

Prevention First 2014

High Energy Seismic Surveys Offshore of California's Nuclear Power Plants

The background image shows a coastal scene with a nuclear power plant. Two large, white, dome-shaped containment domes are visible on a hillside. The plant is situated near a rocky coastline with waves crashing against the shore. The sky is blue with some light clouds. The text "High Energy Seismic Surveys Offshore of California's Nuclear Power Plants – Permitting Challenges and Lessons Learned" is overlaid in a large, blue, bold, sans-serif font with a white outline.

# High Energy Seismic Surveys Offshore of California's Nuclear Power Plants – Permitting Challenges and Lessons Learned

## Presentation Overview

- Background and Objectives
  - Proposed Offshore Seismic Imaging Project
  - Federal, State and Local Agency Requirements
  - CEQA/NEPA Process Overview
  - Key Permitting Agency Issues and Process
  - Final Outcome
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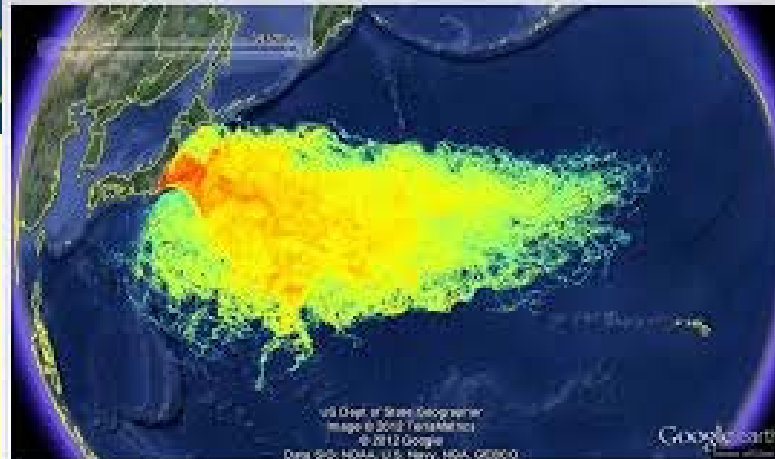
# Legislative History

- 2006 California Assembly Bill (AB) 1632 (Blakeslee)
  - 2007 Japan's KKR earthquake; 21-month nuclear plant outage
  - 2008 USGS & PG&E discover Shoreline fault near Diablo Canyon (DCPP)
  - 2008 CEC recommends 3D seismic reflection mapping at DCPP & SONGS
  - 2009 CPUC & CEC direct PG&E to perform studies before seeking license renewal
  - 2009 AB 42 – required 3D seismic surveys; governor's veto says bill not necessary because happening anyway
  - 2010 CCC directs PG&E to submit any 3D studies that may be performed before it will process CDP & consistency certification for license renewal
  - 2010 CPUC approves PG&E's application to conduct 3D studies and creates Independent Peer Review Panel (IPRP)
  - 2011 Fukushima Daiichi Nuclear Disaster
  - 2011 PG&E submits application for geophysical survey permit (GSP) to State Lands Commission (SLC)
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# Fukushima



