

# PG&E WaveConnect Humboldt Working Group

**October 5, 2009**



# Humboldt Working Group (HWG)

## Groundrules

- Participate in an active and focused manner—commit to process success.
- Interact with all other members respectfully.
- Communicate interests, not positions.
- Be brief in communications, and be prepared.
- Help involve all.
- Seek solutions for all.
- Commit to a good faith effort.
- Share relevant information.
- Communicate effectively—open, frank communications with the larger community, “not-for-attribution” to individuals in the group.
- Attend all meetings; start on time.
- Keep cell phones on silent.



# Facilitator Responsibilities

- Maintain a neutral position as project issues are discussed.
- Help the group accomplish its objectives.
- Help guide the discussion.
- Enforce participant ground rules.
- Help involve all.
- Ask "why" to clarify interests.
- Ensure a smooth process.
- Retain confidential information as confidential to individual participants.
- Manage time.
- Track actions, next steps, deadlines.

# Agenda

- I. Light Supper/Snacks.....5:30 p.m. – 6:00 p.m.
- II. Review Agenda, Groundrules .....6:00 p.m. – 6:10 p.m.
- III. Updates on Recent Activities.....6:10 p.m. – 6:15 p.m.
- IV. Update on Environmental Baseline Data, Impact Analysis, and Adaptive Management and Monitoring.....6:15 p.m. – 7:00 p.m.
- V. Break.....7:00 p.m. – 7:10 p.m.
- VI. Brainstorm Future HWG Topics.....7:10 p.m. – 8:00 p.m.
- VII. Debrief Permitting Authority Subcommittee Meetings.....  
.....8:00 p.m. – 8:15 p.m.
- VIII. Discuss Cable Lay Siting Proposal.....8:15 p.m. – 8:30 p.m.
- IX. Present MarineMap GIS System..... 8:30 p.m. – 9:00 p.m.
- X. Next Steps, Adjourn.....9:00 p.m.

# Environmental Permitting Progress Report

- **Baseline Data Gathering**
- **Impact Analysis**
- **Monitoring and Adaptive Management Planning**



# Status Report

- Completed Draft Baseline Studies (Affected Environment)
- Beginning work on Impact Assessment
- Baseline and Impact Assessment will be content for permit applications
- Monitoring and Adaptive Management Planning

# Permit Applications – A Reminder

- FERC Hydrokinetic Pilot Project License
- State Lands Commission Lease/CEQA Compliance
- Coastal Development Permits – Coastal Commission
- Other Federal Authorizations
  - Endangered Species Act – USFWS and NMFS
  - Marine Mammals Act – NMFS
  - National Historic Preservation Act Section 106 - SHPO
  - Rivers and Harbors Act Section 10 - USACE
- Other State Authorizations
  - California Endangered Species Act - CDFG
  - Section 401 Water Quality Certification - RWQCB
  - 1603 Streambed Alteration Agreement - CDFG



