

**Adapting to Climate Change: A Training for Coastal and Marine Resource Managers
DETAIL AGENDA**

DAY 1

Goals:

Understand the need and motivations for planning for and addressing climate change impacts, as well as the enabling policy environment for adaptation. Ensure that participants have a solid understanding of potential climate change impacts to marine and coastal resources in Northern California, and how to utilize climate change science to better understand the specific impacts to their management areas.

Core Trainers:

Anne Walton, Meg Caldwell, Tim Doherty

Guest Speakers:

Sara Polgar (BCDC), Guido Franco (CEC), Ellie Cohen (PRBO)

TIME	SUBJECT	LEAD
8:00-8:30	REGISTRATION: Coffee and Light Breakfast	
8:30-9:30	WELCOME AND INTRODUCTIONS: 1) Timeline Exercise 2) Set training rules/guidelines collectively 3) Form groups	Anne Walton (NOAA)
9:30-9:45	COURSE OVERVIEW: 1) What to expect, 2) Goals 3) Logistics	Anne Walton (NOAA)
9:45-10:00	PRESENTATION: Why should public trust managers be concerned about climate change? <ul style="list-style-type: none"> • Importance of planning now for the uncertainties of climate change in the future • What does this mean for resource managers? • What does the training model look like? • What will we end up with at the conclusion of this training? 	Anne Walton (NOAA)
10:00-10:15	EXERCISE: Challenges to addressing climate change 1) Each team identifies and discusses challenges. 2) Group report-outs. <i>Objective: Articulate coastal resource managers' motivation for proactive planning and adaptation, while acknowledging the challenges and costs of taking these actions.</i>	
10:15-10:30	PRESENTATION: What's happening at the global scale? <ul style="list-style-type: none"> • What's the take home message from Copenhagen for coastal and local governments? • What's our role in contributing to an international climate change agreement <i>Objective: Understand global context for addressing climate change impacts.</i>	Meg Caldwell (COS)
10:30-10:45	BREAK	

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<p>10:45-11:30</p>	<p><u>PRESENTATION:</u> Understanding the enabling environment in California</p> <ul style="list-style-type: none"> • Discussion of the major regulatory paradigms in California • Issues associated with private vs. public lands • Overview of California State Adaptation Plan – coastal and ocean chapter • Review LCP process, and how adaptation planning is a critical part of LCP moving forward • Beyond LCP: Review of what this means for local agencies and organizations in management planning and decisions (e.g. permits, Climate Action Plans, General or Management Plan updates, CEQA, Hazard Mitigation Plans, grant requirements) • Federal policy and programs with implications for California (e.g. Dept of Interior’s climate strategy and establishment of CC Response Centers) <p><i>Objective: Participants understand west coast California and regional context for addressing climate change impacts.</i></p>	<p>Meg Caldwell (COS)</p> <p align="center">and</p> <p>Sara Polgar (BCDC) (Local level)</p>
<p>11:30-12:00</p>	<p><u>EXERCISE (PART A):</u> Understanding the resource setting: Group discussion and recording on flip chart of:</p> <ol style="list-style-type: none"> 1) What are the top 5 priority resources you are protecting (natural and/or infrastructure) 2) What are the existing, non-climate change stressors that you are addressing <p><i>Objective: Establish the current “setting” of priority resources and issues that managers address, within which climate change impacts occur.</i></p>	<p>Anne Walton (NOAA)</p>
<p>12:00-1:00</p>	<p>LUNCH</p>	
<p>1:00-1:30</p>	<p><u>PRESENTATION:</u> Climate change impacts on the coastal and marine environment in California including:</p> <ul style="list-style-type: none"> • Sea level rise • Extreme Weather Events • Acidification • Increase in sea temperatures • Changes in precipitation <p><i>Objective: Review at the range of climate change impacts to the coastal and marine environment and changes already observed.</i></p>	<p>Meg Caldwell (COS)</p>
<p>1:30-2:15</p>	<p><u>EXERCISE (PART B):</u> Adding climate change impacts into consideration.</p> <ol style="list-style-type: none"> 1) Continuing with top 5 priority resources ...what climate change impacts are they already experiencing? 2) What climate change impacts are anticipated? 3) How are you responding to climate impacts that you are already seeing? Are you currently taking any proactive management measures to address anticipated climate change impacts? 4) What are/might be the cumulative effects of climate change impacts and non-climate stressors with respect to these 5 priority resources? 5) How might these cumulative effects change management approaches/decisions? 	<p>Anne Walton (NOAA)</p>

