conception. Since the acquisition of the property, TNC has completed a comprehensive [Dangermond Preserve Integrated Resources Management Plan](#) that sets the vision and foundation for the preserve's management into the future. In acquiring the Jack and Laura Dangermond Preserve, The Nature Conservancy's first responsibility is to build a nature preserve capable of protecting this irreplaceable collection of natural and cultural resources for the benefit of future generations. With so many possibilities, the Dangermond Preserve team engaged the conservation science community in a series of workshops and meetings to identify the path forward for science at the preserve, hone in on research initiatives that would best leverage the preserve's unique attributes and build and share progress with our research community. This effort resulted in three events over recent years. PCI has come a long way in the past five years, which is made possible by our sponsors, partners, researchers and our conservation science community. Thank you for your continuing support.

The Launch of the Point Conception Institute

In 2019, TNC, the University of California, Santa Barbara (UCSB), and Esri came together to develop a plan to launch a new entity, the Point Conception Institute (PCI), for the purpose of using the preserve as a globally strategic conservation asset to pioneer critically needed innovations in conservation. Part of that planning process included a four-day Specialist Meeting held in Santa Barbara in March of 2019, supported by the National Center for Ecological Analysis and Synthesis (NCEAS) and involving 40 conservation scientists from top institutions around the world. The purpose of the meeting was to collaboratively explore the need, opportunities, and the best role for this new conservation enterprise. After spending a day touring the Dangermond Preserve, the group embarked on a two-day facilitated discussion around how this unique place and the enterprise associated with it could make a meaningful and needed impact in the field of conservation today. From this Specialist Meeting emerged a vision for PCI, an institute based at the preserve and designed to channel the power of open science to tackle urgent global challenges of climate change and biodiversity loss through collaborative research, open data, and innovative technology. The goal: to develop ways to learn better and faster to advance bold conservation action on the preserve and beyond. For more information about the Specialist Meeting, please click [here](#) for the synthesis of the event. Organization of the Specialist Meeting was led by TNC in partnership with UCSB and Esri. Funding was provided by Jack and Laura Dangermond and UCSB.



@Karin Lin/TNC| Point Conception Institute Specialist Meeting, Upham Hotel, Santa Barbara, 2019

Designing for Impact

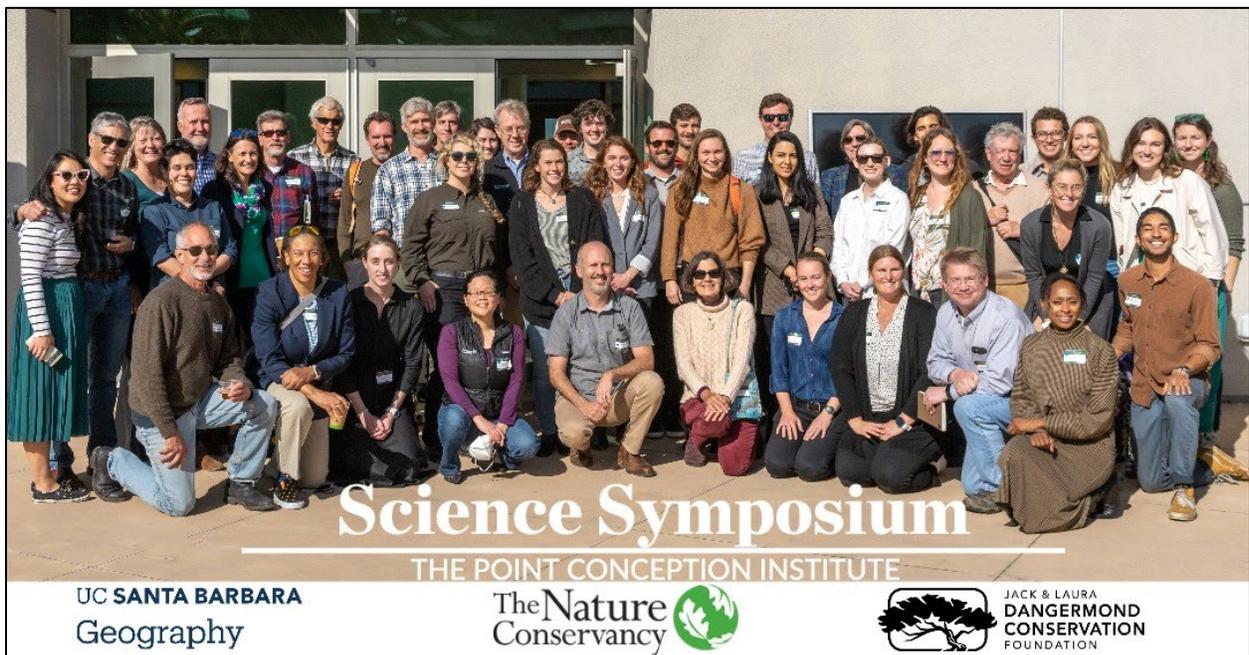
After the Specialist Meeting, TNC staff focused on building partnerships, building out staff capacity, and expanding research at the preserve. In March 2022, TNC and its partners convened again to build on the momentum for the vision of PCI, its impact model, and for advancing strategic research initiatives and the technology, systems, and practices that will enable their success. Participants included representatives from the core partners—TNC, Esri, UCSB and NCEAS—and investigators from each initiative. Dr. Carrie Kappel and Alex Norton provided facilitation. While field work had begun for many of the researchers in the room, they had mostly been working in isolation, without opportunities to connect with other PCI researchers. The workshop’s intended outcomes focused around building the research community and identifying cross-cutting needs and opportunities to strengthen PCI’s current research initiatives and their impact pathways. For a synthesis of the PCI Initiatives Visioning Workshop, please click [here](#).



