

# Bringing Social Science into MPA Management & Education

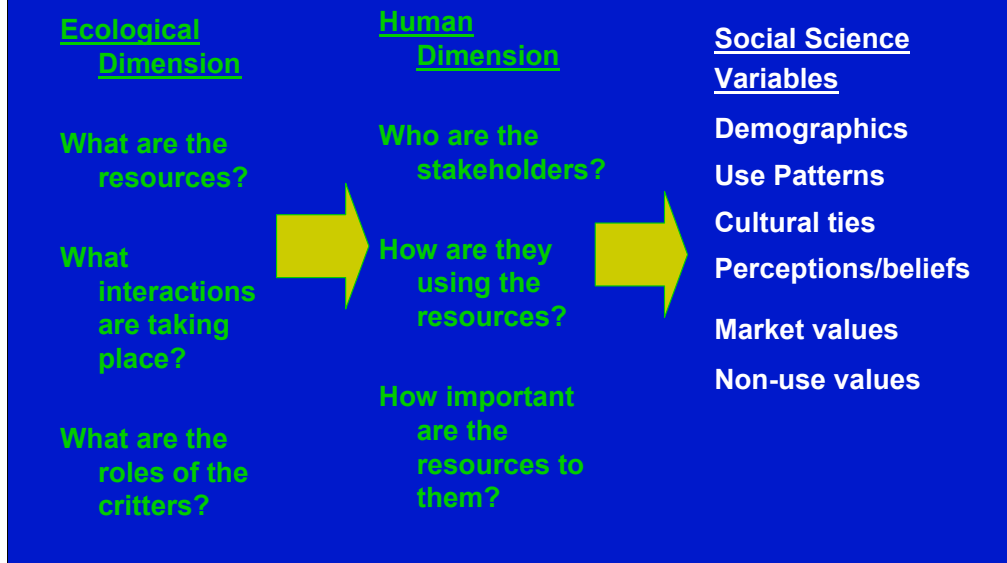
- ★ What do we mean by “social science”?
- ★ How can this information be useful to you?

Hello. I'm a social scientist who basically works on coastal and marine management issues based in NOAA's National Ocean Service headquarters. I basically think of myself as a cheerleader on the role of the social sciences in coastal and marine management.

It's a real pleasure to be giving a talk to an audience predominantly of educators because I think of you as my compatriots in promoting the importance of people in coastal and marine environmental issues. I also think it's interesting 'cause I've often found that social scientists and educators are often interchanged; educators being asked to take on the responsibilities of a social scientist and often vice versa. Yet, as I'm sure you'd agree, we have very different skill sets and training and very different goals in our work. But in reality, we do cross paths and have similar interests in the people side of management. So I was hoping today to give you a sense of how a social scientist thinks of the human dimension of coastal and marine issues, and, hopefully, give you a sense of how our work might help you as an educator.

And that's what I want to talk with you about today: the science of studying people. What are the key things to assess and monitor about people and how important that information may be to educators?

# What do you want to know?



Social science is just that; it's a science—a way of systematically and comprehensively researching, documenting and understanding people. So whereas you might think of natural scientist as looking at biophysical communities, social scientists study human communities, particularly how they affect and are affected by coastal management decisions. Social sciences are often thought of in terms of sociology, anthropology, economics, as well as psychology, political science and geography.

So, what do you want to know as an educator? Well, if you're interested in the ecological dimension you may be asking questions about what are the resources, what interactions are taking place between the resources and the habitat, and what kind of roles are the critters playing in the marine ecosystem. Similarly, if you're looking at conveying information about the human dimension, you may want to talk about who are the stakeholders, how are they using the resources, and how important are the resources to them.

Now in terms of the social scientist, the information that they would be thinking of to answer these three questions would have to do with the demographics of the stakeholders, their use patterns, cultural ties, perceptions and beliefs, market values, and non-use values. I'm going to go through each of these categories and discuss what they mean and really how this information is useful to educators.