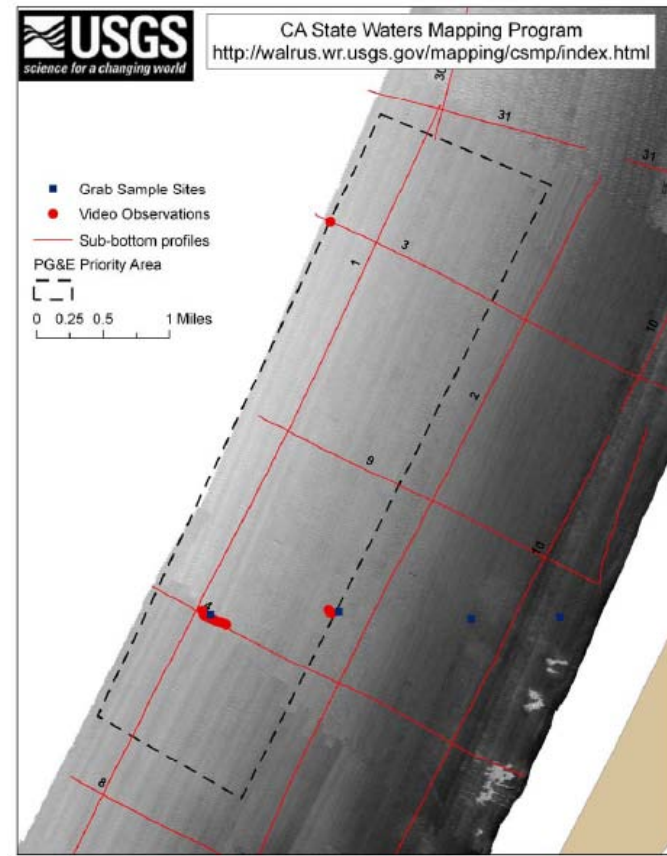
# FERC Environmental Document Topics

- Environmental Resource Topic Areas:
  - Geology and Soils
  - Water Resources
  - Marine Fish and Aquatic Resources
  - Marine Wildlife
  - Terrestrial Resources
  - Rare, Threatened, and Endangered Species
  - Recreation and Land Use
  - Cultural Resources
  - Aesthetic Resources
  - Socioeconomic Resources



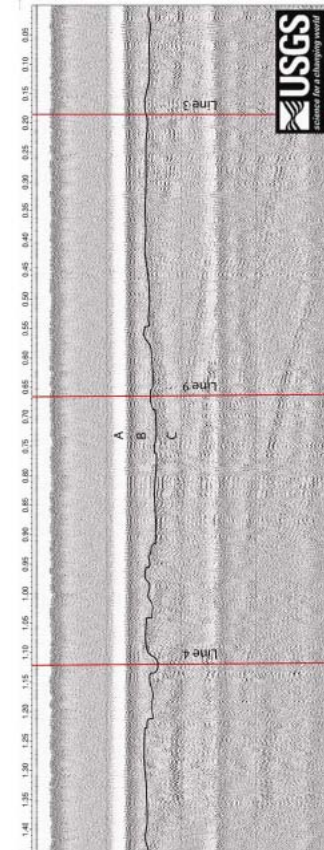
# Geology and Soils - Sources

- Baseline information Sources:
  - Geological maps
  - Seismic history
  - HSU Tsunami research
  - Onshore soils maps
  - USACE studies
- State Marine Mapping Program
  - Sub-bottom profiles
  - Bathymetry
  - Grain size analysis
  - Seafloor biota samples



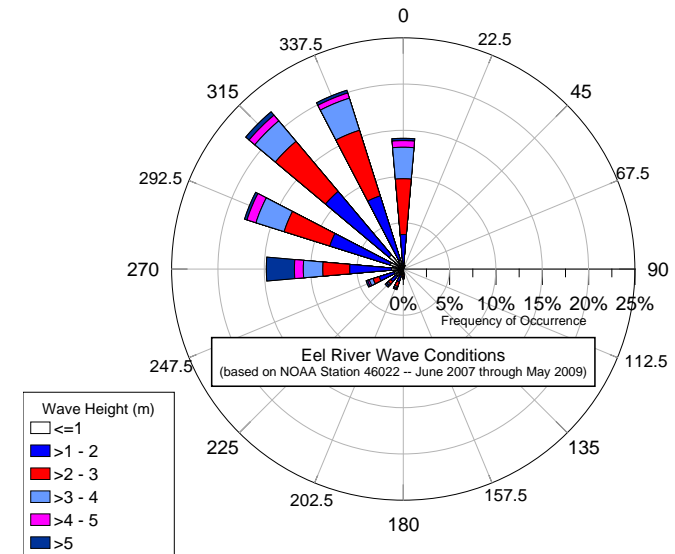
# Geology and Soils - Findings

- Key Findings:
  - Mendocino Triple - Junction Tsunami hazard
  - WaveConnect site sea area floor is:
    - Sandy mud and muddy sand
    - 8 to 24 meters to bedrock
    - Fish, flatfish, invertebrates
- Next Steps - obtain:
  - One-meter resolution bathymetry
  - Results of seafloor biota sampling



# Water Resources - Sources

- Wave Data Sources:
  - Eel River NOAA Buoy 46022 – from 1982, directional data from 2007
  - South Spit NOAA Buoy 46212, directional data from 2004
  - NOAA bathymetry shape files
- Water Quality Sources
  - Trinidad Head Area of Special Biological Significance data
  - HSU Center for Integrative Coastal Observation, Research, and Education has most comprehensive water quality data (salinity, DO, turbidity, and chlorophyll-a) for Trinidad Pier, Dock A
  - NOAA, Scripps buoys provide water temperature data



