

NOAA'S
National Marine Fisheries Service
(NMFS)
Overcapacity Project

A Management Priority

- There is overcapacity in many fisheries in the U.S. and elsewhere.
- That is, the fishing capacity of the existing fleets exceeds the target catch levels of many stocks of fish.

A Management Priority

- The TCL is the catch level that will sustain a stock at or allow the stock to rebuild to a level that can support productive fisheries and marine ecosystems, as well as viable fishing industries and fishing communities.

A Management Priority

- The total allowable catch (TAC) is an example of a short-run TCL and maximum sustainable yield (MSY) and maximum economic yield (MEY) are examples of a long-run TCL. .
- Persistently high levels of overcapacity can make it more difficult to meet conservation and management objectives, including the following eight broad objectives:

Management Objectives

1. Sustainable levels of catch and the subsequent biological, ecological, social, and economic benefits;
2. Bycatch that is minimized to the extent practicable;
3. Efficient or economically viable harvesting and processing operations;
4. Stable/viable fishing communities;

Management Objectives

5. Fishery management programs that are not unnecessarily costly, complex and intrusive;
6. Safe fishing operations;
7. Habitat conservation; and
8. Productive and sustainable marine ecosystems.

Therefore, assessing fishing capacity and controlling the level and use of fishing capacity are high priorities for many countries, and they are integral parts of U.S. efforts to implement ecosystem approaches to management.

International Activities to Address Fishing Capacity

NMFS has been an active participant in international efforts to assess and control fishing capacity.

It was a key participant in the United Nation Food and Agriculture Organization's (FAO) technical and policy-level consultations of 1991-1999 that led to:

- the Code of Conduct for Responsible Fisheries
- the International Plan of Action for the Management of Fishing Capacity

FAO International Plan of Action for the Management of Fishing Capacity

1. The International Plan is voluntary.
2. The International Plan includes a call for each State to:
 - conduct assessments of fishing capacity
 - improve its capability for monitoring fishing capacity
 - develop, adopt and make public a national plan for the management of fishing capacity.

U.S. National Plan of Action for the Management of Fishing Capacity

- The National Plan was released August 2004.
- In the National Plan, “excess capacity” is defined as the difference between harvest capacity and actual harvests, and “overcapacity” is defined as the difference between harvesting capacity and a management target catch level (TCL)

U.S. National Plan of Action for the Management of Fishing Capacity

- The National Plan makes it clear that addressing overcapacity in federally-managed fisheries is a shared responsibility of the Regional Fishery Management Councils (Councils) and NMFS
- The assessment commitments of NMFS include the following:

Assessment Commitment 1

Determine and conduct the types of assessments that will:

- Meet the commitment to prepare regular assessments of overcapacity in federally-managed fisheries and
- Be useful to the Councils and NMFS as they continue their efforts to address the problems of overcapacity.

Assessment Commitment 2

Assist the Councils in obtaining additional information they can use to:

- Assess the need to decrease fishing capacity;
- Assess progress in addressing the problems of overcapacity; and
- Design and assess alternatives to address those problems more effectively.

Councils' Roles

1. Establish the management targets (i.e., target catch levels) that will be used as the reference points in the periodic assessments of the levels of overcapacity
2. Determine the need, objectives and appropriate methods for managing fishing capacity

Council's Roles (Cont.)

3. In cooperation with NMFS, determine what to include as “federally-managed” commercial fisheries
4. Assist in providing background information that will be used in addressing fundamental issues and conducting the assessments
5. Be aware of the fundamental problems related to the assessment and management of fishing capacity

NMFS Efforts

- In late 1998, NMFS developed recommendations for the implementation of a standardized fishing vessel registration and information management system. The recommendations are being implemented under the National Fisheries Information System
- NMFS established a National Fishing Capacity Task Force for Defining and Measuring Fishing Capacity in 1998. The Task Force completed its initial draft report in 1999.

“Fishing Capacity”

NMFS Umbrella Definition

The maximum amount of fish a fishing vessel or fleet is able, or willing and able to catch over a period of time (e.g., a year or a fishing season) given specified constraints and objectives

“Able”

The maximum amount of fish a fishing vessel or fleet is physically capable of catching, limited only by the following constraints:

“Able” (Cont.)

1. its fixed inputs (i.e., the physical characteristics of each vessel in the fleet including engine horsepower and various measures of vessel size, and, in some cases, the quantity and size of its gear)
2. readily available variable inputs (e.g., labor and fuel)
3. resource conditions (i.e., the status of stock conditions for the target and non-target species)

“Able” (Cont.)

4. the state of the technology
5. customary and usual operating procedures
6. as appropriate, other constraints including market conditions and some fishery regulations that may limit total catch. Some of these constraints are reflected in “customary and usual operating procedures”.

