

2017 Natural Capital Symposium: Detailed Agenda

The Natural Capital Symposium runs a full program of sessions from Monday-Wednesday. Thursday has a more flexible schedule, which includes working groups, workshops, and additional training support time. The full program is split across three simultaneous tracks:

The **Pathways to Impact** track highlights engagements where an understanding of nature's benefits has had an impact on a decision, a stakeholder process, or an outcome. The panel sessions in this track focus on work that addresses a real policy window in collaboration with local stakeholders, where it can be demonstrated—or at least there is good reason to believe—that the ecosystem service information is, has, or will be used to inform decisions.

The **Learning Exchange** focuses on leading edge, experimental, and theoretical work that is advancing the science and practice of ecosystem services. The sessions in the Learning Exchange feature robust interchanges of creative ideas in a variety of formats, from poster sessions and lightning talks to round table discussions of lessons learned, software demonstrations, and panel discussions of the latest science and research at the farthest reaches of ecosystem service science.

The **Approaches & Applications** track has evolved from prior years' Training Track. It contains half-day workshops on key topics for practitioners and project teams who are looking to get their own natural capital-based projects underway, as well as more traditional conference sessions with presentations followed by opportunities for discussion. The workshop sessions are led by NatCap staff members and NatCap partners and collaborators. Additional training support is also available during the Open Support Hours on Thursday.

After the first section on Featured Speaker and Plenary Sessions, this document is organized by track. Please use the daily schedule to view sessions from each track that are running concurrently. Please use the daily schedule to see which sessions from each track are running concurrently.

Contents

Featured Speaker and Plenary Sessions	2
Pathways to Impact Track	5
Learning Exchange Track	8
Approaches & Applications Track	10
Workshops and Working Group Sessions	12



Featured Speaker and Plenary Sessions

Monday, March 20

8:30am – 9:30am

Paul Brest Hall

K1) Symposium Kick-off and Partnership Welcome

We will begin the Symposium by welcoming attendees from near and far. Gretchen Daily (Stanford), Steve Polasky (University of Minnesota), Jennifer Molnar (TNC), and Rebecca Shaw (WWF) will provide brief opening remarks.

9:30am – 10:45am

Paul Brest Hall

K2) What Role for Nature in the Transition Towards Livable Cities?

Resilient cities are key elements of a safe and healthy future for the planet. Last year, the UN adopted the New Urban Agenda, highlighting new ways for society to build, manage, and live in cities. As the public and private sectors devote increasing resources to building resilient cities, how can the ecosystem services community contribute to the effort? In this session, thought leaders in the space of urban development will share their experience and provide insights into the role of nature in the transition towards livable cities.

Speakers:

- Kiran Jain, Chief Resilience Officer, City of Oakland
- Tony Wong, Chief Executive, CRC for Water Sensitive Cities, Australia

Moderators:

- Lynn Scarlett, Global Managing Director for Public Policy, The Nature Conservancy
- Claire Bonham-Carter, Director of Sustainable Development, AECOM

11:15am – 12:45pm

Paul Brest Hall

K3) Sustainable Development

We are learning that countries need to consider natural capital at the highest level of development policy and planning because this is one of the most powerful levers for impact. National development policies and plans influence a country's long-term development trajectory, steering sectors like infrastructure, agriculture, and energy. For infrastructure alone, \$90 trillion of investment is estimated to be needed by 2030 to meet the Sustainable Development Goals and the economic ambitions of the world. Given this, the next 20 years are going to be decisive in determining the global trajectory. In this session, we will hear powerful regional models for this change globally. Representatives from The Bahamas, China, and Nepal will share inspirational stories of how senior political leaders and ministries of finance, economy, and planning are recognizing this need. We will hear their aspirations and achievements in considering natural capital in the development policies, plans, and priorities of their countries to achieve better outcomes for people and nature.

Speakers:

- Ugan Manandhar, Deputy Director, Climate Change, Freshwater and Energy, WWF-Nepal
- Nicola Virgill-Rolle, Director of Economic Development and Planning, Office of the Prime Minister, Bahamas
- Zhiyun Ouyang, Professor and Deputy Director of the Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, and Director of the State Key Laboratory of Urban and Regional Ecology,
- Kate Newman, Vice President for Public Sector Initiatives, WWF

Moderator: David McCauley, Senior Vice President, Policy and Government Affairs, WWF-US

2:00pm – 3:30pm

Paul Brest Hall

K4) Psychological Ecosystem Services: The mental health benefits of nature experience

The world is currently undergoing rates of urbanization that are unprecedented in human history. Concurrent with this trend is a marked decrease in the frequency of nature exposure for many urbanites. As humanity is increasingly concentrated in urban environments, it is necessary that we gain an empirical understanding of the human well-being repercussions resulting from this shift away from regular contact with natural environments. This session on mental health will be focused on the ways in which nature experience benefits various aspects of human cognitive function, mood, and emotion regulation. With this understanding, we can begin to envision the manner in which the psychological benefits of nature experience can be incorporated into the paradigm of ecosystem services. These results suggest that accessible natural areas may be a critical resource for mental health in our rapidly urbanizing world.

