



Climate-Smart Adaptation for the North-central California Coast and Ocean

Gulf of the Farallones National Marine Sanctuary
Ocean Climate Initiative

Vulnerability Assessment Webinar

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Two Big Questions to answer:

1. How vulnerable are the species, habitats, and ecosystem services that we care about to climate change? [Vulnerability Assessment]
2. What can we do to limit or reduce vulnerability? [Adaptation Planning]

Climate-Smart Adaptation promotes nature-based solutions to:

- Reduce greenhouse gas emissions and enhance carbon sinks
- Reduce climate change impacts on wildlife and people and enhance resilience
- Sustain vibrant, diverse ecosystems



Hydrocoral. Credit: Steve Lonhart, MBNMS



Pacifica. Credit: Jack Sutton



Taylor's Sea Hare. Credit: Jennifer Stock, CBNMS

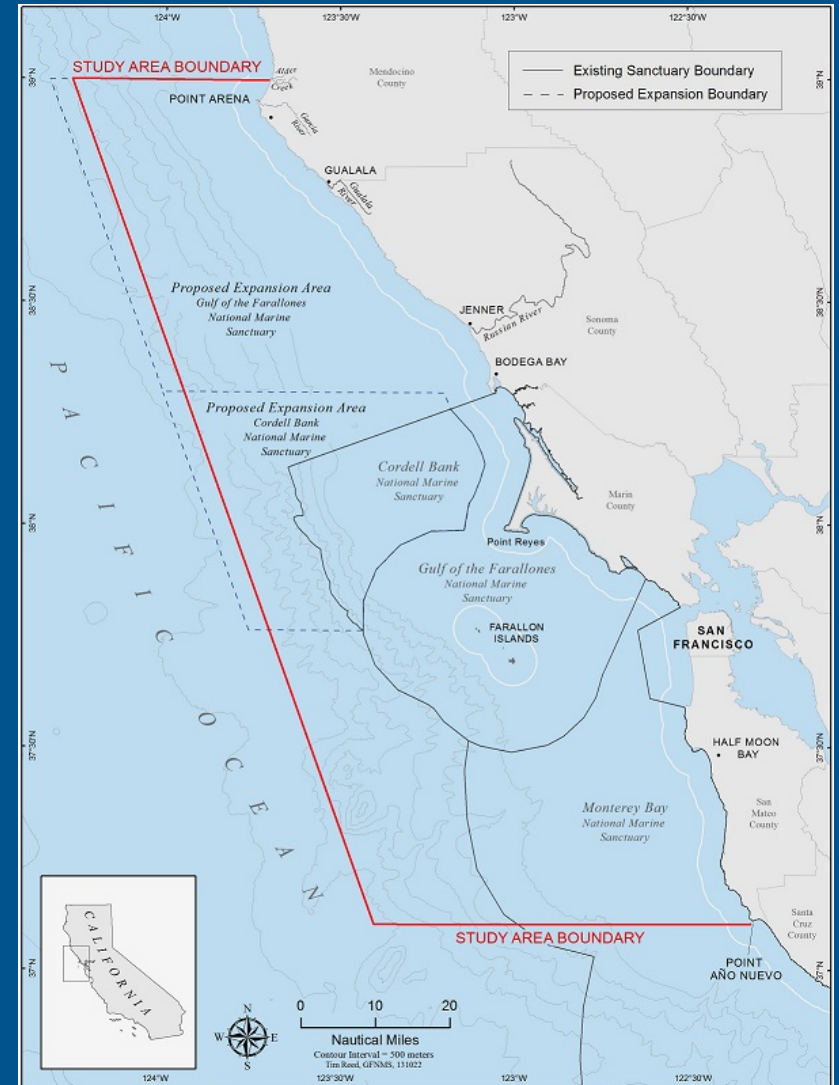
Climate-Smart Adaptation for the North-central California Coast and Ocean

Goal

Protect and maintain healthy ecosystems by enhancing the resilience of species, habitats and ecosystem services to the impacts of climate change through collaboratively developed adaptive management solutions that are feasible, effective, and nature-based.

Geographic Scope

Año Nuevo, San Mateo County to Alder Creek, Mendocino County



Project Partners



CALIFORNIA
ACADEMY OF
SCIENCES



Point Blue
Conservation
Science



Phase 1: Vulnerability Assessment

Workshop 1: Define focal resources (11 Feb 2014)

- Species
- Habitats
- Ecosystem services



Workshop 2: Assess Vulnerability (10-11 June 2014)