“Willing and Able”

The choice by fishermen to catch fish subject to the constraints listed above (see "able") and some objective such as output, profit, or revenue maximization.

FAO Definition of Fishing Capacity

“the amount of fish (or fishing effort) that can be produced over a period of time (e.g. a year or a fishing season) by a vessel or a fleet if fully utilized and for a given resource condition”, where “full utilization means normal but unrestricted use, rather than some physical or engineering maximum.”

“Full Production Capability” (U.S. Census Bureau, Federal Reserve and the Defense Logistics Agency)

The maximum level of production that this establishment (e.g., vessel) could:

1. reasonably expect to attain
2. under normal and realistic operating conditions
3. fully utilizing the machinery and equipment in place and ready to operate

Three NMFS Reports

- NMFS initiated a plan to prepare a series of three reports on fishing capacity for federally-managed commercial fisheries.
- The first report, *Identifying Harvest Capacity and Over-Capacity in Federally-Managed Fisheries: a Preliminary Qualitative Report*, was completed in 2001.

Three NMFS Reports (Cont.)

- The second report, *Assessments of Excess Fishing Capacity in Select Federally-Managed Commercial Fisheries*, was completed last month.
- The third report, which will provide quantitative assessments of overcapacity, will be completed in 2007.

Two Overcapacity Workshops

The first workshop focused on the fundamental assessment issues that needed to be addressed before the most useful types of assessments of overcapacity could be identified and conducted.

A High Priority for NMFS

At the first workshop, introductory comments were made by three members of the NMFS Senior Management Team:

1. Bill Hogarth, Director
2. Jim Balsiger, Acting Deputy Assistant Administrator for Regulatory Programs
3. Steve Murawski, Director of Scientific Programs and Chief Science Advisor

A High Priority for NMFS & the Councils

The participants at the first workshop represented:

- 7 of the 8 Councils
- 2 Regional Offices (SERO & PIRO)
- 3 Science Centers (AKC, SWC & NEC)
- 4 HQ Offices (IA, Policy, SF, & ST)

Fundamental Issues

- Why is addressing the problems of overcapacity a high priority?
- What do we mean by "federally-managed" fisheries?
- Why will we initially focus on commercial fisheries?

Fundamental Issues

- What are the roles for assessments of fishing capacity and overcapacity?
- Is it feasible to prevent overfishing by just decreasing fishing capacity?

Fundamental Issues

- Should we use a single species approach to assess and address the problems of overcapacity?
- Should we consider all of the fishing activities of a vessel when assessing its fishing capacity?

Fundamental Issues

- What types of comparability of assessments are desirable and what levels of aggregation are useful?
- Should fishing capacity be defined in terms of the amount of fish a fleet is able to catch or the amount it is willing and able to catch?

Fundamental Issues

- Should we include latent capacity?
- Which fishery regulations should be included in defining and assessing fishing capacity?

Fundamental Issues

- Is it relevant to assess the overcapacity of the current fleet for resource conditions that will not be attained for many years?
- Can fishing capacity be controlled effectively by controlling the aggregate physical characteristics of the fleet?

Fundamental Issues

- How should we resolve the other potential problems of using the definition of overcapacity in the National Plan?
- Should fishing capacity be reduced if there is overcapacity?

Second Overcapacity Workshop

The principal object for the second overcapacity workshop was to discuss:

- what will be included in the first of the regular assessments of overcapacity;
- the process and analytical methods that will be used to conduct the assessments; and;
- how specific data/modeling issues will be addressed.

Although the workshop focused on meeting the first commitment, it will assist in meeting the second commitment by providing:

1. part of the conceptual and analytical foundation for meeting the second commitment and
2. data sets that can be used in conducting some of the assessments that will be useful for meeting the second commitment.

Assessment Commitment 1

Determine and conduct the types of assessments that will:

- Meet the commitment to prepare regular assessments of overcapacity in federally-managed fisheries and
- Be useful to the Councils and NOAA Fisheries Service as they continue their efforts to address the problems of overcapacity.

Workshop Participants

The following were represented:

- Each Science Center;
- The Offices of Sustainable Fisheries and Science & Technology; and
- Two Regional Fishery Management Councils.

What do we mean by “regular”
assessments?

Draft proposal for what will be included in the first assessment of overcapacity

- Criteria
- Elements of the proposal

The criteria and elements are based on discussions at the first workshop and were modified during the second workshop.

Criteria

This proposal is intended to meet, to the extent practical, the following criteria for useful regular assessments of overcapacity.

Criterion 1

The assessments should be in terms of overcapacity as defined in the National Plan.

Criterion 2

A standard output measure of capacity should be used.

Criterion 3

Disaggregated, vessel level data should be used in the assessment models.

Once this is done, we can then assess capacity for relevant groups (fleets, FMPs, etc.).