@Ginger Gillquist/NCEAS| Point Conception Institute Initiatives Workshop, National Center for Ecological Analysis and Synthesis 2022

The Inaugural PCI Science Symposium

In March 2023, PCI and UCSB Geography hosted the inaugural PCI Science Symposium. Over 70 members of our conservation science community came out to learn about research happening at the Dangermond Preserve. Symposium organizers aimed to provide a program comprised of presenters and panelists that featured the breadth of disciplines and career levels that make up the research enterprise at the Dangermond Preserve. The symposium included nine presentations and two panels and closed out with a reception on Whalen Plaza. Support was provided by staff members from both TNC and UCSB. Funding for the workshop was provided by the Jack and Laura Dangermond Conservation Foundation. To access the PCI Science Symposium participant packet that includes the program, speaker biographies, presentation abstracts, and featured projects, please click [here](#).



Motivation

From the beginning, PCI has looked for ways to leverage research at the preserve for bigger impact that can support the goals of protecting, restoring, and managing the preserve. In the years since acquiring the property, over 70 unique research projects have been conducted, leading to an expanding body of knowledge of the preserve and its ecosystems. From breakthroughs in groundwater science, to new insight on the movement of mountain lions at the coast and shifts in our understanding of the timeline of human occupation through historical human ecology and archeology, research has informed on-the-ground management across the region. Through restoration and planting of over 6,000 coast live oaks and work highlighting the expansive biodiversity in the intertidal and nearshore communities, the preserve and its diversity of biological, ecological, and human history continue to a living laboratory for discovery that highlights the urgency of conservation work during this critical time.

One of PCI's goals has always been to broaden engagement and deepen collaborations within the conservation science community, and organizers heard a real need for that at the 2022 PCI Initiatives

Visioning Workshop. Researchers were seeking to break free from their silos and find synergy and opportunities for cross-disciplinary collaborations and increased impact by learning about each other's research. Through the PCI Science Symposium, organizers highlighted a broad range of projects currently underway, while providing opportunity for attendees to engage in conversation expand collaborations. Cross-cutting panels featured researchers from a variety of disciplines to share their thoughts on how to expand the impact of the Dangermond Preserve and PCI.

