SCCOOS: Integrating Regional Compliance Monitoring and Ocean Observing Systems

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What factors differentiate Southern California from other regions?

- Beach-related water quality is a high priority
- Observational resources are different from other regions
Development of Collaborative Observational Efforts

- Historical observing systems
- Evolution of NPDES efforts
- Specialized observation efforts
- Integrated ocean observing system
Historical Ocean Observing Systems in Southern California

- CalCOFI (California Cooperative Fisheries Investigations)
  - >50 years
- NOAA Buoys
- CDIP – Coastal Wave Prediction
- NPDES Permittee Monitoring (Clean Water Act)
  - Local Monitoring
  - Regional Monitoring / Assessment beginning 1994
Evolution of NPDES Regional Monitoring

- **Bight 94 (EMAP affiliation)**
  - Goal: State of the Bight
  - Municipal monitoring agencies only

- **Agency transition from independent local sampling to regionally coordinated sampling**

- **Bight 98**
  - Beginning of academic collaboration with monitoring agencies
  - Water Quality focus on Stormwater Runoff

- **Bight 03**
  - Larger role of academic involvement
  - Collaboration of SCCOOS Components to provide complementary observational tools
  - Remote sensing
  - Drifters
  - HF Radar surface current mapping
Focused Observational Programs: Specific Problem Areas

USC/SCCWRP
Santa Monica Bay
Stormwater
1996-97
(Funding: LA County, LA City, Sea Grant)

Palos Verdes
DDT Contamination
1992-93
(NOAA funded)

Huntington Beach
Bacterial Contamination
2000-2002
(Fed’l, State, County, City)

Imperial Beach
Bacterial Contamination
2000-present
(State, City)
Recent Examples of NPDES Permittee/Academic Collaborations

- Bight 98 / Bight 03 Regional Studies
Bight 98 / 03 - Significance and Dispersion of Freshwater Plumes

Dry Weather - October 1998
Bight 98/03 - Complex transport of plumes

January 1999
Offshore transport due to eddies
Combination of HF RADAR CURRENTS with OCEAN COLOR satellite data

2/5/03

Bight 98/03 - Correlation between coastal currents and runoff properties
Where do we go from here?

Southern California Coastal Ocean Observing System (SCCOOS)
Monitoring: systematic collection of mission driven environmental data to determine current conditions, trends, variation
Observing: collection of real-time environmental data for a host of uses
Research: scientific investigation and scholarly pursuit of knowledge
Education: presentation of information in a manner that people can take action
Existing agency monitoring
- surface current measurements
- satellite and aircraft remote sensing
- physical, bio-optical moorings
- autonomous vehicles
- meteorological measurements
- modeling
- distributed databases

- water quality
- marine life resources
- coastal hazards
- educators
- search and rescue
- spill response
- security
- regional marine science

Observeing infrastructure

End user needs

...the many layers of an integrated coastal observing system
Apply real-time sensors to build a system to continuously monitor the coastal ocean

- Moorings
- Instrument city piers
- Bottom mounted sensors
- HF radar
- Satellite remote sensing
- Autonomous vehicles

Couple data to existing monitoring efforts - provides framework for interpretation/understanding
Draft organization structure for SCCOOS

Board of Advisors
Ocean Science Trust

Board of Governors
Operating Board
SCCOOS Consortium Members/Working Groups

Data Provider User Groups (DPUGs)

Maritime Operations
Weather Climate
National Security

Public Health
H₂O Quality
Natural Hazards
Ecosystem Health, Restoration
Living Marine Resources
Modeled Currents and Sea Surface Temperature Fields
IMPLEMENTATION OF OCEAN CURRENT MAPPING INFRASTRUCTURE UNDER CALIFORNIA STATE PROP 40
Regional Coverage Provided by Nested Array
SITE LOCATIONS FOR HIGH RESOLUTION OCEAN CURRENT MAPPING HF RADAR WITH ~40KM RANGE

green: historical site
blue: existing UCSB
orange/yellow: existing SDCOOS
light blue: proposed new sites
Summary

- Set of observing systems already existing in Southern California
- NPDES Permittees have a significant existing observational program whose costs exceeds all other existing programs
- History of collaboration between the municipal agencies and the academic community
- Implementation of new observing systems that:
  - Complement existing observing programs
  - Provide understanding / interpretation not available from previous observations
- Development of integrated products to serve the user community
User Issues for SCCOOS

- **Water Quality / Public Health**
- **Living Resources**
  - Fisheries Management
  - Marine Protected Areas
  - Harmful Algal Blooms
- **Shipping and Transportation**
- **Oil Spills / Search and Rescue**
- **Beach Dynamics / Sediment Transport**
- **National Security**
Southern California Monitoring Expenditures - Year 1997

Fed'I $3.15M
State $0.55M
Local $1.27M
NPDES $24.00M
Private $0.39M
University $1.88M

Total: $31.3M