

National Marine Sanctuaries
National Oceanic and Atmospheric Administration



NATIONAL MARINE
SANCTUARIES



Applying the DPSER Framework

An Ecosystem Services Case Study to Channel Islands National Marine Sanctuary

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Outline

- National Marine Sanctuaries
- DPSEER Framework
- Application to Channel Islands National Marine Sanctuary
 - Process
 - Final Products
 - How its used

National Marine Sanctuaries



Condition Reports



Condition Reports - History

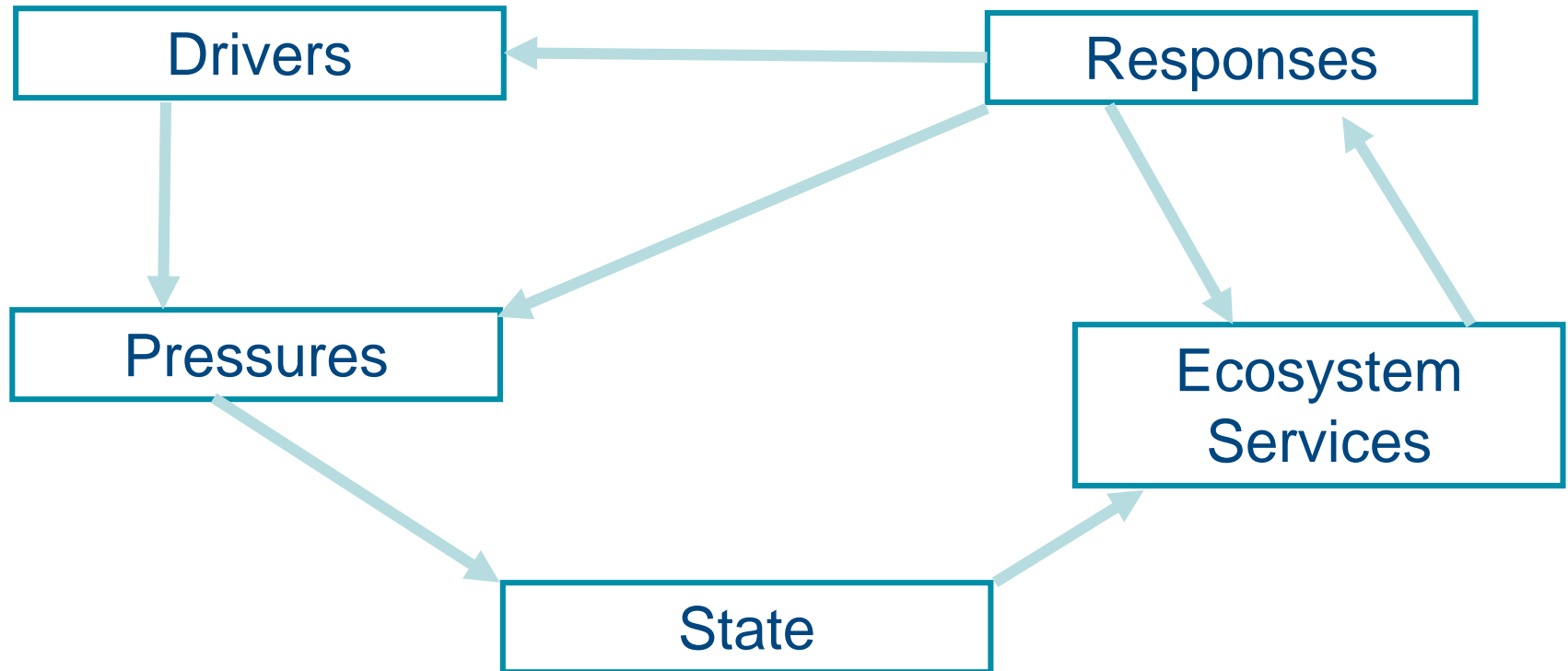
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Tre

▲ ()
- C ()
▼ ()
? U ()
N/A ()

	Questions/ Resources	Rating	Basis For Judgement	Description Findings	Undet.
	WATER				
1.	Are specific or multiple stressors, including changing oceanographic and atmospheric conditions, affecting water quality and how are they changing?	?	Distance from the mainland and regulations limit impacts; sampling generally indicates water quality is better at the islands than the mainland. However, there is concern about an apparent increase in the frequency and extent of diatom blooms. Also, the effects of ocean acidification, although not currently well understood, are expected to have significant impacts.	Selected conditions may preclude full development of living resource assemblages and habitats, but are not likely to cause substantial or persistent declines.	