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	6) Group report outs. <i>Objectives: 1) To understand the possible climate change impacts to resources and how this might affect priority resources under existing stressors, 2) Consider how addressing CC impacts may affect management approaches and 3) to understand that the ability of a natural system to be resilient to climate change depends largely on the kinds and degree of non-climate stressors that may already be impacting the environment;</i>	
2:15-3:15	<u>GUEST SPEAKER(S) AND Q&A:</u> Status of research on and understanding of climate change impacts in California (20 mins each): 1) Research to understand impacts (Guido Franco, CEC-PIER) 2) Coordination on adaptation planning: Example of the Bay Area Ecosystem Climate Change Consortium (Ellie Cohen, PRBO) 3) Q&A <i>Objectives: 1) Familiarize participants with the research efforts to better understand climate change impacts to California's coastal and marine resources, and where this information is being developed and made available. 2) Provide an example of the type of coordination and partnering that is developing to facilitate more research to fill gaps in our understanding about climate change impacts.</i>	Guido Franco (CEC-PIER) and Ellie Cohen (PRBO)
3:15-3:30	BREAK	
3:30-4:15	<u>PRESENTATION AND FACILITATED DISCUSSION: Role of Climate Change Information</u> <ul style="list-style-type: none"> • Overview of climate models • Role of climate models in planning for climate change • Using climate models as a tool in decision making process • Understanding uncertainty in climate science and how it factors into decision-making. 	Tim Doherty (BCDC)
4:15-4:45	<u>CASE STUDY PRESENTATION AND FACILITATED DISCUSSION: The San Francisco sea level rise vulnerability assessment</u> <i>Objective: 1) Gain an understanding of role of climate models in planning efforts 2) Recognize how uncertainty in climate science has implications for adaptation planning</i>	
4:45-5:00	<u>Q&A, AND WRAP-UP AND BRIDGE TO DAY 2</u>	Anne Walton (NOAA)

DINNER DISCUSSION: How are agencies and organizations addressing climate change impacts already?

Led by Anne Walton:

Kick off with description of the Climate Smart Sanctuaries Program (Anne Walton)

Maybe a status update from Kelley Higgason about Sanctuary's Scenarios Report

Building off of the initial icebreaker, participants talk more about how they are addressing CC impacts.

** Note from Anne: Need to discuss Climate Smart Sanctuaries program at the training. She suggested this approach of an evening conversation near the start of the training.

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DAY 2

Goals:

Ensure that participants understand the planning principles and process steps of climate change adaptation. Participants will also be able to articulate the steps of a climate change vulnerability assessment by gaining hands-on experience doing the assessment steps for an example management area.

Core Trainers:

Tim Doherty, Russell Jackson

TIME	SUBJECT	LEAD
8:30-8:55	<u>RECAP:</u> Presentations from two groups on previous day's material. (15mins total). Questions on previous day. (10 mins).	Groups 1&2
8:55-9:00	<u>AGENDA REVIEW</u>	Russell Jackson (CSC)
9:00-9:15	<u>PRESENTATION:</u> Overview of the Climate Change Planning Model <ul style="list-style-type: none"> • Importance of planning now for the uncertainties of climate change in the future • Scoping out the impacts of climate change to your local area • Building and maintaining support from the local to national level • Building your climate change planning team • Identifying your management area and resources of value • Conducting climate change vulnerability assessments • Conducting climate change risk assessments • Initiating the planning process • Implementing your plan • Measuring progress (evaluation) and adaptive management <p><i>Objective: Understand the entirety of the climate change planning process before engaging in the process so that the time and resource commitment necessary to complete this process is understood upfront</i></p>	Tim Doherty (BCDC)
9:15-10:00	<u>PRESENTATION AND EXERCISE:</u> Building a Climate Change Planning Team (Report out from 2 groups) <i>Objective: Understand value of taking the time to build a planning team and the different the forms that the team can take. Practice applying the key considerations in developing a planning team.</i>	Tim Doherty (BCDC)
10:00-10:15	<u>PRESENTATION:</u> Resilience to Climate Change <ul style="list-style-type: none"> • What is resilience? <ul style="list-style-type: none"> • Characteristics of resilient systems (Port Orford, OR) • Understanding relationships of resilience, adaptive capacity and coping capacity • Resilience as a climate change adaptation goal <ul style="list-style-type: none"> • Common dimensions of climate change adaptation <p><i>Objective: Understand the concept of resilience, why it is an important climate change adaptation objective for coastal and marine resource managers, and how resilience is enhanced.</i></p>	Russell Jackson (CSC)
10:15-		