Presentations

A total of nine researchers were featured at the one-day symposium, each giving a 10-minute presentation followed by a 5-minute Q&A. After the welcome ([recording link](#)), presentations were organized by theme, with the morning session focused on "What makes the Dangermond Preserve unique?" The session was focused on the unique opportunities that the Dangermond Preserve offers for research that cannot be done anywhere else in the world. The afternoon centered the question, "How can the Dangermond Preserve be a platform for the conservation community?" Organizers focused the second session on how research conducted at the Dangermond Preserve can move the field of conservation forward at a faster pace and larger scale. Presentations wrapped with this closing ([recording link](#)) For more information about speakers and panelists, you can find their biographies [here](#).

Morning Session: What Makes the Dangermond Preserve Unique?

Presentation 1: Data for Conservation: Components of the Dangermond Preserve Digital Twin

Presenter: Kelly Easterday, PCI and Dangermond Preserve Director of Conservation Technology, TNC

Resources: ([presentation recording](#), [presentation slides](#))

In this talk, Dr. Easterday walked through some of the main data, models, and tools that are being used to create the Dangermond Preserve Digital Twin and discussed how they are currently being used in conservation applications.

Presentation 2: Geomorphology and Future Restoration of the Point Conception Headland Bypass Dune System at the Jack and Laura Dangermond Preserve

Presenter: Madison Heffentrager, UCSB

Resources: ([presentation recording](#), [presentation slides](#))

In this presentation, researchers described the geomorphic history and modern processes of the unique, cliff-top headland bypass dune system located at the Dangermond Preserve. This research explores decadal-scale behavior of the system using historical aerial imagery, digital surface models, and local wind observations that set context for an ongoing ecosystem restoration project to remove invasive species, enhance aeolian (windblown) processes, and re-establish native dune ecosystems.

Presentation 3: Inspiring Tomorrow's Leaders: Partnerships for Connecting Youth with Nature and Learning

Presenter: Diego Ortiz, Environmental Education Manager, TNC

Resources: ([presentation recording](#), [presentation slides](#))

This presentation highlighted the ways that TNC is working to design enriching curricula and programming for students to learn, both outside in nature and in classrooms, about California's biodiversity and strategies for climate resilience at the Dangermond Preserve and beyond.

Presentation 4: A Novel Approach for Assessing Ecohydrological Resilience to Water Stress in Dryland Ecosystems

Presenter: Bryn Morgan, UCSB

Resources: ([presentation recording](#), [presentation slides](#))

Successful adaptive conservation management strategies require an understanding of how species are responding to climate change and an ability to predict how fluctuating water resources will alter vegetation patterns and processes. This talk featured a novel, drone-based approach for measuring plant water use across gradients of moisture stress developed at the Dangermond Preserve and highlighted how this approach is facilitating insights into ecosystem resilience and response to climate change in dryland regions across the globe.

Presentation 5: Combining Long-Term Ecology and Environmental DNA to Study Coastal Species Range Dynamics Around Point Conception

Presenter: Mary McElroy, UCSB

Resources: ([presentation recording](#), [presentation slides](#))

Synthesis of rocky intertidal biodiversity surveys have allowed researchers to characterize how marine species ranges have shifted around Pt. Conception over the last two decades, but the resolution of long-term visual surveys limits our understanding of how climate change may promote or prevent range shifts across this major biogeographic boundary. Developing and integrating new monitoring tools based on environmental DNA can improve temporal coverage, enhance biodiversity detection, and support large-scale efforts to study climate effects on marine species ranges.

Afternoon Session: How Can the Dangermond Preserve Be a Platform for the Conservation Community?

Presentation 6: Connectivity Across Land and Sea: Uncovering the Unique Ecologies of Large Carnivores at the Dangermond Preserve

Presenter: Rae Wynn-Grant, PCI, UCSB, National Geographic

Resources: ([presentation recording](#), [presentation slides](#))

Globally, coastlines are among the most developed habitats in the world and have strong anthropogenic influence. The Dangermond Preserve's protected coastline provides an opportunity to understand the importance of coastal habitat for the persistence of large-bodied mammals like mountain lions to forage and move, thereby energetically connecting coastal and upland systems. This talk provided insights to the current work on understanding the role of land-sea protection and what it means for the conservation of wildlife in California.