Criterion 4

The assessment of capacity should reflect the fact that many fishing vessels participate in:

- multispecies fisheries or
- multiple fisheries

and account for all of the fishing activities of the fishing vessels that participate in federally-managed commercial fisheries.

Criterion 5

The assessments should recognize the ability and propensity of vessels to change the species composition of their annual catch.

Therefore, if our models assume a constant catch composition, we should make the appropriate caveats and present auxiliary information.

Criterion 6

Latent capacity should be addressed.

Criterion 7

The assessments should be feasible given the data and resources that are expected to be available.

It should be recognized that data deficiencies (availability and quality) are a major limitation on our ability to assess fishing capacity and overcapacity.

The six elements of the proposal

1. Use the definition of capacity that is used by the U.S. Census Bureau, the Federal Reserve Board, and the Defense Logistics Agency in assessing full production capability (i.e., capacity) for many industries in the U.S.

Element 2

Provide estimates of fishing capacity based on that definition but with capacity measured by weight, not value, and with capacity measured for a recent year, not just a quarter.

Element 3

Use the definition of overcapacity presented in the National Plan (i.e., fishing capacity – TCL).

Element 4

Provide auxiliary information including the following:

1. Estimates of capacity utilization (CU) and unbiased capacity utilization (CU').

Element 4 (Cont.)

2. Estimates of the fishing effort (e.g., days fished) that would have been required to take the capacity level of catch.

Element 4 (Cont.)

3. A separate estimate of latent fishing capacity or fishery-specific comparisons between the number of fishing vessels that participated in a fishery the year for which fishing capacity is estimated and the number of vessels that were permitted to participate in that fishery that year

Element 5

Limit the initial assessment of overcapacity to comparisons of the recent level of fishing capacity to both the TAC for the same year and the TAC for the rebuilt stock conditions, if these two TACs differ.

Note: The term TAC, which is more widely used, is used here instead of TCL.

Element 6

Postpone an assessment of overcapacity in terms of fishing capacity and a TAC, where both are for a preferred, long-run set of stock conditions that differs from the current set of conditions, until the types of research mentioned in the full proposal have been completed.

Proposed Cooperative Process for Conducting the First Assessments

The proposal includes specific
responsibilities for various participants

Center/Region/Council Responsibilities

Each Center will have the lead in coordinating the efforts of NMFS (e.g., a Center and Region) and the associated Council(s) to provide data and information for the assessments.

Each Center/Region/Council will be expected to:

- a) identify the federally-managed commercial fisheries;
- b) identify the input variables to be used in the assessments;
- c) provide usable input and output data with the required identifiers in an agreed to, easy to use format;
- d) provide vessel characteristics for the latent vessels;

Each Center/Region/Council will be expected to:

- e) provide the TACs (or proxies) that will be used to calculate overcapacity;
- f) determine the percentage of fleet activity for which adequate data are provided for the assessments;
- g) address data quality issues that are identified when the data are used in the assessments;

Each Center/Region/Council will be expected to:

- h) identify the group of fishing activities to be included in each model;
- i) identify which species to treat separately vs. as an aggregate for each group of fishing activities; and
- j) provide advice on modeling and data issues.

Other Responsibilities

John Walden, in consultation with each Center, will:

1. specify the data (and format) to be provided by each Center and
2. conduct the assessments for all the federally-managed fisheries for which data are provided.

Other Responsibilities (cont.)

Jim Kirkley will be an advisor on modeling and data issues.

John Walden and Joe Terry will prepare both the draft and final reports on the overcapacity assessments.

Each Center/Region/Council and Jim Kirkley will review the draft report.

Proposed Analytical Methods

1. Use DEA to estimate:
 - fishing capacity,
 - capacity utilization and
 - the effort required to take the capacity level of catch for a recent year.

Proposed Analytical Methods (Cont.)

2. Modify/augment DEA models to account for, to the extent practical:
 - all of the fishing activities of the fishing vessels that participated in federally-managed commercial fisheries
 - fishery regulations that directly limit catch (e.g., days at sea and catch quotas).

Types of Data

1. Vessel IDs in federally-managed commercial fisheries (FMCFs)
2. Output in FMCFs
3. Fixed Inputs
4. Variable Inputs in FMCFs
5. Status of Stock Conditions
6. Vessel IDs in non-FMCFs
7. Output in non-FMCFs
8. Variable Inputs in non-FMCFs

Specific Modeling and Data Issues

1. When there are differences in data availability across fisheries or regions:
 - will a lowest common denominator model be used for all assessments,
 - will the best model be used for each assessment or
 - will both be done to allow comparisons among models?

Specific Modeling and Data Issues

2. For what year will we conduct the assessments?
3. Will we use trip or annual observations?

Specific Modeling and Data Issues

4. If capacity is estimated per trip or day at sea, how will we estimate capacity per year?
5. What will we assume concerning returns to scale?