Speakers:

- Howard Frumkin, Professor, School of Public Health, University of Washington
- Jennifer Roe, Professor of Design and Health; Director of the Center for Design and Health, University of Virginia
- Matilda Van Den Bosch, School of Population and Public Health, University of British Columbia
- Greg Bratman, Center for Conservation Biology and Department of Psychology, Stanford University

Moderator: Greg Bratman

Tuesday, March 21

8:00am – 8:50am

Paul Brest East

K5) Coffeehouse Chat: “Opportunities and Barriers to Development Planning: Finance and Policy”

As we get warmed up and ready for the day’s sessions, special guests will take the stage for informal conversations about their work and visions for the future. As you arrive at the venue, pour yourself a cup of coffee or tea and start the day with some (caffeine and) inspiration!

Speakers:

- Mark Zimsky, Sr., Biodiversity Specialist, The Global Environmental Facility
- Nicola Virgill-Rolle, Government Lead, National Development Plan, and Director of National Development and Planning, Office of the Prime Minister, The Bahamas

Moderator: David McCauley, Senior Vice President for Policy and Government Affairs, WWF-US

1:30pm – 3:00pm

Paul Brest Hall

K6) Scaling Natural Capital Approaches

This session will feature 3 very different ways in which natural capital approaches are transforming decisions at breathtaking scales. We will hear about how (i) national-scale development planning in China is changing policies and investments designed to safeguard human well-being; (ii) nature-based watershed payment schemes are spreading rapidly around the world; and (iii) NatCap’s open-source data and software platform is making analyses of natural capital values faster and easier. After short presentations by each speaker, Mary Ruckelshaus will moderate an open discussion with the audience about the opportunities and challenges facing our community of practice in the urgent need to scale uptake of natural capital information.

Speakers:

- Zhiyun Ouyang, Professor and Deputy Director of the Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, and Director of the State Key Laboratory of Urban and Regional Ecology; and Ma Qiang, Deputy Director, Department of Development Planning, National Development and Reform Commission
- Silvia Benítez, Freshwater Manager, Water Security Team Latin America, The Nature Conservancy
- Rich Sharp, Chief Software Architect, Natural Capital Project

Moderator: Mary Ruckelshaus, Managing Director, Natural Capital Project

3:30pm – 4:30pm

Paul Brest Hall

K7) Keynote: Carter Roberts

Keynote address from Carter Roberts, President and CEO, World Wildlife Fund

4:30pm – 5:30pm

Rehnquist Courtyard

K7) Reception for Carter Roberts

Please join us for drinks and light snacks in honor of our keynote speaker

7:30pm

Bing Concert Hall

Special evening event: The Head & the Heart

You are warmly invited to an evening celebrating the intimate connections between people and nature. A special program featuring photography and music (doors close promptly at 7:30) will be followed by an exhibit featuring photographs and maps from a few of the places where NatCap and partners are working together towards a more livable planet for all species. Dessert and drinks will be served.

Wednesday, March 22

8:00am – 8:50am

Paul Brest East

K8) Coffeehouse Chat: “Natural Capital Stories from Around the World”

Without solid facts and data, the natural capital movement won't grow. But without stories, nobody will listen to the facts and data. Stories draw people in so they are inspired enough about an issue to care about the science behind it. Come hear five people within the movement, from as far away as Nepal and as close as the United States, tell stories about their experiences in the field—and hopefully inspire you to think about what stories you can tell to advance your natural capital project when you get home.

Storytellers:

- Hua Zheng, State Key Lab of Urban and Regional Ecology Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences
- Hilary Papendick, Climate Change Program Manager, San Mateo County, Office of Sustainability
- Nicola Virgill-Rolle, Director of Economic Development and Planning, Office of the Prime Minister, Bahamas
- Eoin Sinnott, Director, Valuing Nature Initiative, WWF-US
- Ugan Manandhar, Deputy Director, Climate Change, Freshwater and Energy, WWF-Nepal

Moderator: Jill Schwartz, Senior Director, Communications, WWF

4:00pm – 5:00pm

Paul Brest Hall

K9) Keynote: Mark Tercek

Keynote address from Mark Tercek, President and CEO, The Nature Conservancy, entitled: “What Conservation Needs from Science”

5:00pm – 5:10pm

Paul Brest Hall

Reflections

Natural Capital Project leadership reflects on the past three days of our gathering and looks forward to working groups and other events tomorrow and beyond.

5:10pm – 6:30pm

Rehnquist Courtyard

Reception for Mark Tercek

Please join us for drinks and light snacks in honor of our keynote speaker.

Pathways to Impact Track

Monday, March 20

4:00pm – 5:30pm

Paul Brest East

P1) Fostering Resilient Coastal Communities

Expanding coastal development, rising seas, and the potential for increasing intensity and frequency of storms pose risk to coastal communities and infrastructure. The practice of using natural and nature-based approaches to enhance coastal resilience is growing and offers the opportunity to share lessons and insights from on-going work around the world and to identify new science and avenues for future efforts. This session features four panelists that will share their experiences and research incorporating protection provided by ecosystems into coastal risk reduction planning. Joining us from a variety of institutions including NGOs, government and academia, the speakers will share a wide range of perspectives and interests. Presentations will be followed by questions for the panel and discussion with the audience.