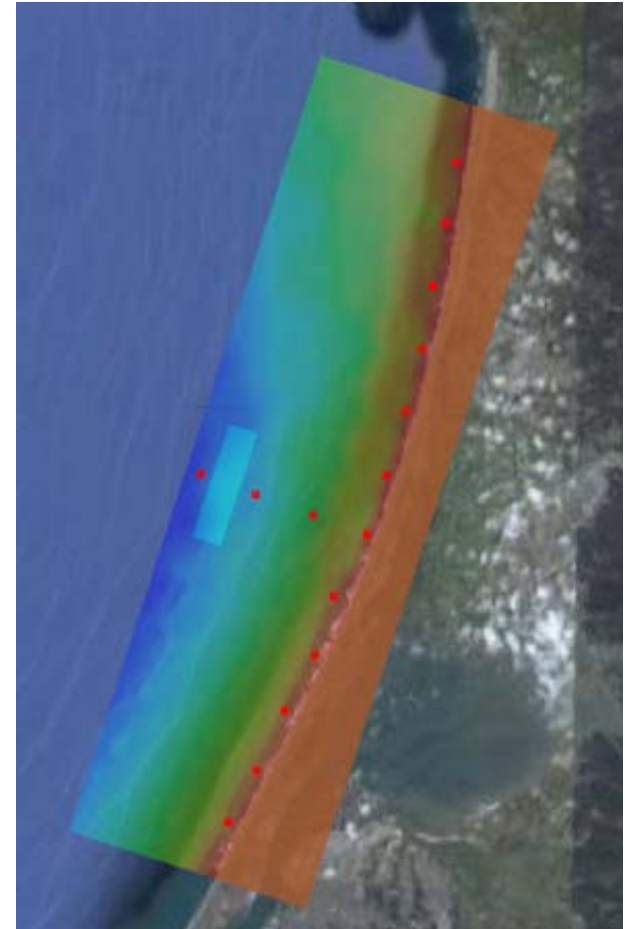
# Annual Significant Wave Height



HWG

# Water Resources - Findings

- Key findings:
  - Prevailing wave direction 290° to 340°
  - Seasonal pattern of wave height/period
- Next steps:
  - CMS-Wave (USACE WABED) Coastal Modeling program
  - Analysis of effects on waves and sediment transport



# Marine Fish and Aquatic Resources - Sources

- Local Invertebrate and Fish Sources:
  - HSU Theses and personal communications with students and faculty
  - Samoa Beach Surf Zone disposal surveys (2006-2007)
  - Nearshore disposal site surveys (1989-1990)
  - Louisiana Pacific outfall surveys (1994)
  - Humboldt Bay reports
  - National Park Service
  - Local fishermen
- Peer-reviewed literature:
  - Synthesized >100 references on species from other portions of their range describing behavior, habitat use, seasonality, etc.



# Marine Fish and Aquatic Resources - Findings

- Key findings:
  - **Fish:** assemblages in the area include flatfishes, coastal pelagic schooling fishes, sharks/skates/rays
  - **Invertebrates:** intertidal razor clams, sand crabs, subtidal sand dollars, Crangon, and mysids (important prey species)
  - **Fisheries resources:** Dungeness crab, salmon, surfperch, smelts, rockfish
- Next steps:
  - Incorporate any new existing information



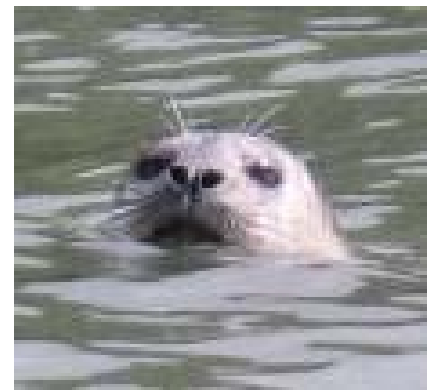
# Marine Mammals - Sources

- Local sources:
  - HSU theses and personal communications with students and faculty
  - Cascadia Research
- Peer-reviewed literature
  - Synthesized >200 references on species from other portions of their range describing behavior, habitat use, physiology, etc.



