NOAA Fisheries
Recreational Economics FAQ Sheet

Economic and sociocultural data are used to assess the impact of management policies. When paired with catch and stock data, this information forms the core components of most regulatory and allocation decisions. NMFS' recreational economics program assists in the decision-making process by providing managers with informative analyses of these data. NMFS continues to seek new ways to enhance data collection efforts and provide new analyses that meet management needs.

During the fall of 2006, NMFS asked the University of Miami Center for Independent Experts (CIE) to review NMFS' recreational economics program. NMFS has been gathering economic and demographic data using add-on surveys to the Marine Recreational Fisheries Statistics Survey (MRFSS) since 1994. The review covered the three basic types of analysis NMFS conducts with this data:

1. Estimation of revealed preference models, which value access to fishing sites;
2. Stated preference choice experiments, which directly ask fishermen about preferred management options; and
3. Economic impact analysis, which provide information on the contribution of recreational fishing to the local economy.

The CIE review provided validation for some of our current methods. Specifically, we were concerned the MRFSS shortcomings identified by the National Research Council (NRC) might cause severe problems for the economic data and analyses. The CIE found no evidence of this. Instead, they found the MRFSS add-ons to be an effective means of gathering data. They found the suite of models used by NMFS to be appropriate given the extent of peer reviewed publications using the economic data. Further, the CIE also found the recreational economics program to be very cost effective and currently the only feasible way to collect the data given the "meager" budget.

The CIE also highlighted some areas where the program could improve. They recommended continued focus on surveys targeted for specific management goals, like stated preference choice experiments (SPCEs), while testing the validity of these measures and streamlining data collection. Additionally, to the extent that fishing access sites serve as the basis for estimating revealed preference models, improvements in the site register would improve those models. Finally, the CIE recognized that, as effort and participation grow into the future, increased attention to the economics of recreational fishing and increases in funding will be required.

Frequently Asked Questions

Question: What is the difference between valuation and economic impacts?

Answer: In a very small nutshell, valuation answers the question is society better or worse off as the result of changing a policy. Commercial harvester value is essentially their profits and angler value can be thought of as angler profit: that is what the angler gets to keep above and beyond what they paid to go fishing. Economic impacts should never be used to

determine if an increase in the size limit or a change in allocation should be made. Instead economic impacts trace the flow of expenditures in an economy and do two things: demonstrate the current size and therefore importance of recreational fishing and, when a policy change occurs they track how the policy changes expenditure patterns defining who specifically wins or loses as a result of a policy. We are also mandated by law to estimate both value and economic impacts.

Question: How often does NMFS collect expenditure data?

Answer: Below is the list of expenditure surveys NMFS has conducted to date:

	Survey Year
Northeast	1998, 2000 (trip expenditures only)
Southeast	1999, 2004 (trip expenditures only)
Pacific Coast	2000
Caribbean	2004
Nationwide	2006 (AK, TX, and HI included for the first time)

Question: How often does NMFS collect valuation data?

Answer: Below is the list of valuation surveys NMFS has conducted to date:

	Survey Year
Northeast	1994, 1996, 1998, 1999, 2000, 2004
Southeast	1997, 1999, 2000, 2003
Pacific Coast	1998, 2001
Caribbean	2004

Question: How can we produce defensible estimates of value, effort shifts, and economic impacts for particular species of fish?

Answer: We have to rely on stated preference choice experiments (SPCE), or conjoint surveys, to gather these data. We have conducted a number of these surveys, see list below, and we have pledged to cover all species covered by a management plan as soon as possible. We have picked this methodology because we don't have a time series of economic data, and even in areas where we have a short time series, there is not enough variation in the regulations over those years to estimate relationships.

	Survey Year
Alaska	2000
Northeast	2000 (summer flounder)
Southeast	2004 (grouper, red snapper, king mackerel, & dolphin)
OR and WA	2006 (planned to cover rockfish, salmon, & halibut)
Alaska	2007 (planned to cover rockfish, salmon, & halibut)
California	2008 (planned to cover rockfish, salmon, & halibut)

Question: How can the recreational economic data be used to value environmental damages?

Answer: There are two components of value lost when there is an oil spill or some other environmental damage: use value and non-use or existence value. Our valuation models

quantify the value of recreational access, which is a large part of the use value when a spill shuts down a beach or other coastal area. Often, our data is the only periodically collected data available to look at use values.

Question: Can we get access to the unpublished study on comparing expenditures between private and public access?

Answer: There was never a report generated. The results mentioned in the review refer to an analysis of Southern California highly migratory species angler expenditures. A handful of expenditure questions were collected during the random digit dialing (RDD) survey which also asked if the angler's last trip was from a private marina. We compared the means, across small sample sizes, and could not reject that the mean expenditures between public and private access anglers were the same. Certainly more comprehensive work needs to be done in this area.