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10:30	BREAK	
10:30-11:00	<p><u>FACILITATED DISCUSSION:</u> Opportunities and Barriers to Enhancing Resilience to Climate Change</p> <p><i>Objective: Understand what are the opportunities and challenges in enhancing resilience in coastal and marine environments and communities.</i></p>	Russell Jackson (CSC)
11:00-11:10	<p><u>PRESENTATION:</u> Overview of Planning Model Steps for Days 2-5</p> <ul style="list-style-type: none"> • Developing the context for assessment and planning steps <ul style="list-style-type: none"> ◦ Identifying the planning area, assets, current stressors, and project climate change impacts • Vulnerability assessment • Risk assessment • Prioritizing assets for adaptation planning • Developing issue statements • Developing adaptation strategies • Analyzing adaptation strategies (if time permits) <p><i>Objective: Understand the “roadmap” of assessment and planning steps that will be undertaken in the remainder of the training.</i></p>	Tim Doherty (BCDC)
11:10-11:45	<p><u>PRESENTATION:</u> Vulnerability Assessment and Risk Assessment</p> <ul style="list-style-type: none"> • Need for vulnerability and risk information in adaptation planning • Terminology and definitions <ul style="list-style-type: none"> ◦ Social-ecological systems, assets, planning areas • Distinctions between Impacts, Vulnerability and Risk Assessments <ul style="list-style-type: none"> ◦ Roles in adaptation planning • Considerations prior to starting a vulnerability assessment • Steps for conducting vulnerability assessment <ul style="list-style-type: none"> ◦ Context ◦ Exposure & Sensitivity ◦ Adaptive Capacity ◦ Vulnerability Estimation <p><i>Objective: Understand fundamental concepts of risk and vulnerability assessment and gain exposure to assessment methods</i></p>	Russell Jackson (CSC)
11:45-12:45	LUNCH	
12:45-1:45	<p><u>EXERCISE:</u> Context for the Vulnerability Assessment</p> <ul style="list-style-type: none"> • Defining the Planning Area • Identifying Social-Ecological Systems and Assets • Identifying Current Stressors to the Assets 	Russell Jackson (CSC)
1:45-2:45	<p><u>EXERCISE:</u> Vulnerability Assessment</p> <ul style="list-style-type: none"> • Describing Projected Changes in Climate and Impacts • Sensitivity Analysis • Adaptive Capacity and Vulnerability 	Russell Jackson (CSC)
2:45-3:00	BREAK	

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3:00-3:45	<u>EXERCISE:</u> Risk Assessment <ul style="list-style-type: none">• Probability of climate change impacts occurring• Consequence to the assets of impacts occurring• Risk estimation	Tim Doherty (CSC)
3:45-4:45	<u>PRESENTATION & EXERCISE:</u> Prioritizing Planning Assets <ul style="list-style-type: none">• Criteria for prioritizing• Priority rating• Evaluating uncertainty in the priority rating	Tim Doherty (BCDC)
4:45-5:00	<u>PRESENTATION & HOMEWORK ASSIGNMENT FOR DAY 3!</u> Writing Issue Statements	Tim Doherty (BCDC)

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DAY 3

Goals:

Participants will articulate the potential outcomes, products and lessons learned from climate change vulnerability assessments, as well as learn how to apply vulnerability assessment methodology to their own management area. Participants will become familiar with adaptation options for protection of coastal and marine resources, and understand issues for consideration in implementing different types of adaptation approaches. Through the field trip activities, they will gain experience discussing climate change impacts and possible adaptation strategies with members of a coastal community organization.

Core Trainers:

Anne Walton, Meg Caldwell

Guest Speakers:

Jeremy Lowe (PWA), Lesley Ewing (CA Coastal Commission), Bob Battalio (PWA), Jack Liebster (Marin Community Development Agency), Lorraine Parsons (Giacomini Wetlands Restoration Project), Members of the Tomales Bay Watershed Council and PRBO Scientists