# Marine Mammals - Findings

- Key findings:
  - **Pinnipeds:** Harbor seals, California sea lions, and Steller seal lions likely in the area; Steller sea lions pup on the north coast, harbor seals pup in Humboldt Bay
  - **Cetaceans:** Harbor porpoise, gray whales, humpback whales, and killer whales likely in the area
- Next steps
  - HSU staff information
  - Redwood Sciences Laboratory information



# Terrestrial Resources Sources

- Sources
  - HBNWR studies of Ma'le'i and Lamphere Dunes
  - Previous studies of North Spit
  - Spring botanical surveys conducted in May 2009
  - Wildlife reconnaissance surveys



# Terrestrial Resources Findings

- Key findings:
  - **Vegetation/Habitats:** Dune mat, foredune grasslands, dune swales, northern coastal bluff scrub, dune forests, freshwater and brackish marsh, ruderal herbaceous vegetation
  - **Wildlife:** 29 seabird species; small mammals and other medium-sized predators (fox, raccoons)
- Next steps:
  - Finalize survey of onshore project site and buffer area and assess effects on habitats

# Rare, Threatened and Endangered Species

- Sources:
  - California Natural Diversity Database
    - Maps Sensitive Species findings in project area
    - California Native Plant Society
  - Agency Response letters:
    - US Fish and Wildlife Service
    - National Marine Fisheries Service
    - California Department of Fish and Game



# Rare, Threatened and Endangered Species

- Terrestrial species:
  - **Plants:** 27 species have potential to occur; no Critical Habitat
  - **Wildlife:** 7 species have potential to occur in area; Critical Habitat for western snowy plover on South Spit and marbled murrelet in HWCP area
- Marine species:
  - **Fish:** 11 species have potential to occur in area, including salmon that spawn in rivers and streams far from the Project area; Critical Habitat for green sturgeon; Essential Fish Habitat
  - **Mammals:** 16 cetaceans and 5 pinnipeds have potential to occur in the area, protected under ESA and MMPA; no Critical Habitat

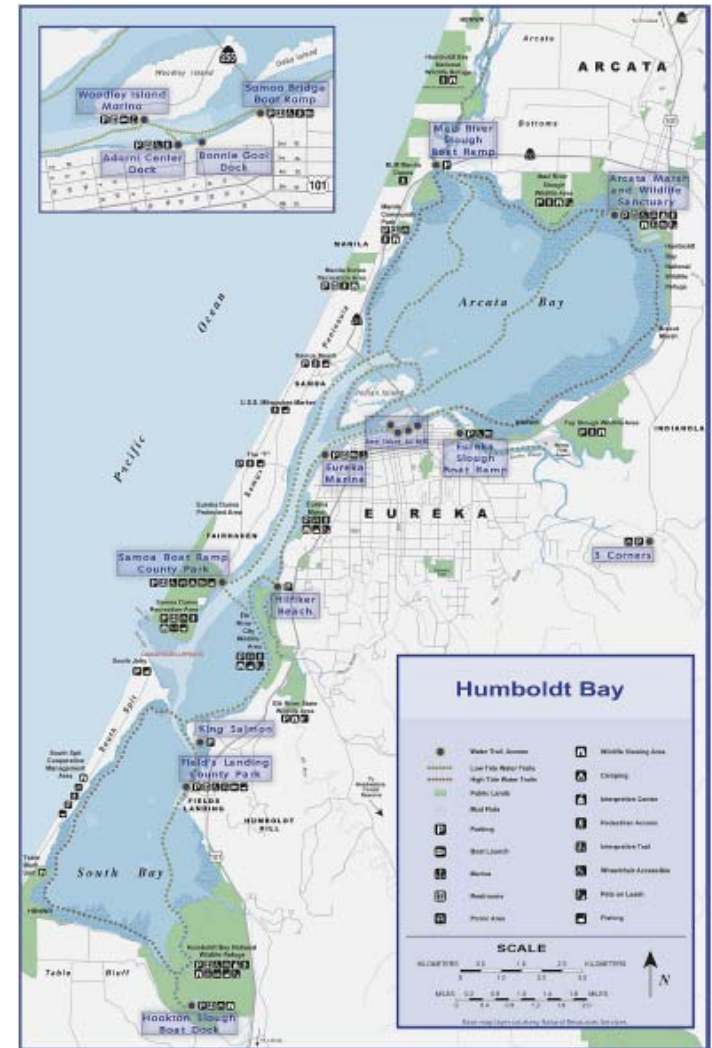
# Rare, Threatened and Endangered Species