Radioactive Seawater Impact



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# Project Location



# Project Components

- Onshore and Offshore Low Energy Surveys
  - Ocean Bottom Seismometer Array (OBS)
  - Offshore High Energy Seismic Survey (HESS)
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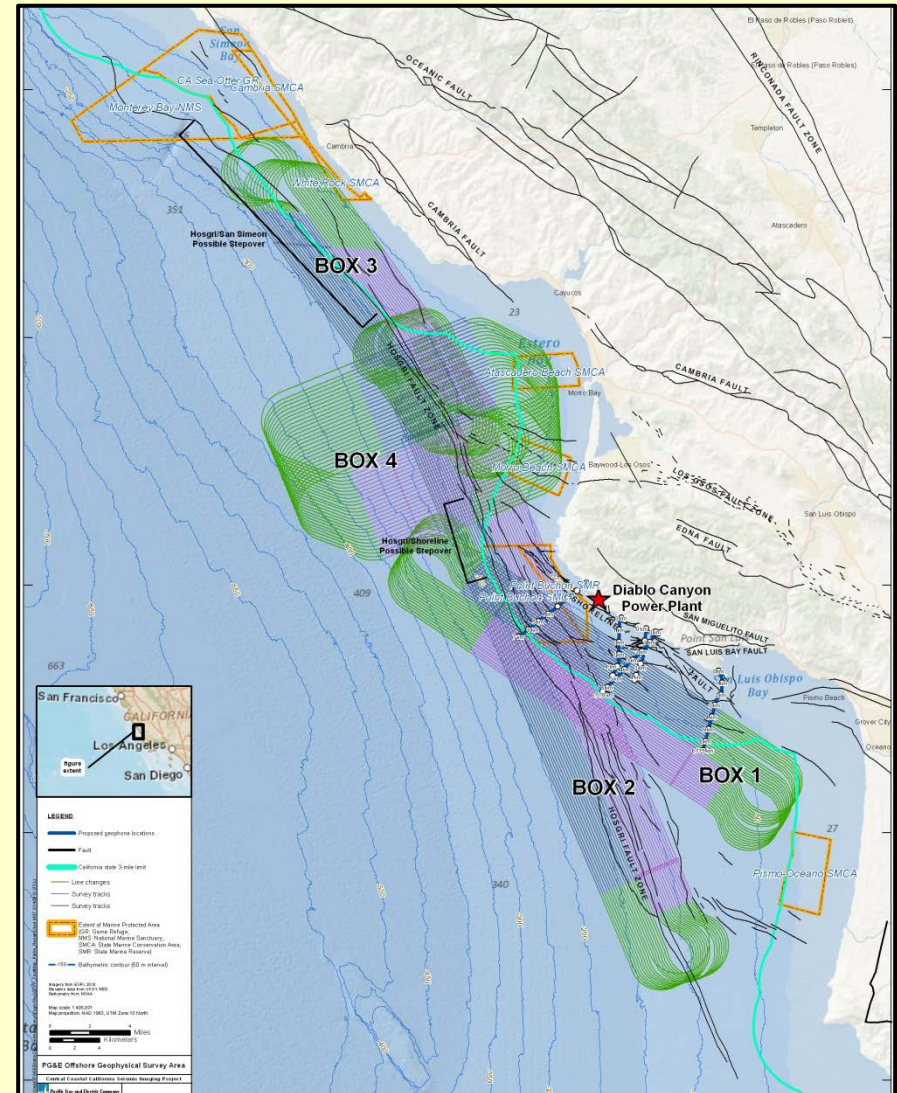
# Offshore Seismic Imaging Survey

- Cambria to Point San Luis in water up to 1,400 ft.
- Specialized survey vessel approximately 235 ft in length
- Two strings of tuned air guns with a volume of 3,300 in<sup>3</sup>
- Vessel-towed hydrophone streamer array of 3.7 miles in length
- Additional scout and support vessels
- Scheduled for September through December 2012



# Original Survey Track Lines

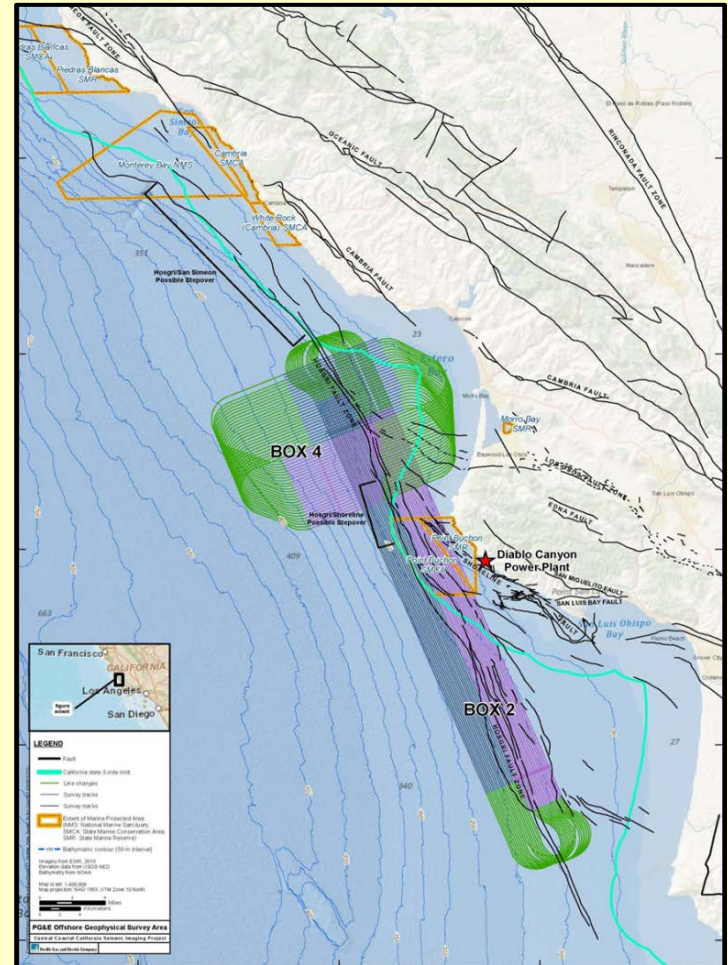
- Within 25 meter depth
- 82-days
- Actual survey duration is 42 days