Specific Modeling and Data Issues

6. Will we use data for multiple years and if so will we use multi-year averages for the inputs and outputs in the DEA model?
7. Will we use multiple fixed inputs or an aggregate proxy input for each vessel in the DEA model?

Specific Modeling and Data Issues

8. Do we want to estimate CU for each species or for all of a vessel's (fleet's) activities?
9. Will CU and CU' for a fleet be based on simple or weighted mean for the vessels in a fleet/fishery?

Specific Modeling and Data Issues

10. Will landed weight be in terms of live-weight-equivalent or landed weight?
11. Will we estimate and report fishing capacity, CU and CU' just in terms of weight or will it be done in terms of revenue too?

Specific Modeling and Data Issues

12. Stratification: What process will we use?

- a dissimilarity analysis of data and
- expert opinion

Specific Modeling and Data Issues

13. Should the stratification be based on:

- Gear
- Area fished
- Vessel size
- catch rates (e.g., catch/trip or catch/year)

Specific Modeling and Data Issues

14. Is it feasible and useful to conduct multiple-fishery and/or multi-regional analysis?
15. How will we modify/augment the DEA models to address all the fishing activities of a vessel?

Specific Modeling and Data Issues

16. Will the estimates of capacity be based on:

- the potential output if technical inefficiency is eliminated and inputs are fully utilized or
- the potential output if just the latter occurs (i.e., inputs are fully utilized but technical inefficiency is not decreased)?

Specific Modeling and Data Issues

17. How will we identify and deal with outliers?
18. What will be done to recognize the potential problem of assuming that each vessel could operate on the frontier?
19. How will we deal with noise in the data?

Specific Modeling and Data Issues

20. Are we going to include confidence intervals; if so, will bootstrapping or some other method be necessary?
21. What aggregation issues will we deal with and how?

Specific Modeling and Data Issues

22. What regulations are included as constraints in the definition and assessment of fishing capacity (i.e., what are the **normal** and **realistic** operating conditions)?
23. If not all current regulations are included, how will we estimate capacity?

Specific Modeling and Data Issues

24. What will we do when data are not available for a significant part of a fishery or fleet?
25. To what extent will we address the capacity of the processing sector?

Specific Modeling and Data Issues

26. How will we calculate overcapacity for a fishery/fleet without a well defined TAC?

27. How will we calculate overcapacity

- if the TAC is in terms of total catch,
- if the estimate of fishing capacity is in terms of landed catch and
- if there is a substantial difference between landed and total catch?

Specific Modeling and Data Issues

28. For the auxiliary information, will estimates of both CU and CU' be provided?

29. What measure(s) of effort will be used?

Specific Modeling and Data Issues

30. To what extent can we estimate fishing capacity using a measure that corresponds to the proposed definition?
31. What caveats should be used to explain any deficiencies in our ability to do that?
32. What if anything will be done to address the vessels lost due to Katrina etc.?

Efforts Beyond the First Round of Assessments of Overcapacity

1. Research required to conduct assessment of overcapacity in terms of fishing capacity and a TAC, where both are for a preferred, long-run set of stock conditions that differs from the current set of conditions
2. Efforts to improve our ability to conduct subsequent rounds of regular assessments of overcapacity

Efforts Beyond the First Round of Assessments of Overcapacity (Cont.)

3. Efforts to meet the second assessment commitment.

Assist Councils in obtaining additional information they can use to:

- a) assess the need to decrease fishing capacity;
- b) assess progress in addressing the problems of overcapacity; and
- c) design and assess alternatives to address those problems more effectively.

Efforts Beyond the First Round of Assessments of Overcapacity (Cont.)

4. Revisit and revise the National Plan of Action for the Management of Fishing Capacity

FULL PRODUCTION CAPABILITY

- 1. Full Production Capability** – The maximum level of production that this establishment could reasonably expect to attain under **normal** and **realistic** operating conditions fully utilizing the machinery and equipment in place. In estimating market value at full production capability, consider the following:

FULL PRODUCTION CAPABILITY

2. Assume **only** the machinery and equipment in place and ready to operate will be utilized. Do not include facilities or equipment that would require extensive reconditioning before they can be made operable.

FULL PRODUCTION CAPABILITY

3. Assume **normal** downtime, maintenance, repair, and cleanup. If full production requires additional shifts or hours of operation, then appropriate downtime should be considered in the estimate.
4. Assume number of shifts, hours of plant operations, and overtime pay that can be sustained under **normal** conditions and a **realistic** work schedule.

FULL PRODUCTION CAPABILITY

5. Assume labor, materials, utilities, etc. are fully available.
6. Assume a product mix that was **typical** or representative of your production during the fourth quarter. If your plant is subject to short-run variation, assume the product mix of the current period.