- Next steps:
  - Evaluate listed species' habitat and life-cycle requirements and vulnerabilities
  - Assess potential project effects
  - Design mitigation measures, if necessary
  - Consult with Agencies
  - Prepare Biological Assessments



# Recreation and Land Use - Sources

- Sources
  - Humboldt Bay Management Plan
  - Humboldt Bay Area Plan
  - U.S. Navy Northwest Training Complex DEIS
  - Humboldt County GIS
  - USFWS recreational survey data
  - California Department of Parks and Recreation data
  - California Recreational Fisheries Survey data

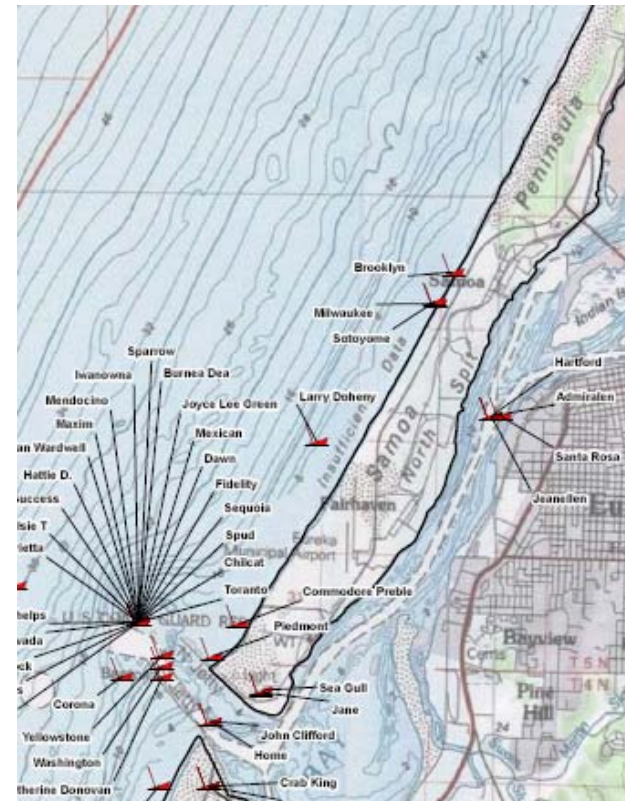


# Recreation and Land Use - Findings

- Key findings:
  - North Spit uses and zoning:
    - Industrial and Coastal Dependent zoning adjacent to key recreational areas
  - Variety of marine uses
    - Active port, shipping
    - Strong commercial fishery
    - Recreational fishery
    - Boating, surfing, whale-watching
- Next steps:
  - Consistency with Plans
    - California Coastal Plan
    - Humboldt Bay Area Plan
  - What are the potential conflicts with recreational uses?

# Cultural Resources - Sources

- California Historical Resources Information System Record search
- State Lands Commission Shipwrecks database
- National Register of Historic Places
- California Register of Historical Resources
- Historical societies
- Local histories



# Cultural Resources - Findings

- Key findings
  - 36 studies conducted within 1 mile (North and South Spit)
  - 41 archeological sites within 1 mile
  - 62 shipwrecks recorded
- Next Steps:
  - Conduct pedestrian archaeological survey of onshore areas
  - Advise cable routing for shipwreck avoidance

# Aesthetic Resources - Sources

- Sources
  - Humboldt Bay Area Plan
  - Designated Scenic Areas
  - Fieldwork to establish key viewing areas and viewer populations
- Key Observation Points:
  - Mad River County Park
  - Ma-Le'l Cooperative Dunes Unit
  - Manila Dunes Recreation Area (overlook station)
  - Samoa Beach

