NOAA’s Monterey Bay National Marine Sanctuary

- Designated: 1992
- Area: 6094 square statute miles
- Shoreline Length: 276 miles
- Deepest point ~ 12,000 feet
- Supports one of the world’s most diverse marine ecosystems
Our Living Marine Resources

Fish: 345 species

Marine algae: 450 species
Invertebrates: 3,000+ species

Marine Mammals: 33 species

Turtles: 4 species

Seabirds: 94 species
Diverse Coastal and Marine Habitats

Rocky Shoreline

Sloughs

Kelp Forest
Human Elements of MBNMS

- Five Coastal Counties
- 12 Coastal Cities
- Four Urban Centers
- Six Congressional Districts
- Approx. 9 million within 25 mi.
Resource Protections - prohibitions

- Exploring for gas, minerals
- Discharge or deposit of any material
- Moving, removing, or injuring a Sanctuary historical resource
- Altering the seabed
- Disturbing marine mammals, sea turtles, or marine birds
- Flying motorized aircraft below 1000 feet in certain areas
- Operating motorized personal watercraft, except within the four designated zones
- Interfering with enforcement of Sanctuary laws or regulations
- Attracting white sharks
- Release of invasive species within or into the NMS
State and Regional Desalination Trends

- Increased interest in desalination in State of California and the MBNMS area

- Currently more than 20 proposed plants in CA

- Many of these proposed plants are within the MBNMS region
Existing Monterey Bay Plants

- Moss Landing Power Plant
- Sand City
- Monterey Bay Aquarium
Numerous Proposed Desalination Plants

- City of Santa Cruz
- Monterey Regional Desalination Project
- DeepWater Desal
- Monterey Peninsula Water Management District
- Ocean View Plaza
- Cambria
Overview of Negative Impacts

• Impacts are highly variable from site to site; cannot generalize

• Primary negative impacts include:
  ✓ construction
  ✓ intake and discharge
  ✓ energy use and emissions
  ✓ land use
  ✓ socioeconomic impacts

• Impacts can be mitigated through proper site design and operation
Positive Impacts of Desalination

- Water supply augmentation
- Reclamation of impaired sources
- Drought resistant reliable water supply
- Diversification of water supply options
- Provides high quality drinking water free of contaminants
- Potential future environmental benefits
MBNMS Desalination Involvement

- Regulatory/Permitting
- Joint Management Plan Review—Desalination Action Plan
- Commenting on desalination proposals
- Public education—Workshops/conferences
- Multi-Agency partnerships
- MBNMS Desalination Guidelines
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Relevant Sanctuary Regulations

- It is unlawful for any person to discharge or deposit any material; or other matter except:

- It is unlawful to discharge or deposit from beyond the boundary of the Sanctuary any material or other matter that subsequently enters the Sanctuary.

- It is unlawful to drill into dredge, or otherwise alter the seabed, or construct, place, or abandon any structure, material or other matter on the seabed.
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JMPR Priority Issues--MBNMS

- Administration
- Big Sur Coastal Ecosystem Coordination
- Coastal Development
  1. Coastal armoring
  2. Desalination
  3. Dredge disposal
  4. Submerged cables
- Ecosystem Protection
  1. Benthic habitats
  2. Davidson Seamount
  3. Emerging issues
  4. Fishing Research and Education
  5. Krill harvesting
  6. Marine reserves
- Interpretive Facilities
- Exotic Species
- Multicultural Outreach
- Water Quality
  1. Beach closures
  2. Protect riparian habitat
  3. Revise MOA
  4. WQPP Implementation
- Wildlife Disturbance
  1. Tidepool protection
  2. Marine mammal disturbance
  3. Motorized Personal Watercraft
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Regulatory Agencies Involved

Federal:
- Army Corps. Of Engineers
- US Coast Guard
- National Marine Fisheries Service
- US Fish and Wildlife Service
- Monterey Bay National Marine Sanctuary

State:
- California Coastal Commission
- Dept. of Fish and Game
- Department of Health Services
- Dept. of Transportation
- Dept. of Water Resources
- Public Utilities Commission
- State Lands Commission
- State and Regional Water Boards

Local & Regional:
- City governments
- County government
- Water management districts
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MBNMS Desalination Guidelines

**Background:** These Guidelines were developed to help ensure that any future desalination plants in the sanctuary will be properly sited, designed, and operated in a manner that results in minimal impacts to the marine environment.

- Based on a non-regulatory collaborative approach
- Address numerous issues including:
  - site selection
  - construction and operational impacts
  - plant discharges, and intake systems.

- Intended to assist regulatory agencies in reviewing proposals and ensure that project resource protection concerns are addressed.
**MBNMS Desalination Guidelines**

**Development of Guidelines**

- Multi-agency Collaborative Process—MBNMS, Coastal Commission, RWQCB, NMFS

- Based on science established in AMBAG/MBNMS study

- Input and review by numerous stakeholders
Desalination Guideline Categories

Guidelines For:
- Regional Desalination Approach
- Desalination Alternatives and Need
- Plant Site Selection and Structural and Engineering Considerations
Desalination Guideline Categories

Environmental Impacts Guidelines:

- Guidelines Regarding Cumulative Impacts
- Entrainment and Impingement
- Brine Discharge
- Energy Use and Greenhouse Gas Emissions
- Co-location with Power Plant
- Co-location with Sewage Treatment Facilities
- Chemicals for Treatment and Cleaning
- Other Environmental and Socioeconomic Impacts
- Guidelines for Desalination Plant Construction Phase
Desalination Guideline Categories

