Feasibility Studies for Hydrokinetic Energy in California

Cordel Stillman
Deputy Chief Engineer
Project History

• November 2007
• Board of Supervisors Directed SCWA to Investigate Wave Energy

• July 7, 2009
• FERC Approves 3 Preliminary Permits

• July 6, 2012
• Preliminary Permits Expire
Project Locations

Project Maps Are Not To Scale

Del Mar Landing
Proj. #13376-000

Fort Ross (North)
Proj. #13378-000

Fort Ross (South)
Proj. #13377-000
Advisory Committee

• Members Include:
  – Mendocino & Sonoma Counties
  – PG&E
  – US Geological Services
  – UC Davis Bodega Marine Lab
  – Pacific Coast Federation of Fishermen
  – Surfrider Foundation
  – California Coastal Commission
  – NOAA
  – More...
Emerging Technologies

- Magnetic Generator Buoy
- Point Absorber
- Pelamis Wave Power Converter
- Other Technologies
Oregon State University Conceptual Wave Park

- Magnetic Shaft anchored to sea floor
- Electric Coil secured to heaving buoy
- Permanent Magnet Linear Generator Buoy

1-2 miles offshore
Full Scale Pelamis
Issues to be Considered

- Environmental Impacts
- Aesthetic Impacts
- Economic Impacts
- Power Transmission
- Cost
Fisheries Issues

• Environmental
  – Habitat Conversion
  – EMFs
  – Noise
  – Entanglement

• Fishing
  – Restricted Access (de-facto reserve)
  – MLPA Cumulative Impacts
Federal Agencies & Entities

• Federal
  – Bureau of Land Management
  – Federal Energy Regulatory Commission (FERC)
  – National Environmental Protection Agency (NEPA)
  – National Marine Fisheries Service
  – National Marine Sanctuaries
  – National Oceanic Atmospheric Administration (NOAA)
  – U.S. Army Corps of Engineers
  – U.S. Coast Guard
  – U.S. Department of Energy
  – U.S. Fish & Wildlife Services
State Agencies & Entities

• State
  – California Coastal Commission
  – California Coastal Conservancy
  – California Department of Fish & Game
  – California Energy Commission
  – California Environmental Quality Act (CEQA)
  – California Marine Life Protection Act
  – California Ocean Protection Council
  – California Office of Historic Preservation
  – California Public Utilities Commission
  – California State Lands Commission
  – Central & Northern California Observing System
  – North Coast Regional Water Quality Control Board
Closing Remarks

- Regulations
  - Many Agencies and Entities
- Funding
  - Marine Research Expensive
- FERC Process
  - 3-Year Permit Not Enough Time
Feasibility Studies for Hydrokinetic Energy in California

Cordel Stillman
Deputy Chief Engineer
Cordel.Stillman@scwa.ca.gov