# Aesthetic Resources - Findings

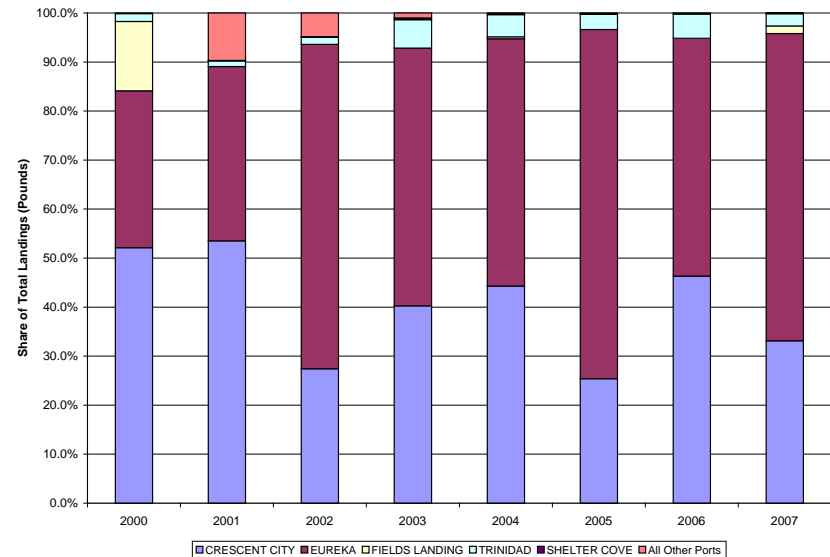
- Key Findings
  - Key viewsheds are the recreation areas
- Next steps
  - Develop simulated views of the project area
  - Assess project visual impacts



View from Manila Dunes Recreation Area

# Socioeconomic Resources - Sources

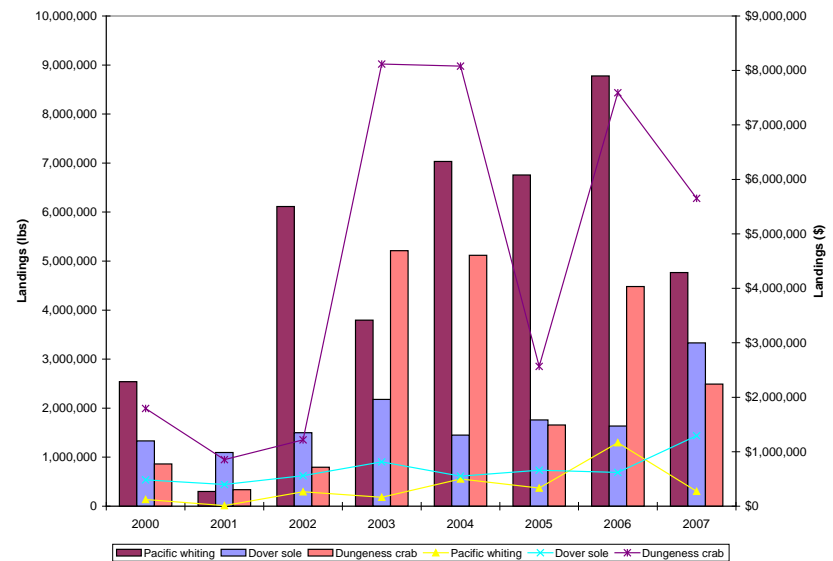
- Sources
  - California Department of Finance
  - California Department of Fish and Game
  - Humboldt Bay Harbor and Recreation District
  - Employment Development Department
  - State Controller
  - US Census



Eureka Area Fisheries Landing Share

# Socioeconomic Resources

- Key findings:
  - Fish landing value from Dungeness crab, Pacific whiting, and Dover sole
  - 9,000 licensed commercial fishermen
  - Eureka area 5 to 12 percent of state's fishery 2001-2004
- Next steps:
  - Analyze effect of HWCP on local and regional economy



Weight and Value of Fisheries Landings, Port of Eureka (2000 to 2007)

# Next Phase - Impact Assessment

- Goal of Impact Assessment is to identify and mitigate all potentially significant adverse impacts
- Identify effects by discipline
  - Are they adverse effects?
  - If so, are they significant adverse effects?
  - If so, what measures reduce the effects to acceptable levels?
- Understand resource sensitivity and project effects
  - Concept of permitting 'envelope' or 'outer bound'
    - Analyze noisiest, largest, most disruptive candidate WEC
    - Screening level analysis
- Identify monitoring needs

# Monitoring and Adaptive Management

- Why Monitor?
  - Protect against unforeseen circumstances
  - Make certain mitigation measures are working
  - FERC Pilot Project License requires it
  - Monitor when you are not certain a that adverse impact will occur – but need more protection from uncertainty
    - Example: FAD, seal haul-out

# Monitoring and Adaptive Management

- Planning Monitoring
  - Address specific issues or questions for a specific purpose
  - Establish significance criteria in advance
  - Plan for unforeseen circumstances
- Adaptive Management
  - If unforeseen occurs (or foreseen is confirmed) –
    - Evaluate the impact
    - If adverse and significant, address the problem
  - Modify the mitigation measures, invent new measures, modify the project, modify the monitoring