DPSEER



DPSER - Drivers



DP_{SER} - Pressures



DP^SER - State



▲ = Improving — = Not changing ▼ = Declining
? = Undetermined trend N/A = Question not applicable



DPSER – Ecosystem Services

Cultural

1. Sense of Place
2. Tourism & Recreation
3. Science and Education
4. Heritage



DPSER – Ecosystem Services

Provisioning

1. Food
2. Ornamentals
3. Biotechnology
4. Energy



DPSER – Ecosystem Services

Regulating

1. Clean Water
2. Coastal Protection
3. Climate Stability



DPSE^R - Response



Application of DPSER to Channel Islands National Marine Sanctuary



Channel Islands



Expert Panels in DPSEER Application

- Discuss state of resources with experts
- Compile notes/results
- Research ecosystem services
- Meet with experts to discuss the state of ecosystem services
- Finalize results

State Status Expert Meeting Process

For each question:

1. Review basis for previous status and trend
2. Review new information available for indicators in each habitat
3. Discuss if new information indicates a change in status or trend.
4. Finalize current status and trends
5. Rate level of evidence, level of agreement, and confidence in current status and trend

Ecosystem Services

Cultural

1. Sense of Place
2. Tourism & Recreation
3. Science and Education
4. Heritage

Provisioning

5. Food
6. Ornamentals
7. Biotechnology
8. Energy

Regulating

9. Clean Water
10. Coastal Protection
11. Climate Stability

Ecosystem Services

Step 1

Ecological Attribute	Ecosystem Service						
	Recreation Non-Consumptive	Recreation Consumptive	Food Supply - Commercial	Sense of Place/ Aesthetics	Cultural/ Heritage	Science/ Research	Education
Water Quality	X	X	X	X	?	X	X
Water Clarity	X				?	X	X
Abundance of Fish for Consumptive Use		X	X		?	X	X
Abundance & Diversity of Fish for Wildlife Viewing	X			X	?	X	X
Abundance & Diversity of Birds for Wildlife Viewing	X			X	?	X	X
Abundance & Diversity of Whales for Wildlife Viewing	X			X	?	X	X

Ecosystem Services

Step 2

Ecological Attribute	Ecological Indicators/ Evidence	Reference	Name
Water Quality			
Water Clarity			
Abundance of Fish for Consumptive Use			
Abundance & Diversity of Fish for Wildlife Viewing			
Abundance & Diversity of Birds for Wildlife Viewing			
Abundance & Diversity of Whales for Wildlife Viewing			

Ecological Attribute	Ecological Indicators/ Evidence
Water Quality	Nutrient Counts
	PCB levels
	Temperature

Ecosystem Services

Step 2

Ecosystem Service	Economic Indicators	Reference	Non-Economic Indicators	Reference	Name
Recreation					
Wildlife Viewing					
Scuba Diving					
Hiking/Biking					
Boating					
Food Supply					
Commercial					
Recreational					
Science/Research					
Education					
Cultural/Heritage					
Sense of Place/Aesthetics					

Ecosystem Service	Economic Indicators	Non-Economic Indicators
Recreation		
Wildlife Viewing	Number of Trips Expenditures of Trip	Satisfaction with wildlife seen
Scuba Diving	Expenditures of Trip Willingness to pay for improvements	Did the trip meet expectations Are resources improving

Ecosystem Services

Step 3

Optional Rating Scheme for Ecosystem Services: How to get to the final ecosystem services ratings using indicators.

Good	Economic indicators are positive and increasing, human dimension non-economic indicators are increasing or stable and ecological indicators do not indicate there is a decline in the natural capital stock.
Good/Fair	Economic indicators are positive and stable, human dimension non-economic indicators are increasing or stable and ecological indicators do not indicate there is a decline in the natural capital stock.
Fair	Mixed results for the economic and non-economic indicators and some ecological indicators indicate a decline in the natural capital stock but not widespread.
Fair/Poor	Economic indicators are negative and declining, while non-economic indicators are negative or stable. Ecological indicators are showing more widespread declines in natural capital stock.
Poor	Economic and non-economic indicators are negative and declining. Ecological indicators are negative showing widespread declines in the natural capital stock.