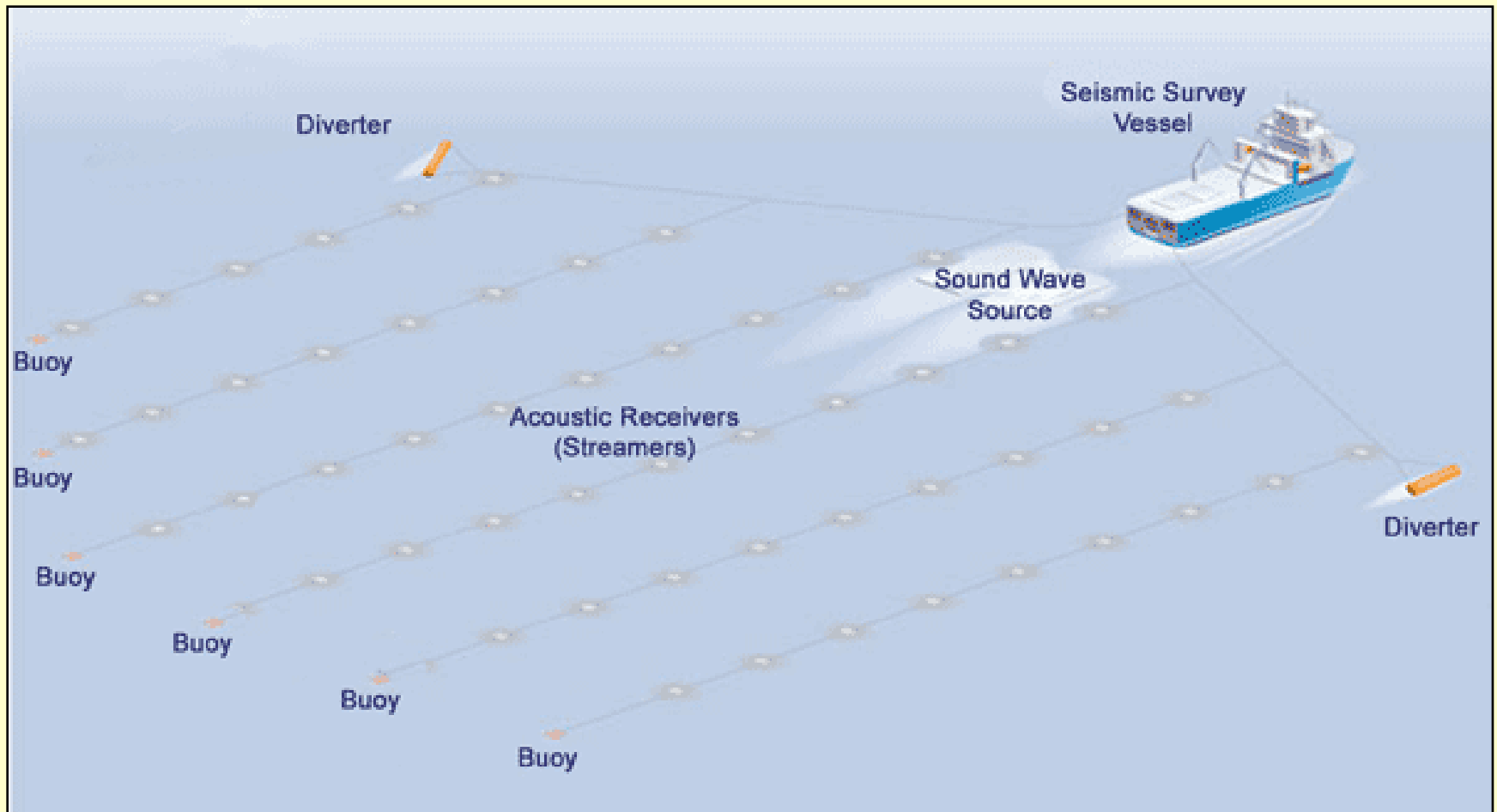


# Offshore Survey Racetrack - 2012

- Boxes 4 and 2 only (Box 1 in 2013)
- November – December (no seismic activity in October)
- 49-day survey operation (reduced from 68 days) of which only 23.25 day of seismic activity



# Towed Air Gun Array and Acoustic Streamers



# Offshore Survey Procedures

- Marine Wildlife Contingency Plan approved by NOAA Fisheries/USFWS as part of the IHA approval process
    - Procedures consistent with HESS Protocols, NSF FEIS, and NOAA Fisheries Guidance.
    - Pre-activity aerial surveys and equipment noise level testing
    - Established Safety (160 db) and Exclusion Zones (180 db) as approved by NOAA
    - Ramp-up of all air guns
    - Mitigation air gun on during all turns and temporary shut-downs
    - Passive Acoustic Monitoring (PAM)
    - Marine mammal monitors onboard all survey vessels and if necessary aircraft
    - Local commercial fishing vessels used to support operations
    - Scheduled to coincide with low marine mammal activity (late fall/early winter)
  - Notification to mariners and commercial fishers
  - Avoidance of sensitive resource areas to extent feasible
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# Anticipated Agency Approvals

- California State Lands Commission
    - Geophysical Permit (Seismic Survey)
    - California Environmental Quality Act (CEQA) Lead Agency
  - NOAA Fisheries
    - Incidental Harassment Authorization (IHA)
    - Endangered Species Act (ESA) Consultation
  - National Science Foundation
    - Contract Approval
    - National Environmental Policy Act (NEPA) Lead
  - Army Corps of Engineers
    - Section 404 Certification (NWP 5)
  - U.S. Fish and Wildlife Service (FWS)
    - Incidental Harassment Authorization (IHA) - (Sea Otter)