Speakers:

- Todd Bridges, Senior Research Scientist at US Army Engineer Research and Development Center, US Army Corps of Engineers
- Michael Beck, Lead Scientist, The Nature Conservancy and Adjunct Professor in Ocean Sciences, University of California-Santa Cruz
- Gabrielle Wong-Parodi, Assistant Research Professor, Carnegie Mellon University
- Katie Arkema, Lead Scientist, Natural Capital Project

Tuesday, March 21

9:00am – 10:30am

Paul Brest East

P2) Securing Freshwater Through Innovative Public and Private Partnerships

This session will showcase examples of innovative mechanisms for securing freshwater, through partnerships between public and private institutions, development banks, and civil society. Following presentation of example cases, there will be a panel discussion on the lessons learned, opportunities and potential co-benefits for using water as a way to convene many different interests around land and resource management, climate change, and ecosystem-based adaptation.

Speakers:

- Andrea Erickson, Managing Director Water Funds and Water Markets, The Nature Conservancy
- Suzanne Ozment, Associate, Global Water Program World Resources Institute
- Byron Swift, President, Nature and Culture International
- Lindsay Bass, Manager, Corporate Water Stewardship, WWF

Moderator: Adrian Vogl, Senior Scientist, Natural Capital Project

11:00am – 12:30pm

Paul Brest East

P3) Community Dependence on Ecosystems: It's all about the people

Natural capital approaches to investment and development decisions promise to reveal human dependence on nature by mapping and quantifying the benefits of ecosystems to people. Yet much of the current science and practices fall short of this promise by failing to translate biophysical changes to effects on human communities. When beneficiaries and their demand for services are not explicitly incorporated into decisions, we risk compromising those streams of benefits and hamper progress towards sustainable development. Panelists will share their research and experiences connecting the dots between ecosystems and people to inform climate adaptation, management of fisheries and fisheries dependent livelihoods, health and water quality. In particular we will explore approaches for quantifying community dependence on ecosystems and for evaluating the outcomes of health, conservation, and economic policies.

Speakers:

- Seema Jayachandran, Department of Economics, Northwestern University and The Abdul Latif Jameel Poverty Action Lab, Massachusetts Institute for Technology
- Cathy Kling, Department of Economics, Iowa State University
- Taylor Ricketts, Gund Institute for Ecological Economics, University of Vermont, and Co-Founder of the Natural Capital Project
- Carter Brandon, Global Lead Economist, Environment and Natural Resources Global Practice, The World Bank

Moderator: Steve Polasky, Department of Applied Economics, University of Minnesota, and Co-Founder of the Natural Capital Project

Wednesday, March 22

9:00am – 10:30am

Paul Brest East

P4) Case Studies in Pathways to Impact Across Various Scales

This session features case studies where information about ecosystem services has been used in a policy or planning process. These cases cover a multitude of services and decision contexts, and sample from a broad array of geographic scales, from an individual company campus to an international community of nations.

Speakers:

- Jorge Leon Sarmiento, Latin America Water Funds Specialist, The Nature Conservancy
- Kate Malmgren, [e]Team Design and Construction Integrator, and Sari Ancel, Ecology Program Project Manager, Google
- Rachel Neugarten, Senior Manager of Conservation Priority Setting, Conservation International
- James Vause, Lead Economist, UNEP-World Conservation Monitoring Centre
- AVECITA Chicchón, Director of Andes-Amazon Initiative, Gordon and Betty Moore Foundation

Moderator: Rob Griffin, Economist, Natural Capital Project

11:00am – 12:30pm

Paul Brest East

P5) Climate Change

The latest trends in climate change indicate even greater pressures on human and natural systems from shifts in temperature, rainfall, and hazards such as coastal storms, fires, and disease outbreaks. How to include climate trends and uncertainty in cumulative climate impacts on sustainable development strategies is an area of active research and practice. Panel members will outline both challenges and opportunities in applying a climate change perspective to efforts aimed at harmonizing conservation and human development objectives. Moderator Chris Field will stimulate a lively discussion about what is next for climate science, and best practices for including rapidly changing information into policies and investments affecting ecosystem and human wellbeing.

Speakers:

- Chris Field, Perry L. McCarty Director, Stanford Woods Institute for the Environment,
- Rebecca Shaw, Chief Scientist and Senior Vice President, WWF-US,
- Lee Hannah, Senior Research Fellow, Conservation International
- Katie Arkema, Lead Scientist, Natural Capital Project

Moderator: Chris Field, Perry L. McCarty Director, Stanford Woods Institute for the Environment

2:00pm – 3:30pm

Paul Brest East

P6) Private Financing for Sustainable Development

Sustainable development plans are just plans until they are funded and delivered. While attention is rightly focused on the role of policy and governance in fostering sustainable development, the private sector is uniquely positioned to respond to the significant needs of the Sustainable Development Goals (SDGs) and has been showing interest in engaging in this agenda. For infrastructure alone, it is estimated that \$90 trillion of investment is needed by 2030. Leading financial institutions are improving their understanding of the risks of ecosystem degradation to their bottom lines and implications for risk-return profiles. Some are starting to make bold commitments to promote fair and sustainable development. But to drive investments in sustainable land use and management practices at scale, the private sector needs both greater incentives and practical approaches for integrating natural capital and human well-being metrics into investment decision-making. Furthermore, there are also new opportunities for leading financial institutions who recognize and properly integrate natural capital. In this session, we will discuss how natural capital approaches can help to achieve long-term sustainable returns and contribute toward sustainable development.