Ecosystem Services

Step 4

Final Rating Scheme for Ecosystem Services.

Rating	Description of Findings
Good	The capacity to provide the ecosystem service has been either enhanced or remained unaffected.
Good/Fair	Unable to fully provide the ecosystem service due to prior or existing human activity, but performance is acceptable.
Fair	Ability to provide ecosystem service is compromised, and existing management would require enhancement to enable acceptable performance.
Fair/Poor	Ability to provide ecosystem service is compromised, and it is uncertain whether new or enhanced management would restore it.
Poor	Unable to deliver ecosystem service due to the extreme, pervasive or widespread nature of human activities, and it is doubtful that new or enhanced management would restore it.

Ecosystem Services

Step 4

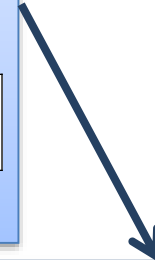
1. Rate Evidence

Consider three categories of evidence typically used to make status or trend ratings: *data*, *published information*, and *personal experience*.

Limited

Medium

Robust



2. Rate Agreement

Among those participating in determining the status and trend rating, or if possible, within the broader scientific community. Levels of agreement can be characterized as **“low,” “medium,”** or **“high.”**



3. Rate Confidence

Agreement ↑	“Medium”	“High”	“Very High”
	“Low”	“Medium”	“High”
	“Very Low”	“Low”	“Medium”

Evidence (type, amount, quality, consistency) →

Ecosystem Services

Step 4

Will be in Appendix in report and also incorporated into summary tables.

Question	2016 Rating	Evidence	Agreement	Confidence	Comments
Sense of Place	Status:				
	Trend:				
Tourism and Recreation	Status:				
	Trend:				
Food	Status:				
	Trend:				
Energy	Status:				
	Trend:				

Ecosystem Services

Step 4



Conclusion

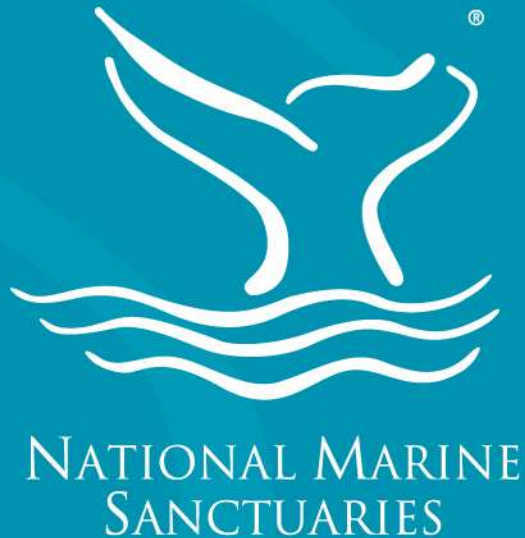
- Expect to meet with experts in spring 2017
- Information is used by
 - Management
 - Educators
 - Community members
 - Scientists
 - Academics



Questions



National Marine Sanctuaries
National Oceanic and Atmospheric Administration



<http://sanctuaries.noaa.gov>

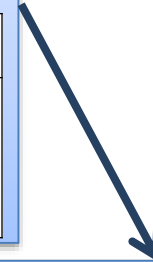
Ecosystem Services

Step 4

1. Rate Evidence

Consider three categories of evidence typically used to make status or trend ratings: *data*, *published information*, and *personal experience*.

Limited	Medium	Robust
Limited data or published information, and little or no substantive personal experience	Data available, some peer reviewed published information, or direct personal experience	Considerable data, extensive record of publications, or extensive personal experience.



2. Rate Agreement

Among those participating in determining the status and trend rating, or if possible, within the broader scientific community. Levels of agreement can be characterized as **“low,” “medium,”** or **“high.”**



3. Rate Confidence

Agreement ↑	“Medium” High agreement Limited evidence	“High” High agreement Medium evidence	“Very High” High agreement Robust evidence
	“Low” Medium agreement Limited evidence	“Medium” Medium agreement Medium evidence	“High” Medium agreement Robust evidence
	“Very Low” Low agreement Limited evidence	“Low” Low agreement Medium evidence	“Medium” Low agreement Robust evidence
Evidence (type, amount, quality, consistency) →			