    - ESA Consultation
  - California Coastal Commission
    - Coastal Development Permit (CDP)
    - Federal Consistency
  - California Department of Fish & Game – MPA Authorization
  - California Dept. of Parks and Recreation – Encroachment Permit
  - County of San Luis Obispo – Encroachment Permit
  - U.S. Coast Guard – Notice to Mariners
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# Incidental Take Authorization

- NOAA Fisheries and US Fish and Wildlife Service
    - Marine Mammal Protection Act of 1971 (MMPA)
  - Endangered Species Act (ESA)
  - Harassment aka “take” of Marine Mammals
  - Incidental Take Authorization or Letter of Authorization
  - Section 7 versus Section 10 Consultation Process
  - Requires completion of NEPA Process and Federal Consistency Determination
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# Marine Geophysical Permit

- Issued by the California State Lands Commission
  - High Energy Seismic Surveys have been prohibited in State Waters since early 1990's
  - Requires completion of an Environmental Impact Report (CEQA)
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# Coastal Development Permit/Federal Consistency Certification

- Issued by the California Coastal Commission
  - Projects must comply with the State's Approved Coastal Plan
  - Prohibits project approvals by either State or Federal agencies without mitigation for all potential significant impacts
  - Stated opposition to high energy sources in the marine environment.
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# Project Approval Schedule

Action	Date
Submission of Project Application to CSLC	April 29, 2011
Release of Draft EIR by CSLC	March 16, 2012
Draft EIR Public Workshops	April 19, 2012
Final EIR and CSLC Approval Hearing	August 20, 2012