Speakers:

- Elizabeth White, Chief Strategist, Risk and Sustainability, International Finance Corporation, World Bank Group
- Andrew Collins, Technical Director, ESG Standards Setting, Sustainable Accounting Standards Board
- Spencer Wood, Senior Scientist, Natural Capital Project
- Zach Knight, Co-Founder and Partner, Blue Forest Conservation
- Eric Letsinger, Founder, Quantified Ventures

Moderator: Ray Dhirani, Head of Sustainable Finance and Extractives, WWF-UK

Learning Exchange Track

Monday, March 20

4:00pm – 5:30pm

Paul Brest West

L1) Lightning Talks

This session provides a venue for researchers and practitioners to learn about and share diverse experiences and work with natural capital approaches. The session will consist of several short presentations followed by small group breakout discussions.

Speakers:

- Miguel Bugalho, Principal Investigator, WWF MedPO and University of Lisbon
- Benis Egho, Principal Researcher in Biodiversity and Ecosystem Services, Council for Scientific and Industrial Research
- Marina Garcia-Llorente, PhD researcher, Madrid Institute for Rural Development Agricultural and Food Research (IMIDRA)
- Eugene Itua, Director, Natural Eco Capital
- Jinlong Liu, PhD Candidate, The University of Melbourne
- Jen Molnar, Managing Director and Lead Scientist, The Nature Conservancy
- Fanglin Sun, Ph.D. Candidate, University of California, San Diego

Tuesday, March 21

9:00am – 10:30am

Paul Brest West

L2) Promoting Urban Climate Resilience

The San Francisco Bay Area is the fourth largest metropolitan area in the United States, with a significant number of its more than 7.4 million people, critical assets, and infrastructure located along the shoreline. The anticipation of rising tides due to climate change is catalyzing extensive planning efforts in the Bay to reach across jurisdictions and sectors and focus on building regional resilience. As part of this effort, decision-makers in the Bay are exploring where investing in natural infrastructure and restoration efforts may be effective long-term adaptation strategies. This session will feature several short talks from practitioners and scientists working on building resilience and adapting to rising sea levels in the Bay Area. Following the talks, an open, roundtable discussion will give participants the opportunity to ask questions and share experience from their own region.

Speakers:

- Matt Gerhart, Program Manager for the San Francisco Bay Conservancy program of the State of California Coastal Conservancy
- Hilary Papendick, Climate Resiliency Specialist, County of San Mateo Office of Sustainability
- Lindy Lowe, Chief Planning Officer, San Francisco Bay Conservation and Development Commission
- Mark Stacey, Professor of Civil and Environmental Engineering at UC Berkeley
- Warner Chabot, Executive Director, San Francisco Estuary Institute & The Aquatic Science Center
- Sam Veloz, Climate Adaptation Group Director, Point Blue

Moderator: Anne Guerry, Chief Strategy Officer and Lead Scientist, Natural Capital Project

11:00am – 12:30pm

Jacobson-Sorensen Hall Room 123

L3) Biodiversity

Biodiversity is complex; it encompasses everything from genes to ecosystems, spans spatial scales from a soil aggregate to the globe, and is constantly changing through time. In an attempt to tackle the enormous challenge that is describing the variety of life on planet earth, biodiversity scientists have drawn from classical ecology and natural history, molecular biology, remote sensing, mathematics, physics, and biogeochemistry. Each discipline has created a plethora of methods, measurements, and metrics in pursuit of quantifying current patterns and projecting future threats to biodiversity. In doing so, we've uncovered and characterized much of the nuance of the particular type of diversity in a given system. The challenge now is how to best integrate measurements of oft-disparate metrics of biodiversity alongside ecosystem service evaluations to meet specific policy aims. This session will cover ways to best target future biodiversity research to meet regional and global policy aims from both a pure biodiversity standpoint and the biodiversity-moderated ecosystem services perspective.

Speakers:

- Henrique Pereira, Professor of Biodiversity Conservation, German Center for Integrative Biology Research (iDiv), Chair of the Group on Earth Observations Biodiversity Observation Network (GEO BON)
- Daniel Karp, Assistant Professor, University of California Davis
- Silvia Ceașu, PhD Candidate in Biodiversity Conservation, German Center for Integrative Biology Research (iDiv)
- Jon Flanders, University of Bristol, UK, and Visiting Scholar, Stanford Center for Conservation Biology

Wednesday, March 22

9:00am – 10:30am

Paul Brest West

L4) Implementing InVEST in New Contexts

InVEST is used to assess ecosystem services in a range of contexts around the world. This session's presenters will share experiences of how they have used InVEST to model species habitat, assess cultural ecosystem services, engage multiple stakeholders in scenario simulations, and incorporate wave energy models in marine planning. These studies cover a variety of ecosystems (e.g., grasslands, forests, oceans) in North America, Southeast Asia, and the Amazon.