# Break



HWG

# Permitting Authority Subcommittee Update



HWG

# Proposed HWG Topics

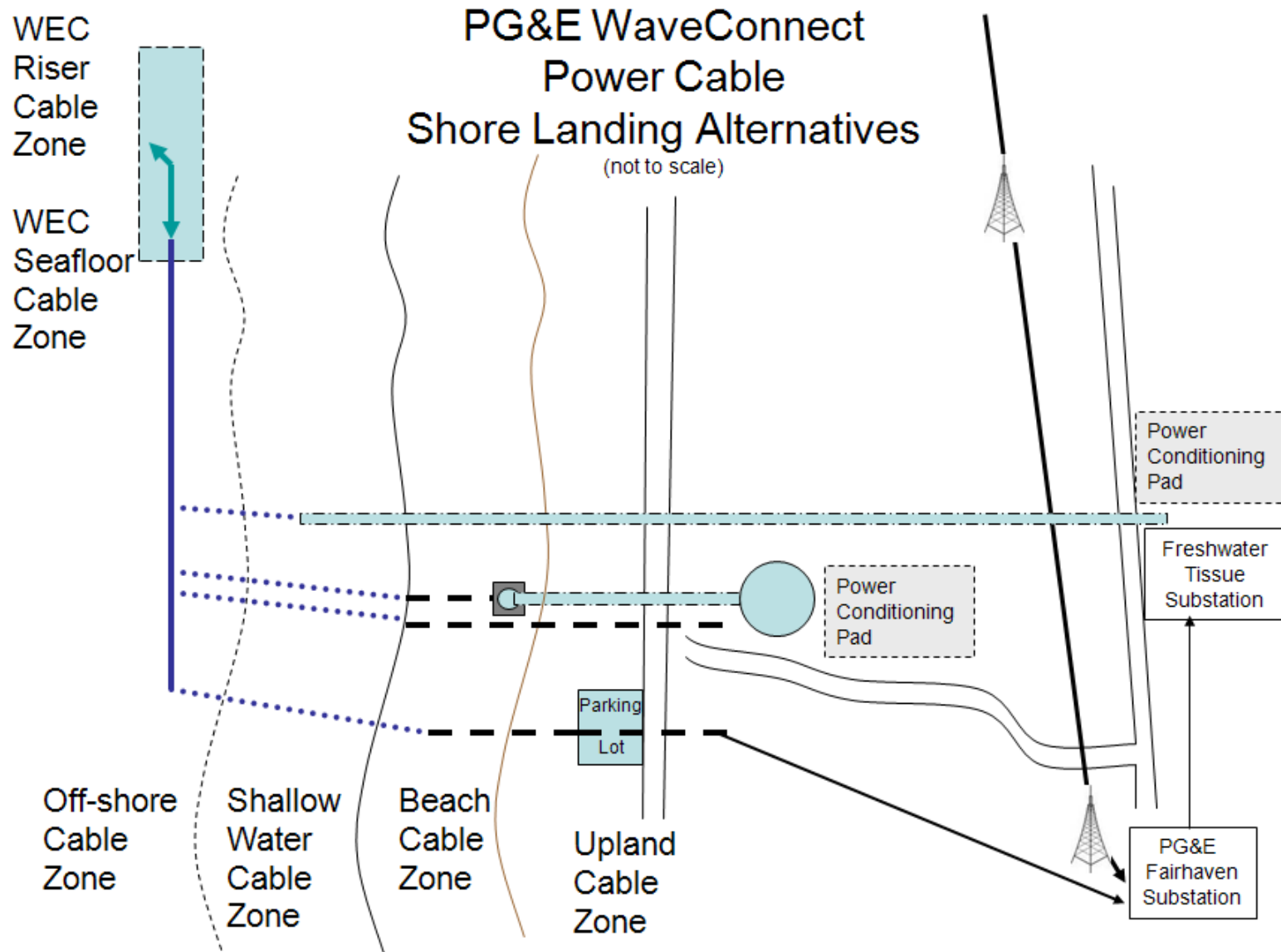
## November/December

- Wave Modeling
- Wave Energy
- O&M
- Hardware in the Sea, Artificial Reef Habitat
- Lessons Learned