TIME	SUBJECT	LEAD
8:30-9:00	<u>AN ISSUE STATEMENT “Gallery Walk”</u> Post the issue statements (that groups prepared as homework) around the room. Allow time for reviewing the statements. Do critiques of the issue statements to provide feedback to groups for refinements.	Anne Walton (NOAA)
9:00-9:05	<u>AGENDA REVIEW</u>	Meg Caldwell (COS)
9:05-9:30	<u>GUEST SPEAKER:</u> Shore Responses to Sea Level Rise. <i>Objective: 1) Familiarize participants with shoreline morphology, and understand how erosion and flooding hazards are effected by sea level rise and how this impacts coastal zone planning and management. 2) Address how proactive coastal zone management is supported from a physical process perspective.</i>	Bob Battalio (PWA)
9:30-10:00	<u>GUEST SPEAKER:</u> A shoreline sea level rise vulnerability assessment and adaptation options for the Hayward Area Shoreline <i>Objective: 1) Illustrate how a well-structured (yet, low-cost) preliminary vulnerability assessment can identify key issues and vulnerable resources and highlight possible adaptation options and issues. 2) Show how the outcomes and products of a vulnerability assessment can be used to educate key stakeholders and decision-makers about climate change issues and build support for further adaptation planning and adaptation measures.</i>	Jeremy Lowe (PWA)
10:00-10:15	BREAK	
10:15-11:45	<u>PRESENTATION(S), CASE STUDIES AND DISCUSSIONS: Adaptation Options</u> <i>Lesley Ewing (incorporating adaptation into engineered structures and beach nourishment in adaptation planning); Meg Caldwell (legal issues associated with proactive adaptation options); Bob Battalio (Managed retreat/realignment, California Case Studies: Pacifica State Beach, Capitola, Ocean Beach San Francisco, Marin Baylands buffers)</i> <i>Objective: Familiarize participants with the breadth of adaptation options, or</i>	Lesley Ewing (CCC); Meg Caldwell (COS); Bob Battalio (PWA)

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	<i>approaches, for coastal and marine resource managers– some that are novel approaches to management; others that managers may already be aware of or have implement in other contexts or for other purposes. Address the legal uncertainties associated with a proactive approach to adaptation.</i>	
11:45-12:30	<u>FIELD TRIP OVERVIEW/ORIENTATION:</u> Review field trip agenda Groups have time to prepare questions for discussion with the community group members	Anne Walton (NOAA)
12:30-1:30	LUNCH **includes 30 minutes travel time to site**	
1:30-5:00	<u>FIELD TRIP:</u> 1) Tour of Giacomini Wetlands Restoration in Tomales Bay and presentation about wetlands as a method for protection against storm surge, flooding, and shoreline erosion. 2) Conduct interviews with local community group members (Tomales Bay Watershed Council) and local biologists (PRBO) to develop community plant, animal, and infrastructure inventories.	1) Lorraine Parsons (Giacomini Wetlands Restoration Project Manager) 2) Jack Liebster (Marin County Comm. Dev Agency)
5:00-5:30	<u>WRAP UP AND BRIDGE TO DAY 4/ TRAVEL BACK FROM FIELD TRIP:</u>	Trainer from core team

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DAY 4

Goals:

Participants will be able to describe how to prioritize climate change issues, conduct a planned adaptation approach and analyze adaptation options for their management areas. Participants will become familiar with the goals and forms of public engagement, the unique issues related to communication of climate change impacts and adaptation to various stakeholders who hold different perceptions of the issues, and will be able to articulate techniques for effectively addressing these issues.

Core Trainers:

Tim Doherty, Russell Jackson

Guest Speakers:

Susi Moser (Susanne Moser Research & Consulting, and UC-Santa Cruz)

TIME	SUBJECT	LEAD
8:30-8:55	FIELD TRIP RECAP: Presentations from 1 group on previous day's material. (10 mins total). Questions on previous day. (10 mins).	Group 2
8:55-9:00	AGENDA REVIEW	Anne Walton (NOAA)
9:00-9:15	PRESENTATION: Review: Prioritizing Climate Change Assets and Issues Adaptation Goals and Outcomes <ul style="list-style-type: none"> • Setting adaptation goals based on prioritization • Defining outcomes for priority assets and issues 	Anne Walton (NOAA)
9:15-10:00	EXERCISE: Reexamining Asset and Issue Prioritizations & Setting Goals and Defining Outcomes	
10:00-10:30	PRESENTATION: Planned Adaptation to Climate Change in the Coastal Zone <ul style="list-style-type: none"> • Selecting adaptation measures • Mainstreaming adaptation measures • Barriers to mainstreaming adaptation • Overcoming barriers to adaptation • Responsive and planned adaptation • Criteria for selecting strategies • Definitions of adaptation strategies DISCUSSION: <i>Focus this discussion around some examples (real or contrived) that exemplify the points raised in the presentation.</i> <ul style="list-style-type: none"> • Priorities, goals, plans and tradeoffs • How to make informed tradeoff decisions • How to maintain transparency and stakeholder input <i>Objective: Understand that the selection of adaptation options is to meet the goals, however, they will also have larger implications (tradeoffs) that need to be considered upfront.</i>	Russell Jackson (CSC)
10:30-10:45	BREAK	
10:45-12:15	EXERCISE: Developing Coastal Adaptation Strategies for Tomales Bay	Russell Jackson (CSC)