Monitoring Guidelines: Develop/implement a monitoring program focused on:

- Developing a statistically acceptable baseline for project area

- Monitoring source water for potential contaminants

- Monitoring effluent prior to discharge

- Monitoring effects of effluent on marine organisms within the plume

- Monitoring impingement/entrainment effects, if applicable

- Monitoring any required mitigation for unavoidable impacts
Existing Monterey Bay Plants

- Moss Landing Power Plant
- Marina Coast Water District
- Monterey Bay Aquarium
Sand City Water Supply Project

✓ 0.4 MGD RO plant was approved in 2005

✓ Beach well from brackish water aquifer beneath beach for intake

✓ Horizontal beach well for brine discharge

✓ To be operated by CalAm

✓ Proposals now being sought for plant design, engineering, and construction
Proposed Plants

✓ **Santa Cruz/Soquel Creek WD**
✓ **Monterey Regional Water Project**
✓ **Deep Water Desal**
✓ **Monterey Peninsula Water Management District**
✓ **Ocean View Plaza**
✓ **Cambria**
Santa Cruz/Soquel Creek Water Districts

- EIR has been certified by City
- 2.5 MGD Desal plant proposal in response to drought shortages
- Would retrofit unused pipeline for intake
- Collaboration with Soquel Creek Water District
- Pilot plant operated for 1+ year
- Entrainment and discharge studies underway
Regional Water Project

- Desal proposed in response to State Order 95-10
- The Regional Project will desalinate brackish water from an intruded groundwater aquifer instead of taking seawater directly from the ocean.
- Product water conveyed to cities of the Monterey Peninsula
- HDD wells for intake
- EIR Released 2/09
- Brine/effluent to be discharged to the MRWPCA outfall
- Plant to be located on property owned by MCWD
- Project to be overseen by an Advisory Committee
Deep Water Desalination

- Proposal for 20 MGD RO plant at Moss Landing
- Water would go to north Monterey County residents
- Joint Powers Authority (“JPA”) structure
- Would use rebuilt pier in Moss Landing for intake/outfall
- Intake would be located below photic zone (in 70-80’ of water)
- Preliminary proposal. Considering 10,000 or 20,000 acre feet per year
MPWMD Desalination Project

- 2 MGD RO plant (2,000 AF/yr)
- Beach wells or open ocean intake
Ocean View Plaza

✓ Proposed mixed use development on Cannery Row
✓ 0.05 MGD RO plant proposed for development’s water supply
✓ Sub-surface water intake/discharge off Cannery Row
✓ Community Services District formed
✓ Currently RWQCB Permit is being appealed
Cambria

✓ Desal under consideration since 1993

✓ In response to serious drought issues and MTBE contamination of wells

✓ 580 Acre-feet per year desalination plant proposed

✓ Subsurface intake and discharge being evaluated

✓ Plant would be operated only during certain conditions

✓ Water would not go to new development
Essential Underlying Policy Considerations

- Site-specific—requires case-by-case review
- Precautionary approach is essential
- Early and thorough involvement and collaboration between regulators and proponents and stakeholders
- Approach must be adaptable
What Questions Should Policymakers Ask?

- Is desalination necessary/appropriate, or are there better alternatives available?
- Where will the desalinated water go?
What site-specifics conditions exist with the project?

- Plant capacity (small vs. large)
- Siting considerations
- Technology and design aspects
- Visual, recreational, and coastal access issues
- Huge variety of site-specific considerations
What are the Environmental Impacts of Project?

- Impacts Vary widely
- Construction impacts
- Impacts from brine discharge
- Impacts from seawater intake
- Cumulative impacts
- Growth inducing impacts
More Considerations for Policymakers

- What are the Socio-economic Impacts?
- What are the human health and safety concerns?
Intake and Discharge Impacts

- Brine Discharge
- Impingement
- Entrainment
Construction Impacts

- Similar issues to any other coastal development projects
- Potential impacts to seafloor, surf zone, and beach/dune ecology
- Wildlife disturbance
- Surface water quality degradation
- Impacts to recreational and commercial activities
- Impacts mitigated by using *Best Management Practices*
Energy Use and Emissions

- Desalination plants are energy intensive

- Desal plants will result in increased emissions which can:
  - impact human health and the environment
  - contribute to global climate change

- Mitigation measures include use of renewable energies, tradeoffs, and use of energy saving technologies and practices
## Growth Inducing Impacts

- Desalination plants have the potential to induce growth in the Monterey Bay area by:
  - removing an obstacle to growth
  - adding a new water supply

- Can strain existing community services and infrastructure

- Can cause indirect environmental impacts

- Significant public concern exists regarding growth inducement

- CEQA requires evaluation of growth inducement

- Desalination plant capacities should be limited by growth forecasts in local land use plans and policies
Cumulative Impacts

Defined by CEQA as:
“an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts”

- Includes environmental impacts, AND public access, visual, and a variety of other socioeconomic impacts.

- Includes impacts to water quality and the marine environment due to the intake and brine discharge

- More information/studies are needed
Other Impacts and Issues

- Power plant once-through cooling co-location issues
- Private vs. public ownership
- Affects on sensitive ocean monitoring efforts
- Coastal erosion and armoring
- Impacts to groundwater
- Cultural resources
- Visual impacts