## **Demographics** - *Who are the stakeholders? How many are there? What are their characteristics?*

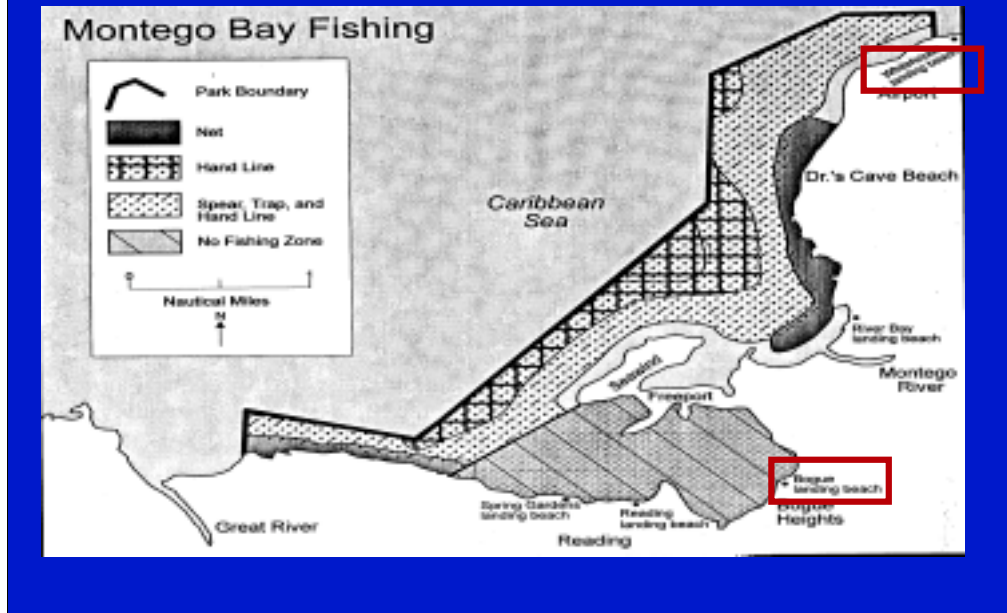


Demographics involves understanding who are the stakeholders, how many are there, what are their characteristics. This is probably the most basic topic to address and involves understanding such other issues such as ethnicity, religion, age, gender and residency.

A classic example of the importance of demographics is when you look at the impact residency makes on education programs when you're dealing with long-term, for example, resident commercial fishermen, as well as short-term, rarely returning recreational fishermen. Long-term resident commercial fishermen are often around long enough to build up their knowledge and understanding of the environment. They often also have a personal vested interest in management and may be more critical of management plans that educators are informing them of. Whereas short-term recreational fishermen are generally not around long enough to absorb information much less to commit to being involved in management. By understanding these demographic differences, the educators have learned to focus on recreational charter boat owners and gain their buy-in, which is then hopefully transferred to the visiting recreational fishermen.

Another case illustrating the importance of demographics comes from the Pacific islands where an education program was being set up to increase awareness of fishing regulations in a marine protected area. The MPA education officers put up billboards in the five main fishing villages, right in the community areas, notifying the community of the new fishing regulations. Over the subsequent months, they noticed that compliance was relatively high among fishermen from three of the villages but low from two others. And when they went into the fishing community to find out what the problem was, they learned that the fishing communities in two of villages of low compliance were relatively illiterate.

## Use Patterns - *What are they doing? Where? How? When?*



Use patterns involves looking at what people are doing, where they're doing it, how and when. It involves such issues as locations of use, seasonality, and types of gear.

The importance of understanding use patterns is demonstrated by a case from Montego Bay Marine Park in Jamaica. The park was looking at establishing no-take reserves within the MPA, and you can see the outline of the MPA in this slide. Basically, there were three main fishing communities, two of which are outlined in bold here. By looking at the dynamics within each community, the social scientists learned that the fishermen in the southern community were dominated by paddleboats, whereas the fishermen in the northern community primarily had motorized boats. What this meant is when the Montego Bay Marine Park was looking at setting up a no-take reserve, if they were to set up the no-take area off the coast of the paddleboat fishing community to the south, the fishermen were going to have to paddle all that way out to the still accessible fishing community. Whereas the fishermen to the north, if they had a no take area set off the coast from them, they'd be able to motorize out. And from this information, the park decided to move the marine protected area no-take reserve to the north so to minimize the impact on the fishermen.

In terms more specific to education programs, you can also imagine how useful it is to be able to show people where the various activities are occurring so they can visually see the impacts on the marine resources. In this slide, you can see we have the marine protected area outlined and then within the marine protected area it's marked where the different types of fishing activities are occurring, so that the public can easily see where you have net fishing or hand-line or spear fishing and they can get a sense of the various levels of impacts on the various marine resources.