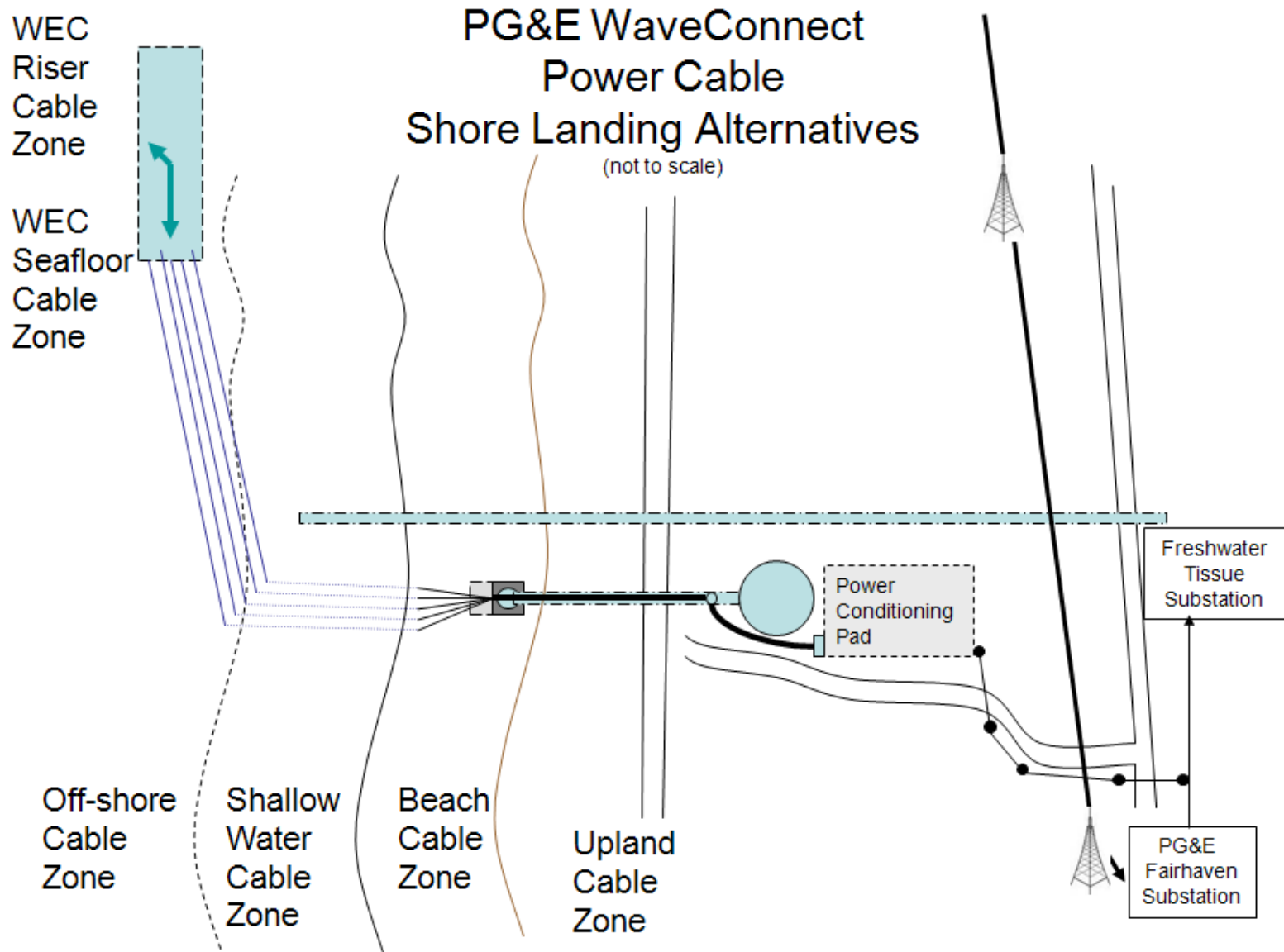
## January/February

- Technology (presented by manufacturers)
- Underwater Noise
- Security Systems
- Fishing Gear Entanglement
- Whales and Juvenile Salmon (migration patterns)

# Shore Landing Diagram



# Shore Landing Diagram



# MarineMap

<http://marinemap.org/>



# Next Steps