Speakers:

- Cali Roth, Geospatial Analyst, US Geological Survey
- Yoonjung Kim, Researcher, Korea Environment Institute
- Blake E. Feist, Landscape Ecologist, US National Oceanic and Atmospheric Administration
- Nirmal Bhagabati, Lead for Natural Capital Science and Forests, and Michele Dailey, Natural Capital Analyst, WWF-US

11:00am – 12:30pm

Paul Brest West

L5) New Frontiers: Methods, models, and tools

Practitioners in the ecosystem services community continue to innovate to find new ways to model, display, and otherwise improve the modeling of services—all with the goal of helping stakeholders incorporate nature's value into decision making. This session will include five talks covering recent advances in diverse modeling-related areas of optimization, visualization, large-scale data analysis, web-based workflows, and integrated modeling of socio-environmental systems.

Speakers:

- Toby Roxburgh, Economics Adviser, WWF-UK
- Martin Lacayo, PhD Candidate, University of Geneva
- Heera Lee, PhD Candidate, University of Bonn
- Benjamin Bryant, Natural Capital Project

2:00pm – 3:30pm

Jacobson-Sorensen Hall Room 123

L6) Scenarios and Stakeholder Engagement

Scenarios are plausible stories about how the future of a social-ecological system might unfold. Scenario planning can be an important tool for transformation because it forces people to think explicitly about alternative situations, consider key uncertainties and create an understanding that a different order of things is possible. We will bring together leading scholars from diverse disciplines to create a novel overview of the multiple roles scenarios can have in social-ecological transformations.

Speakers:

- Steve Polasky, Department of Applied Economics, University of Minnesota, and Co-Founder of the Natural Capital Project
- Anne Guerry, Chief Strategy Officer and Lead Scientist, Natural Capital Project
- Garry Peterson, Professor, Stockholm Resilience Center
- Albert Norström, Executive Director, Program on Ecosystem Change and Society (PECS), and Researcher, Stockholm Resilience Center

Approaches & Applications Track

Monday, March 20

2:00pm – 5:30pm

School of Education Room 128

A1) Getting Started with a Natural Capital Approach

This session is intended for those who are new to taking a natural capital approach to informing decisions. It will begin with a preview of our training offerings and guidance on navigating the Approaches & Applications and Learning Exchange tracks at this year's Symposium. We will also highlight the importance of early project scoping to help frame appropriate scientific and management questions, improve the quality of analytical outputs, and increase the likelihood that results are salient and accessible to stakeholders and policymakers. This session will also introduce NatCap's primary software suite, InVEST, and walk through typical workflows, and give an overview of the various models available within it. Bring your laptop if you'd like help installing InVEST, RIOS, OPAL, or QGIS software.

Tuesday, March 21

9:00am – 10:30am

Jacobson-Sorensen Hall Room 123

A2) Scenario-based Decision Making for Sustainable Development

This session will explore scenario approaches, tools, and case studies that have potential to support sustainable development planning at national and sub-national scales by governments, communities, and other stakeholders. Building on case studies, the session will introduce scenarios and relevant scenario tools, exploring their proven or potential utility and explore their strengths and weaknesses in the contexts of sustainable development planning.

11:00am – 12:30pm

Paul Brest West

A3) Integrating Ecosystem Services, Beneficiaries and Social Indicators into Forest Landscape Restoration with the Restoration Opportunities Assessment Methodology (ROAM)

Forest landscape restoration offers opportunities to enhance ecosystems, reduce risks from disasters, and improve health and livelihoods. An approach that accounts for ecosystem services can help address persistent challenges in implementing restoration by increasing political will for restoration, illuminating trade-offs among different restoration objectives (e.g. carbon sequestration, biodiversity, water security, food security, and social objectives like gender equality), and lead to more strategic investments. IUCN and the Natural Capital Project have partnered to develop the Restoration Opportunities Optimization Tool (ROOT) as well as guidance for more explicitly integrating ecosystem services into the Restoration Opportunities Assessment Methodology (ROAM), a process that is ongoing in at least two dozen countries in Africa, Asia, and Latin America. Here we present case studies, innovative open-source software tools, and lessons learned from integrating these approaches in our collaborative projects.

Speakers:

- Craig Beatty, International Union for the Conservation of Nature (IUCN)
- Adrian Vogl, Senior Scientist, Natural Capital Project, Stanford University
- Leander Raes, IUCN Regional Office for Mexico, Central America, and the Caribbean
- Peter Hawthorne, Ecologist, Natural Capital Project, University of Minnesota

Wednesday, March 22

9:00am – 12:30pm

Jacobson-Sorensen Hall Room 123

A4a) Hands-on with InVEST for Coastal Resilience

Ecosystems play a crucial role in supporting livelihoods in coastal communities and minimizing a community's risk to coastal hazards. Competing needs for development can threaten those ecosystems. During this session we will work with a suite of InVEST models that address these trade-offs and highlight the role of healthy ecosystems. The Habitat Risk Assessment model maps impacts of human activities on ecosystems. In turn, the Coastal Vulnerability model measures how change in ecosystems lead to change in ability to reduce risks from coastal hazards. And the Recreation and Tourism model explores values of coastal ecosystems in their ability to provide recreation opportunities and support livelihoods in the tourism industry. The goal of this session is to introduce the scientific underpinnings of these models, discuss different contexts in which to apply them, and build familiarity with running and interpreting results from InVEST models. We will use exercises designed to illustrate how real-world planning decisions can be informed with quantitative model results. We will also explore the basic structure of InVEST models in general and learn about the InVEST file structure, the user interface, and types of model inputs and outputs.

