

# Channel Islands National Marine Sanctuary

## Science-based Decision Support Protocols

### Management Issue

In spite of intense and long standing research and monitoring activities within the Channel Islands National Marine Sanctuary (CINMS or Sanctuary), there are no objective, testable and reliable methods or decision support models to convert complex monitoring data into assessments of resource status for use by managers.

### Description

In reviewing the evaluation process used by regional experts in composing the 2008 CINMS Condition Report for the Sanctuary it was apparent that in spite of all the monitoring historically and currently occurring in the Sanctuary there is no objective process to convert the amassed data into assessments of resource status. For example, in answering nine out of 14 questions about water quality, habitat condition and living marine resource status, contributors relied on their judgment in developing assessments 100% of the time. In none of those cases was an established benchmark or

decision support model used to translate the available data into an assessment that could be used by managers as science-based support for management decisions. As the CINMS Advisory Council's Research Activities Panel pointed out in the review process, the systemic problem in the CINMS Condition Report is "no articulated decision support model or benchmark for performance. To the extent that the rating scheme is subjective, it should not be used as scientific support for management decisions." Therefore, there is a need established for the introduction of a research program that assembles the available information and then creates objective, testable linkages between information in order to develop overarching indicators of resource status. In many cases these relationships between indicators are not well enough understood to develop low-dimension assessments (i.e. good vs. fair vs. poor) of the status of an ecosystem that is complex and dynamic. Thus this need can only be addressed by a synthesis of available data and model of ecosystem process, likely supported by targeted, experimental field actions.

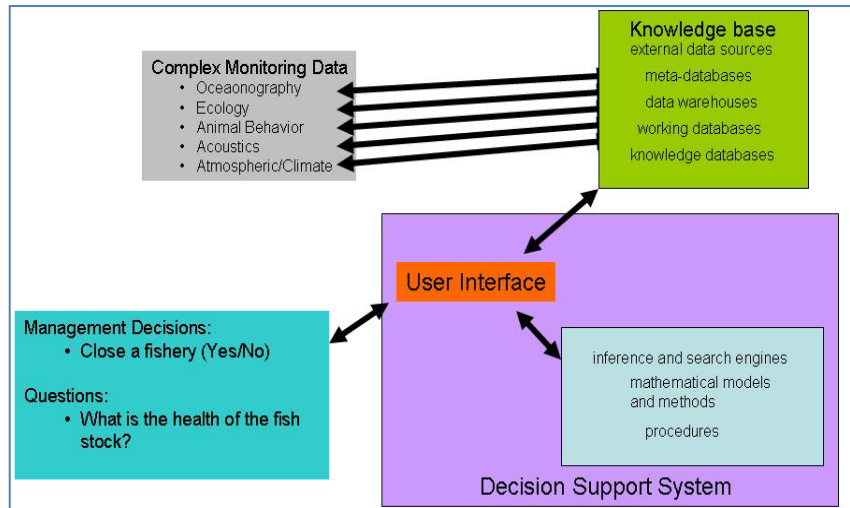


Figure 1. Decision Support Systems (DSS) have a user interface that operates within a discrete management decision context, and which reaches out in an automated manner to obtain the appropriate data and input that to the models and methods that produce the objective answers.

### Questions and Information Needs

- 1) What are all the decisions made by the diverse managers whose jurisdictions overlap the Sanctuary?
- 2) What are all the questions that must be answered for each of those decisions to be made?
- 3) What conceptual measures of resource health (i.e. "resilience", "reactance", "diversity") constitute answers to those questions?
- 4) What monitoring data (i.e. time series of species counts), and how are they assembled (diversity index, IBI, dominant eigenvalue of community interaction matrix) to express those conceptual measures of resource health or status?

Current as of 11/28/12

For More Information -- <http://www.sanctuaries.noaa.gov/science/assessment>

## Scientific Approach and Actions

- Perform decision requirements assessment – survey of decision makers on their list of management decisions and questions
- Review the history of management decisions in and around the Sanctuary
- Review history of research efforts to develop conceptual measures of resource health
- Deploy pilot measures that assemble available data in tests of trial indicators and model assessments
- Review performance of test indicators on regular schedule to adaptively develop indicators that managers can actually use

## Key Partners and Information Sources

CDFG, NMFS, the University of California at Santa Barbara and Los Angeles (UCSB & UCLA), the National Center for Ecological Analysis and Synthesis (NCEAS), other resource management agencies who are developing parallel decision support tools (e.g. US EPA, US Forest Service), and the regional Air Quality Management Districts



*Decision support protocols will use data collected in the field to inform models that will help management make decisions. Photo credit: Jessie Alstatt*

## Management Support Products

- Concise and relevant monitoring data to support assessments of resource status in the Sanctuary
- Appropriate decision support models for management decisions
- Reduction in guesswork as an assessment method

## Planned Use of Products and Actions

- Tested, objective, science-based tools that inject available monitoring data and output answers to the questions that need to be answered to make management decisions in the Sanctuary

## Program References

### CINMS Management Plan

- Conservation Science Action Plan - CS.2
- Marine Reserve Monitoring - CS.2
- Comprehensive Data Management - CS.6
- Biological Monitoring of MPA Network – CS.6

### CINMS Condition Report

- This work is critical to the effective completion of documents like the condition report.

### ONMS Performance Measures

- Number of sites in which water quality, based on long-term monitoring data, is being maintained or improved
- Number of sites in which habitat, based on long-term monitoring data, is being maintained or improved
- Number of sites in which select living marine resources, based on long-term monitoring data, are being maintained or improved

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