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	<ul style="list-style-type: none"> Identify the most suitable adaptation options for the protection of each priority asset by determining the option that best meets the climate change planning goal(s). 	
12:15-1:15	LUNCH	
1:15-2:30	<p><u>CONT'D EXERCISE:</u> Developing Coastal Adaptation Strategies for Tomales Bay</p> <ul style="list-style-type: none"> Identify the most suitable adaptation options for the protection of each priority asset by determining the option that best meets the climate change planning goal(s). 	Russell Jackson (CSC)
2:30-2:45	BREAK	
2:45-3:45	<p><u>PRESENTATION:</u> Introduction to this portion of the training Public Engagement in Climate Change Adaptation Planning</p> <p><u>DISCUSSION:</u> Public Engagement – Pros and Cons, Good and Bad Ways of Doing It</p> <p><i>Objective: 1) Understand the goals and different forms of engaging the public in adaptation planning. 2) Understand the unique challenges (and opportunities) associated with communicating with stakeholders and community members (in general) about climate change impacts and adaptations. 3) Learn about techniques to be more effective in engaging the public.</i></p>	Susi Moser
3:45-4:45	<p><u>PRESENTATION:</u> Climate Change Risk Perceptions and the Challenges of Communicating Impacts and Adaptation</p> <ul style="list-style-type: none"> How does risk perception work, and why is it important for adaptation policy and planning? What do we know about effectively communicating with decision-makers and stakeholders on climate change, impacts, and adaptation? <p><u>EXERCISE:</u> Communication exercise</p> <p><i>Objective: 1) Understand how risk perception varies among groups and individuals. 2) Understand how risk perceptions are relevant to adaptation planning and policy. 3) Learn methods for effectively communicating climate change impacts and adaptation when engaging decision-makers and other stakeholders.</i></p>	Susi Moser
4:45-5:15	<p><u>WRAP-UP AND BRIDGE TO DAY 5:</u></p> <ul style="list-style-type: none"> Information and expectations for the Group Presentations (15 minutes for each group presentation) Each group presents about its models. <ul style="list-style-type: none"> List of priority resources (assets) for protection; Areas of vulnerability; Areas of risk; Issue statements (in regards to CC threats to each priority resource (asset)); Adaptation options for protecting each priority resource (asset); 	Trainer from core team

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	<ul style="list-style-type: none">○ Analysis of each adaptation option (how well it meets established criteria)• Groups choose presentation time <p><i>** Although the groups will be given additional time to work on developing adaptation strategies, and a little time to prepare for the presentations, they are expected to work on their own in the evening (if need be) to be prepared.</i></p>	
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DAY 5

Goals:

Participants will articulate the steps for, outcomes of, and lessons learned from their adaptation planning exercise for their example site. They will gain experience communicating with a specific audience about the climate change adaptation plans that they have developed. Participants will describe how they plan to apply the information, tools and methodologies from the training in their work.

Core Trainers:

Anne Walton, Meg Caldwell, Russell Jackson, Tim Doherty

TIME	SUBJECT	LEAD
8:30-9:00	<u>RECAP:</u> Presentation from one group on previous day's material. (10 mins). Questions on previous day. (10 mins).	Group 3
9:00-10:15	<u>CONT'D EXERCISE:</u> Developing Coastal Adaptation Strategies for Tomales Bay <ul style="list-style-type: none"> Identify the most suitable adaptation options for the protection of each priority asset by determining the option that best meets the climate change planning goal(s). 	All Core Trainers
10:15-10:30	BREAK	
10:30-11:00	<u>CONT'D EXERCISE:</u> Developing Coastal Adaptation Strategies for Tomales Bay <ul style="list-style-type: none"> Identify the most suitable adaptation options for the protection of each priority asset by determining the option that best meets the climate change planning goal(s). 	All Core Trainers
11:00-12:00	<u>PREPARATION FOR PRESENTATIONS</u> <i>Make sure that presentations are loaded onto the computer.</i>	All Core Trainers
12:00-1:00	LUNCH	
1:00-1:30	<u>GAME</u>	Trainer from Core Team
1:30-1:50	<u>GROUP 1 PRESENTATION</u>	
1:50-2:10	<u>GROUP 2 PRESENTATION</u>	
2:10-2:30	<u>GROUP 3 PRESENTATION</u>	
2:30-3:00	<u>QUESTIONS FOR GROUPS & DISCUSSION</u>	
3:00-3:30	<u>WRAP UP:</u> Evaluations, Implementation Plans	Anne Walton (NOAA)