Featured Speaker:

- Eddy Silva, Oceans and Coasts National Program Coordinator, WWF Ecuador

9:00am – 12:30pm

School of Education Room 313

A4b) Hands-on with the InVEST Hydrology Suite

Whether you have a background in hydrology or are simply interested in how natural ecosystems provide freshwater services, this session is for you! We will present an overview of the four freshwater models that are part of the InVEST suite, with examples of recent applications by NatCap and partners. The second part of the session will be dedicated to hands-on activities, focused on one or two of our most recent models (nutrient retention and seasonal water yield). Participants will have a chance to run the models on their laptops and share lessons and best practices for the application of InVEST models.

Featured Speaker:

- Kim Falinski, Marine Applied Scientist, The Nature Conservancy - Hawaii

2:00pm – 3:30pm

Paul Brest West

A5) New Frontiers: Communication and Capacity

This session features talks on communication about the value of nature and the social contexts surrounding ecosystem service decision-making. The approaches include immersive computer-based education, games that illuminate constraints and opportunities in a social context, how to reconcile storytelling and science to burst confirmation bias, and lessons for overcoming barriers in international cross-disciplinary work.

Speakers:

- Tim Kelly, Co-founder and Chief Executive Officer, Planet3
- Clément Feger, Research Associate, University of Cambridge
- Nathanael Johnson, Senior Writer, Grist
- Charlotte Weil, École Polytechnique Fédérale de Lausanne and Natural Capital Project

Workshops and Working Group Sessions

***We request that you please RSVP for sessions you plan to attend on Thursday, via links available with these session descriptions on the Symposium website.**

Thursday, March 23

9:00am – 11:00am

Paul Brest West

W1) Roundtable: Sustainable Development Planning

With the adoption of the 2030 Agenda for Sustainable Development and inspiration from a growing number of practical examples, governments and financial institutions are increasingly expressing interest in incorporating natural capital and ecosystem services into their decision-making processes, in order to more comprehensively account for the costs and benefits of development options. In this Roundtable session, we will take stock of progress made and remaining gaps in developing the approaches, information, and incentives needed to make sustainable development planning commonplace. We will start with a series of lightning talks, drawing on speakers' experiences from around the globe and covering multiple dimensions of sustainable development planning — from policy to finance mechanisms to analytical tools. Lightning talks will be followed by discussion among presenters and audience members. Together, we will aim to identify opportunities and solutions to common obstacles faced in creating and implementing development plans that account for nature's values.

Speakers:

- Johannes Förster, Helmholtz-Centre for Environmental Research
- Natasha Tang Kai, University of Waterloo, Canada
- Roland Eve & Tiana Ramahaleo, WWF Madagascar
- Pallab Mozumder, Florida International University
- Toni Anderson, Silvacon
- Joseph William Bull, University of Copenhagen

9:00 am – 12:30 am

Jacobson-Sorensen Hall Room 123

W2) Workshop: Using Economic Valuation and Choice Experiments to Impact Policy

This half-day training session will focus on environmental valuation and how it can be used to impact policy. The first morning session will present an overview of environmental valuation and strategic approaches to framing a valuation study. Several methods to estimate ecosystem service values will be presented, along with practical examples from the field. The second morning session will focus on using the choice experiment valuation method to better understand how people make decisions and respond to incentives. This session will include models of human behavior, an overview of the choice experiment method, and a case study example from Ecuador on designing incentive programs for mangrove conservation.

Instructor: Kim Bonine, Training Director, Conservation Strategy Fund (CSF)

Schedule

Part I

1. Valuation – what is it and why do it
2. Economic values classification
3. Valuation methods overview
 1. Direct market, production function, revealed, stated, benefits transfer

— Coffee break —

Part II

1. Understanding human behavior and incentives
 1. Economic framework for modeling decisions
 2. Chocolate exercise
2. Choice experiments
 1. Overview
 2. Socio Bosque case study in Ecuador
3. Additional resources

9:00am – 12:30pm

Shriram Hall Room 262

W3) Working Group: Scenarios

Scenarios are plausible stories about how the future might unfold. They begin discussions about people's visions for the future and help articulate what it is that they care about. Forced to get specific about envisioning the future, people must think explicitly about alternative situations, consider key uncertainties, and create an understanding that a different order of things is possible. This kind of thinking can lead to transformations in social-ecological systems. With funding from the Marcus and Marianne Wallenberg Foundation, a group of us from Stanford and the Stockholm Resilience Center are exploring our different thought-processes about and real-world experience in using scenarios in decision-making, and working together to chart a course forward. But we don't want to be in an echo chamber. If you have used scenario planning in your work or are interested in how scenarios can lead to transformation, please come join us, share your ideas, and help us shape the future.

9:00am – 3:00pm

Jacobson-Sorensen Hall Room 142

W4) Workshop: Python programming for ecosystem services and InVEST

Behind InVEST’s user interface is a mature Python extension/API that can be used to automate all InVEST models chain a pipeline of model runs, seamlessly pre- and post-process data and results and more! This is an all-day session, open to all, focusing on installing Python and the InVEST extensions, moving toward scripting a single InVEST model run, advancing to automating many InVEST runs on directories of data, and advanced topics such as automatic aggregation of results, parallel processing, and more. This is the first time we’ve offered a specific technical session, so we’re willing to work with anyone who is interested. Attendees are welcome to join in the middle of a session and leave early. It will be helpful to have some specific (even if very basic) knowledge of Python scripting to those who are comfortable with “pip install natcap.invest”. Additionally, a strong opinion of best Star Trek captain and/or favorite Kerbal crew are encouraged but not required.