Question: The reviewers recognize current survey weaknesses, but say those weaknesses are not severe. Please explain because that seems to contradict with the weaknesses the reviewers list.

Answer: The main weakness being referred to is the endogenous stratification issue, which is a problem for all onsite surveys. Endogenous stratification means that a particular group is being under (over) sampled because of the sampling process itself. In this case, the survey was designed to be a random sample of trips, which means more avid anglers are intercepted more frequently. This bias does not impact trip expenditure estimates at all, and we weight the problems out of the annual expenditure data using a CIE-approved method. For our valuation models, we need information about sampling rates relative to the total pressure at a site, information the current MRFSS can't provide. Fortunately, while better information improves our economic models, the impact of not having the information is slight. That is, the changes in the estimate would not be enough to change the conclusions of the analysis and are, therefore, considered not severe. Plans are to upgrade the recreational fishery sampling procedures in ways that will also help our examination of this bias. We have not explored the severity of bias introduced by not including private access or night fishing, other weaknesses identified by the NRC.

Question: The industry sees flat lining participation, yet the report states that there will be "steady, long run growth in marine recreational fishing." What is the real story?

Answer: The MRFSS data indicate the long-term trend in participation and effort is increasing. The data show a sharp drop in participants in 2002, down nearly 1.5 million, but the trend has been steadily increasing since and it is nearly back up to this 2001 level. There was a similar drop in effort in 2002 and it has not recovered to 2001 levels. This describes national level estimates of participation and effort, which may disguise local trends. However, the report's claims were for the nation as a whole. If coastal population continues to increase, it stands to reason that the long term trends in effort and participation in the survey data will likely be supported into the future.

Question: Can the economics surveys use a license frame and still produce valid samples?

Answer: Yes, and we have used license frames to conduct our surveys. The current expenditure survey uses license frames in Oregon, Washington, California, Texas, Alaska, and the highly migratory species permit database. With regard to producing a valid sample, as long as a random sample of licensees is drawn, it can be a valid sample.

Question: Sample clustering has been identified as a problem. How will the economics survey deal with it?

Answer: The NMFS has plans to improve the sampling strategy for marine recreational fisheries, including how to handle clustering. Whatever improvement is made will be adopted by the economics survey where possible.

Question: How can a model account for unobserved site characteristics?

Answer: In our models, we can include an extra variable that represents everything at that site that we have not measured or observed. When we estimate that model, we have therefore accounted for the variation in the modeled variable explained by those site specific characteristics that went unobserved. Using this approach one cannot then determine what contribution individual unobserved characteristics contributed, but can see the effect of all the characteristics combined. Certainly this is inferior to having explicit information on site characteristics, but it is an acceptable method to capture the effect of these characteristics without the expense of gathering the specific information.

Question: How are we going to estimate how angler effort changes when regulations change?

Answer: Again, we have adopted stated preference choice experiments (SPCE) surveys to address the need to predict effort shifts and have conducted a number of surveys to estimate these relationships. One of the reviewers mentioned there is still a lot to be learned about this methodology and we endeavor to explore improvements in our SPCEs as a tool for managers.

Question: What level of spatial resolution is there in the economic impact data and can it be used for community impact analysis?

Answer: The data are collected to provide estimates at the state level stratified by resident status and fishing mode. That is not to say that we couldn't provide estimates at the community level by applying a state average to community effort and participation, but we do not publish effort or participation estimates at the community level.

Question: Is the opportunity cost of an angler's time accounted for in your models?

Answer: Our valuation models do incorporate opportunity cost, but only for those individuals that take time off work without pay to participate. This is a common methodology in the literature, albeit a conservative approach since those on paid leave are essentially being paid for their time. For those taking time of work without pay, we include their travel time and time onsite multiplied by their current wage rate to get this value.

Question: Can we produce "real-time" economic estimates?

Answer: Currently, we run our expenditure surveys every five years and our valuation surveys as often as we can afford to conduct them. Both the valuation estimates, expenditure estimates, and economic impacts can be updated using effort and participation estimates every wave, which are available 45 days after the close of each wave under the current survey design.

Question: What information do we need to make allocation decisions using economics so that all sectors are compared apples to apples?

Answer: As discussed above, value estimates must be used to decide the most efficient allocation of the public fishery resource. Ideally, allocation decisions must be made based on who has the higher value for the next fish. On the harvester side, this includes their economic profits denominated by numbers or pounds of fish and on the recreational side, the anglers' willingness to pay for that next fish. For more information on this topic, see: *Edwards, S.F. 1994. An economic guide to allocation of fish stocks between commercial and recreational fisheries. NOAA Technical Report. National Marine Fisheries Service*.