- Literature review
- Expert elicitation



Phase 2: Adaptation Planning

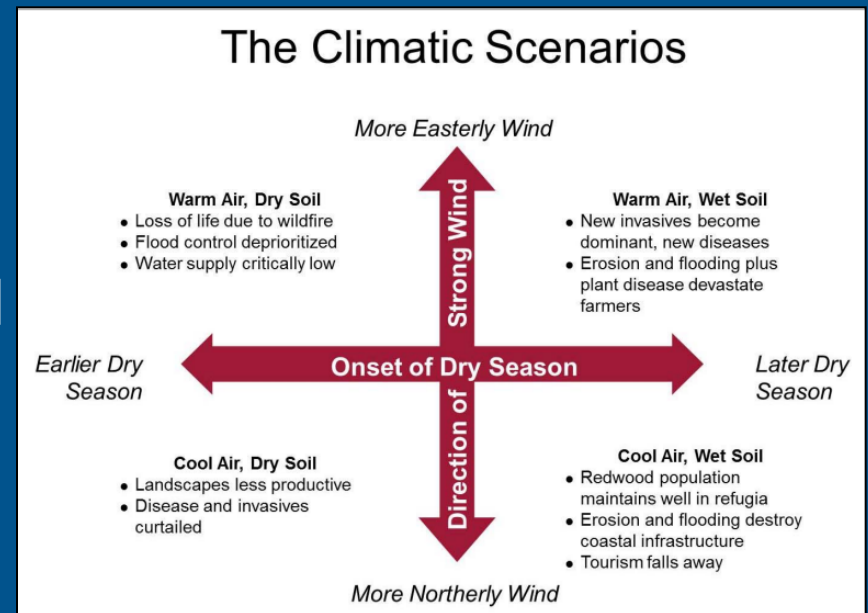
Request Working Group of the GFNMS Advisory Council:

1) Define distinct climate scenarios:

Multiple plausible futures based on most uncertain and impactful drivers of change

2) Provide Adaptation Recommendations:

Develop, evaluate and prioritize potential actions for each climate scenario



Futures of Wild Marin, Scenario Planning for Climate Change Adaptation

Phase 2: Adaptation Planning

Implementation Plan

- Summary of approved and/or modified adaptation actions
- Implementation prioritization and schedule
- Estimated cost and potential funding sources
- Participating partners



Focal Resources Workshop

Workshop Goal:

Recommend North-central California coast and ocean focal resources (species, habitats and ecosystem services) for use in vulnerability assessments.

Recommendations produced in habitat break-out groups

- 53 species
- 9 services
- 10 habitats



Steve Lonhart
MBNMS



Focal Resources Workshop

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Recommendations

produced in habitat
break-out groups

- 53 species
- 9 services
- 10 habitats

Finalized by staff and
planning committee

- 42 species
- 8 services
- 8 habitats

Final Focal Resources

Habitat Assemblage	Species
<p>Nearshore</p> <ol style="list-style-type: none">1. Rocky intertidal and offshore rocks2. Kelp forest (including rocky subtidal)3. Nearshore water column/soft-bottom subtidal	<ol style="list-style-type: none">1. Ashy Storm Petrel2. Black Abalone3. Black Oystercatcher4. Blue Rockfish5. California Mussel6. Coralline Algae7. Monkeyface Prickleback8. Ochre Seastar9. Octopus (Giant Pacific and Red)10. Red Abalone11. Sea Urchin (Red and Purple)12. Sea Palm13. Southern Sea Otter14. Steller Sea Lion15. Tufted Puffin16. White Shark

Final Focal Resources

Habitat Assemblage	Species
<p>Offshore</p> <p>4. Pelagic water column and associated benthic habitats for specific shallow banks in the deep water region: Cordell, Rittenburg, Fanny Shoals</p>	<ol style="list-style-type: none">1. Blue Whale2. California Hydrocoral, Red Sponge3. Cassin's Auklet4. Copepod and Pteropod5. Dungeness Crab6. Northern Anchovy7. Pacific Krill8. Pacific Sardine9. Widow Rockfish
<p>Estuaries</p> <p>5. Estuaries (open year-round, including river mouths)</p> <p>6. Ephemeral estuaries</p>	<ol style="list-style-type: none">1. Black Rail2. Coho and Chinook Salmon3. Egret (Great, Snowy and/or GBH)4. Gaper Clam5. Oyster6. Pacific Herring7. Tidewater Goby

Final Focal Resources

Habitat Assemblage	Species
Coastal 7.Sandy beach and dunes 8.Cliffs	1. American Dune Grass 2. Brandt's Cormorant 3. Common Murre 4. Harbor Seal 5. Mole Crab 6. Myrtle's Silver Spot Butterfly 7.Northern Elephant Seal 8. PigeonGuillemot 9. Shorebirds (Sanderling, Willet, Marbled Godwit) 10. Western Snowy Plover

Final Focal Resources

Ecosystem Services	
Ecological Integrity	<ol style="list-style-type: none">1. Biodiversity2. Habitat
Provisioning Services	<ol style="list-style-type: none">3. Food production
Regulating Services	<ol style="list-style-type: none">4. Flood protection/Erosion control5. Water quality6. Carbon Storage
Cultural Services	<ol style="list-style-type: none">7. Aesthetic/Cultural/Spiritual Value8. Recreation and Tourism Value

Before the June Workshop...

- 1) Visit the workshop webpage here:
<http://www.ecoadapt.org/workshops/ca-coast-va-workshop>
- 2) Study up on climate impacts and your habitat information sheets
- 3) Fill out the pre-workshop survey:
<https://www.surveymonkey.com/s/JWHMDP3>

Thank you!

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