Instructors: Rich Sharp, Software Architect, Natural Capital Project, and James Douglass, Software Lead, Natural Capital Project

1:30pm – 3:00pm

Jacobson-Sorensen Hall Room 123

W5) Workshop: The InVEST Recreation Model

Recreation and tourism are important components of economies and they contribute in many ways to quality of life. To quantify the recreational value of natural environments, the InVEST recreation model predicts the distribution of person-days of recreation, based on the locations of natural and cultural features of the landscape. This session will discuss approaches to mapping recreational use and a technique using geotagged photographs as a measure of visitation. We will demonstrate methods for preparing input data, developing scenarios, and interpreting results, using our latest research as examples. Finally, we will discuss new developments and future directions for the InVEST recreation model. Participants will have the opportunity to get feedback on their own projects.

Instructor: Dave Fisher, Ecosystem Services Analyst, Natural Capital Project

9:00am – 3:00pm

Paul Brest East

W6) NatCap Open Support Hours

Various members of the Natural Capital Project team will be available throughout the day on Thursday or one-on-one and/or small-group help, advice, or friendly conversation on a variety of subjects. We will also be playing one of NatCap’s ecosystem service trade-off games during one hour of this time. A more detailed schedule of what topics will be covered during which hours will be shared online. Please check the website for more details.

Alphabetical Index of Speakers

First Name	Last Name	Session	Date & Time	Location
Sari	Ancel	P4	3/22, 9:00am-10:30am	Paul Brest East
Toni	Anderson	W1	3/23, 9:00am-11:00am	Paul Brest West
Katie	Arkema	P1, P5	multiple	multiple
Lindsay	Bass	P2	3/21, 9:00am-10:30am	Paul Brest East
Craig	Beatty	A3	3/21, 11:00am-12:30pm	Paul Brest West
Michael	Beck	P1	3/20, 4:00pm-5:30pm	Paul Brest East
Silvia	Benitez	K6	3/21, 1:30pm-3:00pm	Paul Brest Hall
Nirmal	Bhagabati	L4	3/22, 9:00am-10:30am	Paul Brest West
Claire	Bonham-Carter	K2	3/20, 9:30-10:30	Paul Brest Hall

Carter	Brandon	P3	3/21, 11:00am-12:30pm	Paul Brest East
Greg	Bratman	K4	3/20, 2:00pm-3:30pm	Paul Brest Hall
Todd	Bridges	P1	3/20, 4:00pm-5:30pm	Paul Brest East
Benjamin	Bryant	L5	3/22, 11:00am-12:30pm	Paul Brest West
Miguel	Bugalho	L1	3/20, 4:00pm-5:30pm	Paul Brest West
Joseph William	Bull	W1	3/23, 9:00am-11:00am	Paul Brest West
Silvia	Ceaşu	L3	3/21, 11:00am-12:30pm	J-S Classroom 123
Warner	Chabot	L2	3/21, 9:00am-10:30am	Paul Brest West
Avecita	Chicchón	P4	3/22, 9:00am-10:30am	Paul Brest East
Andrew	Collins	P6	3/22, 2:00pm-3:30pm	Paul Brest Hall
Michele	Dailey	L4	3/22, 9:00am-10:30am	Paul Brest West
Gretchen	Daily	K1	3/20, 9:00am-9:20am	Paul Brest Hall
Ray	Dhirani	P6	3/22, 2:00pm-3:30pm	Paul Brest Hall
Benis	Egoh	L1	3/20, 4:00pm-5:30pm	Paul Brest West
Andrea	Erikson	P2	3/21, 9:00am-10:30am	Paul Brest East
Roland	Eve	W1	3/23, 9:00am-11:00am	Paul Brest West
Kim	Falinski	A4a	3/22, 9:00am-12:30pm	Education 313
Clément	Feger	A5	3/22, 2:00pm-3:30pm	Paul Brest West
Blake E.	Feist	L4	3/22, 9:00am-10:30am	Paul Brest West
Chris	Field	P5	3/22, 11:00am-12:30pm	Paul Brest East
Jon	Flanders	L3	3/21, 11:00am-12:30pm	J-S Classroom 123
Johannes	Förster	W1	3/23, 9:00am-11:00am	Paul Brest West
Howie	Frumkin	K4	3/20, 2:00pm-3:30pm	Paul Brest Hall
Marina	Garcia-Llorente	L1	3/20, 4:00pm-5:30pm	Paul Brest West
Matt	Gerhart	L2	3/21, 9:00am-10:30am	Paul Brest West
Anne	Gerry	L6	3/22, 2:00pm-3:30pm	J-S Classroom 123
Lee	Hannah	P5	3/22, 11:00am-12:30pm	Paul Brest East
Peter	Hawthorne	A3	3/21, 11:00am-12:30pm	Paul Brest West
Eugene	Itua	L1	3/20, 4:00pm-5:30pm	Paul Brest West
Kiran	Jain	K2	3/20, 9:30-10:30	Paul Brest Hall
Seema	Jayachandran	P3	3/21, 11:00am-12:30pm	Paul Brest East
Nathanael	Johnson	A5	3/22, 2:00pm-3:30pm	Paul Brest West
Daniel	Karp	L3	3/21, 11:00am-12:30pm	J-S Classroom 123
Yoonjung	Kim	L4	3/22, 9:00am-10:30am	Paul Brest West
Cathy	Kling	P3	3/21, 11:00am-12:30pm	Paul Brest East
Zach	Knight	P6	3/22, 2:00pm-3:30pm	Paul Brest Hall
Martin	Lacayo	L5	3/22, 11:00am-12:30pm	Paul Brest West
Heera	Lee	L5	3/22, 11:00am-12:30pm	Paul Brest West
Jorge	Leon Sarmiento	P4	3/22, 9:00am-10:30am	Paul Brest East
Eric	Letsinger	P6	3/22, 2:00pm-3:30pm	Paul Brest Hall
Jinlong	Liu	L1	3/20, 4:00pm-5:30pm	Paul Brest West
Lindy	Lowe	L2	3/21, 9:00am-10:30am	Paul Brest West
Kate	Malmgren	P4	3/22, 9:00am-10:30am	Paul Brest East
Ugan	Manandhar	K3, K8	multiple	multiple
David	McCauley	K3, K5	multiple	multiple