**Cultural ties and traditional uses** - *How are the resources and their use linked to the community? How are they tied to their way of life?*



Cultural ties and traditional uses refers to how are the resources and their use linked to the community, how are they tied to their way of life, and how do people structure their lives and communities in relation to the marine resources. Venezuela has a unique relevant example where marine environments are valuable not only for fishing and tourism but also because they play an important role in the local culture. Several MPAs rank not only their reefs and sea grasses as important resources, but also shrines to the Virgin of the Valley that have been built by local residents into the coastal caves. As you can just see in the background here behind these tourists, there's a shrine to the Virgin which the local fishermen and coastal residents pay tribute to. By understanding the coastal significance of these resources and how they are recognized by the community, the MPA managers can better demonstrate the importance of the MPA to the community.

**Cultural ties and traditional uses** - *How are the resources and their use linked to the community?  
How are they tied to their way of life?*

🌀 **Survey of San Andres Native Islanders:**

- 🌀 **What % of your income is from fishing? More than half depend on fishing for less than a quarter of their income**
- 🌀 **Did your parents fish? Yes 82%**
- 🌀 **Did your grandparents fish? Yes 77%**
- 🌀 **How important is fishing to the native islanders? Very important >90%**
- 🌀 **Rank importance of the following activities:**
  - *Construction/development*
  - *Arts&Crafts*
  - *Diving*
  - *Guest house ownership*
  - *Fishing >75% said #1*

Another example comes from San Andres Archipelago in Colombia, where an MPA is being set up to protect marine resources. To determine the cultural value of the MPA to local people, the managers conducted a survey of native residents. They asked them, "What percent of your income is from fishing?" More than half responded that they depend on fishing for less than a quarter of their income, indicating that economically, fishing is really not that important. And yet when they asked them, "Did your parents fish, did your grandparents fish?" the majority of them said yes. When they asked them how important is fishing to the native islanders, the response was "very important" by over 90% of those surveyed. And finally, when the surveyors asked the respondents to rank the importance of a variety of activities, over 75% responded that fishing was the number one, most important activity. This demonstrates that even though fishing may not be important economically, it is important from a cultural aspect.



**Perceptions, beliefs** - *What are their perceptions, attitudes and beliefs about resources, management and stakeholders?*



What are the perceptions, attitudes and beliefs that local people have about resources, management and other stakeholders? A classic example of the importance of this component of social science comes from the Florida Keys National Marine Sanctuary where the fishermen felt that they were not being heard in the original Florida Keys Sanctuary designation process. Regardless of opportunities of input, they felt they were not heard. If you ask the superintendent, Billy Causey, he'll list a whole range of various public hearings that were held and note that the originally proposed no take area covered 20% of the sanctuary and was reduced to less than 1% because of fishermen opposition. But regardless of these facts, the perception among the fishermen is that they were not heard, and it's this perception that continues to affect how the Florida Keys Marine Sanctuary does business, specifically in how they do their outreach and communication programs which now go through an exhaustive process to gain stakeholder buy-in.

## Market & non-market values - *How dependent are they on the resource?*

**Harvest Value, Costs and Net Earnings: 1997-98 and 1998-99**

	1997-98	1998-99	1997-98 to 1998-99
	Harvest		% Change
	Value	Value	
General	\$96,523	\$113,379	+17.5
Sambos	\$97,725	\$129,666	+32.7
	Harvest Cost		%Change
General	\$65,717	\$75,801	+15.3
Sambos	\$70,000	\$83,253	+18.9
	Net Earnings		% Change
General	\$30,806	\$37,577	+22.0
Sambos	\$27,725	\$45,913	+65.6

Market values address the questions how dependent are people on the resource, how important is the resource or using the resource to them from an economic standpoint. Market values are based on activities that are linked to the market, such as fisheries or dive operations, and refers to things such as employment levels and gross earnings.

To demonstrate the value of including market values we take another example from Florida Keys National Marine Sanctuary, which set up a no-take marine reserve called Sambos in 1998. The sanctuary managers wanted to monitor how the fishermen's earnings changed from before the establishment of the no-take reserve to afterwards. So they looked at how the net earnings were for the overall sanctuary before and after, and then what the net earnings were for the fishermen fishing in Sambos before it was shut off to what their net earnings were afterwards when they were displaced to outside the no-take reserve. If you look at this table in the bottom row, you can see net earnings listed for 1997 to 98 before the Sambos was established no-take, and then you can see it afterwards. And you can see in the circled area that overall, net earnings for fishermen throughout the national marine sanctuary in Florida Keys increased by 22%. In contrast, the fishermen who originally were fishing in Sambos, their net earnings increased by 65% from before when they were fishing in Sambos to afterwards when they were displaced out of the area. So this demonstrates that the no-take area actually benefited the fishermen because their net earnings increased 66% after they were excluded from the no-take area.