## National Environmental Policy Act (NEPA)

- Required when a project has the potential to impact the natural and manmade environment
  - Lead Agency was the National Science Foundation
  - Determined due to the fact they would be taking the first discretionary action on the project (approval of use of federal property)
  - Environmental Assessment (EA)
  - Keys on interagency consultations
    - ESA
    - Essential Fish Habitat
    - Section 106
    - Clean Air Act
    - Clean Water Act
-

# Federal NEPA Review Timeline (2012)

- April 16 – May 31: State/Federal Agency Coordination
- June 1 – June 22: Prepare Draft Environmental Assessment (DEA) which:
  - Incorporates, and tiers from, NSF PEIS
  - Incorporates CSLC DEIR information to the extent practicable/feasible/agreeable
  - Reflects new agreements with California State agencies regarding monitoring/mitigation measures
- June 25 – July 25: Release DEA for 30 day public comment period
- July 25 – August 1: Prepare responses to public comments
- August 1: Release Final EA
- August 1 – 31: Agency 30-day cooling off period
- September 1: Record of Agency Decision (assuming coincides with IHA/ESA processes)



## Monitoring Programs/Bond

- IHA/MWCP Monitoring Program
  - Harbor Porpoise Monitoring Program
  - Sea Otter Monitoring Program
  - Aerial Surveys conducted by NMFS
  - Adaptive Management Program
  - Stranding Response Plan
  - CSLC Mitigation Monitoring Plan
  - Fish and Invertebrate Monitoring Program
  - Fisheries Notifications
  - \$5 million Bond for Geophysical Survey Permit
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# Sound Level Predictions and Mitigations

- Southall vs. NMFS Methodology
  - Level A vs. Level B Take
  - 1.2-mile Exclusion Zone
  - Undefined Safety Zone
  - Aerial Surveys 10 days in advance
  - Weekly Aerial Surveys
  - 3 Shutdowns - Reconsultation
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# Comparison of Exclusion Zones

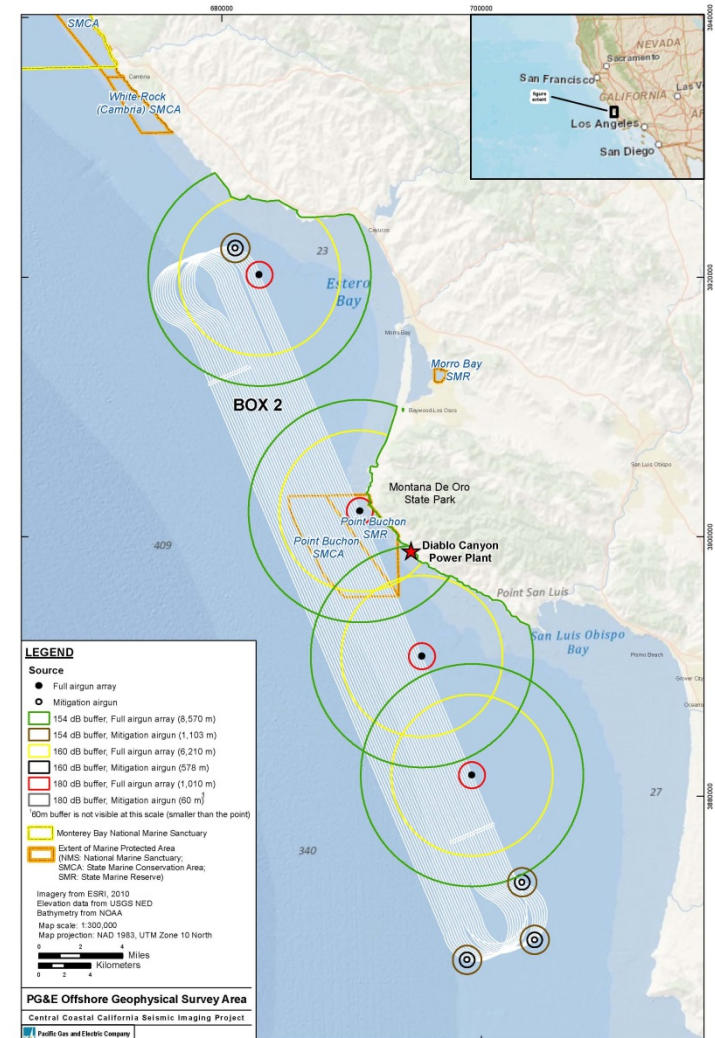
Comparison of Distances to the 180 dB SEL  
(meters/statute miles)