Jennifer	Molnar	K1, L1	multiple	multiple
Pallab	Mozumder	W1	3/23, 9:00am-11:00am	Paul Brest West
Rachel	Neugarten	P4	3/22, 9:00am-10:30am	Paul Brest East
Kate	Newman	K3	3/20, 11:00am-12:30pm	Paul Brest Hall
Albert	Nordström	L6	3/22, 2:00pm-3:30pm	J-S Classroom 123
Zhiyun	Ouyang	K3, K6	multiple	multiple
Suzanne	Ozment	P2	3/21, 9:00am-10:30am	Paul Brest East
Hilary	Papendick	K8, L2	multiple	multiple
Henrique	Pereira	L3	3/21, 11:00am-12:30pm	J-S Classroom 123
Garry	Peterson	L6	3/22, 2:00pm-3:30pm	J-S Classroom 123
Steve	Polasky	K1, L6, P3	multiple	multiple
Ma	Qiang	K6	3/21, 1:30pm-3:00pm	Paul Brest Hall
Leander	Raes	A3	3/21, 11:00am-12:30pm	Paul Brest West
Tiana	Ramahaleo	W1	3/23, 9:00am-11:00am	Paul Brest West
Taylor	Ricketts	P3	3/21, 11:00am-12:30pm	Paul Brest East
Carter	Roberts	K7	3/21, 3:30-4:30	Paul Brest Hall
Jennifer	Roe	K4	3/20, 2:00pm-3:30pm	Paul Brest Hall
Cali	Roth	L4	3/22, 9:00am-10:30am	Paul Brest West
Toby	Roxburgh	L5	3/22, 11:00am-12:30pm	Paul Brest West
Lynn	Scarlett	K2	3/20, 9:30-10:30	Paul Brest Hall
Jill	Schwartz	K8	3/22, 8-8:50	Paul Brest East
Rich	Sharp	K6	3/21, 1:30pm-3:00pm	Paul Brest Hall
Rebecca	Shaw	K1, P5	multiple	multiple
Eddy	Silva	A4b	3/22, 9:00am-12:30pm	J-S Classroom 123
Eoin	Sinnott	K8	3/22, 8-8:50	Paul Brest East
Mark	Stacey	L2	3/21, 9:00am-10:30am	Paul Brest West
Fanglin	Sun	L1	3/20, 4:00pm-5:30pm	Paul Brest West
Byron	Swift	P2	3/21, 9:00am-10:30am	Paul Brest East
Natasha	Tang Kai	W1	3/23, 9:00am-11:00am	Paul Brest West
Mark	Tercek	K9	3/22, 4-5 pm	Paul Brest Hall
Matilda	van den Bosch	K4	3/20, 2:00pm-3:30pm	Paul Brest Hall
James	Vause	P4	3/22, 9:00am-10:30am	Paul Brest East
Sam	Veloz	L2	3/21, 9:00am-10:30am	Paul Brest West
Kari	Vigerstol	P2	3/21, 9:00am-10:30am	Paul Brest East
Nicola	Virgill-Rolle	K3, K5, K8	multiple	multiple
Adrian	Vogl	A3	3/21, 11:00am-12:30pm	Paul Brest West
Charlotte	Weil	A5	3/22, 2:00pm-3:30pm	Paul Brest West
Elizabeth	White	P6	3/22, 2:00pm-3:30pm	Paul Brest Hall
Tony	Wong	K2	3/20, 9:30-10:30	Paul Brest Hall
Gabrielle	Wong-Parodi	P1	3/20, 4:00pm-5:30pm	Paul Brest East
Spencer	Wood	P6	3/22, 2:00pm-3:30pm	Paul Brest Hall
Hua	Zheng	K8	3/22, 8-8:50	Paul Brest East
Mark	Zimsky	K5	3/21, 8:15-8:45	Paul Brest East