## Non-use values - *How do they value the existence of a resource?*

1997 Willingness to Pay for Ecological Reserve in FKNMS				
	\$3/household/year	\$5/household/year	\$10/house/yr	
1997 Annual Amount	\$3.39mill	\$5.65mill	\$11.3 mill	

Comparison of Market and Non-Use Values				
	Alternatives			
Industry Values (losses)	II	III	IV	V
Recreation Industry	\$102,965	\$127,029	\$320,791	\$381,108
Commercial Fisheries	\$473,097	\$879,973	\$1,103,808	\$1,239,587
Total	\$576,062	1,007,002	\$1,424,599	\$1,620,695

Non-use values refers to how do people value the very existence of a resource. The classic example is the Grand Canyon. How much are you as an individual willing to pay to insure the Grand Canyon exists. This may be \$5 a year, it may be \$200 a year. These points of information from individuals are then extrapolated for the entire public to get an overall sense of the value of the Grand Canyon.

An example from the marine coastal community comes from again the Florida Keys National Marine Sanctuary, where willingness-to-pay was determined for an ecological reserve within the sanctuary. Economists estimated the value based on \$3 per household per year, up to \$10 per household a year, assuming that 10% of the population would be willing to pay this amount. From this they calculated the value of the reserve was between \$3.3 million and \$11.3 million annually. And what's particularly interesting about this, is you can compare it to what's estimated to be the potential industry values, or rather their losses, to setting up the ecological reserve. And you look at this table in the slide, I've circled 3.3 million as the estimated low ball of the estimated value of the ecological reserve. Then, if you look at the various alternatives the zones they were looking at setting up for the reserve, their range of estimated losses. In looking at the bottom row, the totals range from half a million to one-and-a-half million dollars. So even if you took the estimated highest loss of \$1.6 million dollars, it's still half of the estimated value or gain from setting up the ecological reserve. This was very important information for demonstrating to the public and policy makers that the benefits outweigh the cost of setting up the ecological reserve.

# How is this social science information useful to educators?

## Can be used to...

- Communicate the *people* side of marine conservation
- Demonstrate resource value in 'real terms'
- Understand your audience
- Facilitate stakeholder involvement...

I've now gone through the main components of the social sciences from demographics to non-use values, and hopefully given you a sense of how this information can be useful to educators. But if you take it all together, what is the real usefulness to your work? I just wanted to highlight four ways I think it can be useful.

The first, is hopefully giving you a way of thinking about and communicating to the public who the users are, so that when you're teaching about marine conservation, you can convey what's going on under the water as well as who the people are who are using the resources and depending on them and who are being affected by management decisions.

Second, the social sciences can also be used to demonstrate the value of the marine resources in very real terms. Often people think not so much in terms of biodiversity but more in terms of economic value or cultural value.

Third, hopefully social sciences can give you a better understanding of who your audience is. And finally, can help you facilitate stakeholder involvement, which is particularly important for those of you involved in outreach; by studying the people, you're facilitating stakeholder involvement and demonstrating that they matter.

## Take-Home Message:

- ☞ Social sciences = Who, what, where, when, how & why
- ☞ Important for communicating the whole marine conservation picture

MPA Educators = Pioneers in integrating the human dimension into MPA management?!

Finally, I wanted to conclude by bringing home the main points of this talk. The social sciences can be useful to marine protected area management and education because it provides information on the people side of management. Who they are, what they're doing, when, where, how and why. For educators, because of your existing work with stakeholders, you have a tremendous amount to benefit from better incorporating the social sciences into your programs. It provides you information such as cultural value as well as economic value, and it provides information on the people you're communicating with and educating so you can tailor your programs to best suit their needs.

In many ways, bringing the social sciences into marine conservation sustainable use is a new frontier. Because of your existing work with stakeholders you have a tremendous amount to benefit from better incorporating the social sciences into your marine education programs. And I challenge you to think about how to better incorporate these concepts into your programs in the future.