Presentation 7: The Motus Wildlife Tracking Network: California's and the Dangermond Preserve's Role in Tracking Large-Scale Animal Movement Along the Pacific Coast.

Presenter: Rodd Kelsey, TNC

Resources: ([presentation recording](#), [presentation slides](#))

The Motus Wildlife Tracking network has grown substantially over the past five years, now enabling inexpensive tracking of small species movements (birds and insects) at a continental scale. Western North America has lagged behind in this growth, and an important opportunity exists to build out and improve upon this network of receiving stations across the Pacific Coast. This presentation highlighted the important role that the Dangermond Preserve and other preserves can play in expanding this network and putting the results to use in conservation.

Presentation 8: Science, Collaboration and Landscape-Scale Restoration at the Dangermond Preserve

Presenter: Laura Riege, Dangermond Preserve Restoration Manager, TNC

Resources: ([presentation recording](#), [presentation slides](#))

This presentation from TNC staff highlighted how PCI research and Dangermond Preserve restoration have worked in collaboration on key projects, including iceplant management, steelhead restoration, and oak restoration, to meet TNC's conservation goals and export new ideas to the wider conservation and restoration community.

Presentation 9: Dangermond Preserve: A Marine Biogeographic and Oceanographic Transition Point

Presenter: Peter Raimondi, UCSC

Resources: ([presentation recording](#), [presentation slides](#))

Thirty years of monitoring at Dangermond Preserve has revealed how oceanography and connectivity drives biogeography of nearshore marine communities along the west coast. This talk showed that the Point Conception and Government Point area is the boundary between relatively stable regions to the north and increasingly less stable and fragmented biogeographic regions to the south, which has implications for community resilience to climate change.

Panels

In addition to the nine presentations, the workshop also included a panel composed of a diverse set of disciplines and career levels, leveraging the themes of each session to further discussion between the audience and researchers.

The morning panel ([recording link](#)) focused on what makes the Dangermond Preserve unique, it was moderated by Dangermond Preserve Scientist Elizabeth Hiroyasu (TNC) and included five panelists:

- Zoe Zilz, UCSB Department of Ecology, Evolution, and Marine Biology
- Bryn Morgan, UCSB Department of Geography
- Frank Davis, UCSB Bren School of Environmental Science & Management
- Pete Raimondi, UCSC Department of Ecology and Evolutionary Biology
- Trisalyn Nelson, UCSB Department of Geography

The afternoon panel ([recording link](#)) focused on exploring how the Dangermond Preserve can be a platform for the conservation community. It was moderated by Trisalyn Nelson (UCSB Geography) and included five panelists:

- Ben Halpern, NCEAS
- Matthew Shapero, University of California Cooperative Extension
- Dawn Wright, Esri
- Dana Chadwick, NASA Jet Propulsion Laboratory
- Steven Gaines, UCSB Bren School of Environmental Science and Management

Resources Shared at the Symposium

- Interactive map of research projects ([link here](#); requires ArcGIS Online account)
- Maps of the preserve ([link](#))
- New website: www.dangermondpreserve.org

Concluding Comments

The symposium was designed to provide a space for engagement between researchers in response to the community's growing interest in research at Dangermond Preserve and PCI. During the panels, researchers highlighted a need to streamline research workflows and engagement as the PCI and Dangermond Preserve teams continue to grow. Great excitement was shown around the work Dangermond Preserve is developing in environmental education to support the next generation of conservation leaders. Overall, there was a buzz in the room as researchers reached out to one another to reconnect or to develop new connections as they enthusiastically discussed their work and cross-disciplinary collaboration opportunities during breaks.

The organizers hope that the online recordings and slides will help engage more of the research community in how they can continue to stay connected with PCI. It is clear there is appetite to continue engaging with the Dangermond Preserve and PCI, and organizers plan to host future symposia highlighting research findings and conservation outcomes. TNC staff have also developed centralized resources through our website, www.dangermondpreserve.org, to help potential collaborators better understand how to get involved in PCI research.