PG&E IHA Application	Previous Columbia IHA Approvals	CSLC EIR Noise Modeling	EIR Mitigation Measure
1,010 / 0.6	852 / 0.5	856 / 0.5	1,931 / 1.2
Greeneridge Sciences, Inc. modeling for upslope transect	Diebold, et al. (2010) for intermediate depth water (100 to 1,000 m)	JASCO modeling for EIR (Range of R <sub>95%</sub> for Site 1)	

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# Safety and Exclusion Zones



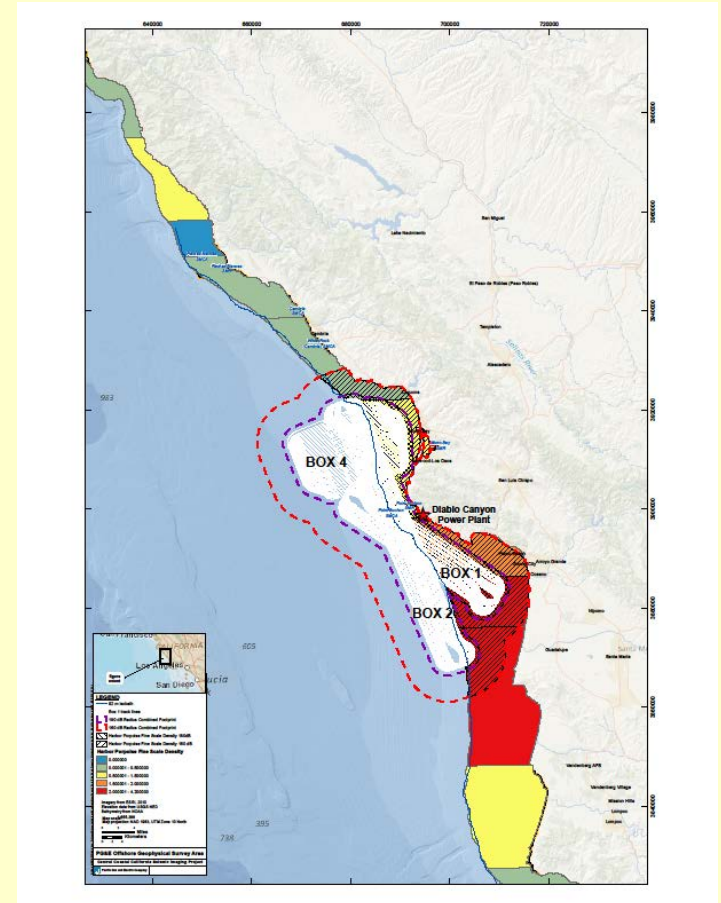
## Monitoring of Impacts to Fish/Invertebrates

- Monitoring of short- and long-term impacts to fish and invertebrates
    - Short-Term Effects: ROV High definition video of demersal fishes, invertebrates, and seafloor habitat
    - Long-Term Effects: California Collaborative Fisheries Research Program
    - Before-After/Control-Impact (BACI) Study Design
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# Harbor Porpoise Monitoring Program

- Morro Bay Stock impacts determined to be greater than incidental
- NOAA Fisheries unable to approve IHA without significant mitigation program
- Monitoring included extensive aerial and acoustic surveys



## Sea Otter

- Endangered under ESA and Protected under the MMPA
- Incidental Take Permit Required by USFWS
- No documented impacts from marine seismic operations
- Monitoring Program Required by USFWS



# Denial

- On November 14, 2012 the California Coastal Commission Denied the CDP and Objected to the Federal Consistency Request



## Reason for Denial

- Inability to effectively detect marine wildlife within the Exclusion and Safety Zones
  - Believe a Level A Take will Result from Project
  - PG&E did not effectively demonstrate a need for the project that would result in an Override of the Coastal Act Requirements
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## Results of the Denial

- Due to restrictive timing and availability of the RV Langseth, PG&E had initiated mobilization of vessel to survey area.
  - Vessel returned to the Atlantic Coast
  - Currently no available HESS vessels available on the West Coast
  - PG&E suspended all HESS activities and have focused on interpretation of existing data.
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# Question/Answer Session

