



NOAA Scientific Publications Report May 11- 24, 2012

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1. HIGHLIGHTED ARTICLES

- 1a. **Title:** *From Krill to Convenience Stores: forecasting the economic and ecologic effects of fisheries management on the US West Coast*

Journal: Marine Policy

Authors: Isaac Kaplan and Jerry Leonard (Northwest Fisheries Science Center)

Expected publication date: 2 May 2012

Summary: There is a need to better understand the linkages between marine ecosystems and the human communities and economies that depend on these systems. Here those linkages are drawn for the California Current on the US West Coast, by combining a fishery ecosystem model (Atlantis) with an economic model (IO-PAC) that traces how changes in seafood landings impact the broader economy. The potential effects of broad fisheries management options are explored, including status quo management, switching effort from trawl to other gears, and spatial management scenarios. Relative to Status Quo, the other scenarios here involved short-term ex-vessel revenue losses, primarily to the bottom trawl fleet. Other fleets, particularly the fixed gear fleet that uses pots and demersal longlines, gained revenue in some scenarios, though spatial closures of Rockfish Conservation Areas reduced revenue to fixed gear fleets. Processor and wholesaler revenue tracked trends in the bottom trawl fleet, which accounted for 58% of total landings by value. Income impacts (employee compensation and earnings of business owners) on the broader economy mirrored the revenue trends. The long-term forecast (15 years) from the Atlantis ecosystem model predicted substantial stock rebuilding and increases in fleet catch. The 15 year projection of Status Quo suggested an additional ~\$27 million in revenue for the fisheries sectors, and an additional \$23 million in income and 385 jobs in the broader economy, roughly a 25% increase. Linking the ecological and economic models here has allowed evaluation of fishery management policies using multiple criteria, and comparison of potential economic and conservation trade-offs that stem from management actions.

Important conclusions:

- Income impacts on the broader economy mirror trends in fishery revenue.
- The 15 year forecast predicts an additional \$23 million in income and 385 jobs for the broader economy (~25% increase).

Significance for management:

- This article explores broad fishery policy options for the U.S. West Coast and draws connections between marine ecosystems and the human communities and economies that depend on them.
- A marine ecosystem model is combined with an input-output economic model facilitate an evaluation of management strategies and tradeoffs between economics and conservation.

Press release: None planned, though a NMFS Northwest Fisheries Science Center web story is planned.

- 1b. **Title:** *Productivity Change under an Individual Transferable Quota Management System*

Journal: American Journal of Agricultural Economics

Expected publication date: May 2012

Authors: John Walden, James Kirkley, Rolf Fare, Philip Logan (ret.); NMFS/NEFSC Woods Hole Laboratory

Abstract: This study examines productivity change in the Mid-Atlantic surfclam and ocean quahog fishery, which has been managed since 1990 using Individual Transferable Quotas (ITQ). Productivity change is estimated through a Malmquist index from 1981–2008, capturing change

before and after implementation of the quota system. We then decompose the index to examine changes in technical efficiency, scale efficiency, and technical change. Our findings indicate that the ITQ system has not sustained gains in vessel productivity. These results are thought to be driven by spatial changes in biomass and the inability to access more productive fishing grounds.

Important conclusions: The surfclam/ocean quahog ITQ system has not sustained, as was expected, the initial gains in vessel productivity.

Significance for management: The causes of declining productivity had no single cause, but rather fishing down productive beds, a shift in stock distribution, and other factors beyond the control of fishing vessels contributed to this result.

Degree of controversy: Moderate; revises view of ITQs in this fishery, shows some long-term warning signs to look for in managing ITQ-based fisheries

2. ADDITIONAL ARTICLES

Top Tier Journals

Intermediate-Tier Journals

Regional/Highly Specialized Journals

2a. **Title:** *Influence of the Lake Erie Over-Lake Boundary Layer on Deep Convective Storm Evolution*

Journal: Weather and Forecasting

Authors: **Thomas E. Workoff** (NOAA/NWS/NCEP Hydrometeorological Prediction Center), David A. R. Kristovich, Neil F. Laird, **Robert LaPlante** (NWS Weather Forecast Office, Cleveland, Ohio), and **Daniel Leins** (NWS Weather Forecast Office, Phoenix, AZ)

Expected publication date: Oct-Dec 2012

Significance: To improve our understanding of the evolution of storms crossing Lake Erie, the authors used observations from Weather Surveillance Radar - 1988 Doppler (WSR-88D), surface, buoy, and rawinsonde sites to determine that on average, all storm modes tended to weaken over the lake; however, considerable variability in changes of storm intensity existed. Isolated and cluster storm modes exhibited much greater weakening than those storms organized into lines or convective complexes. The atmospheric parameters having the greatest influence on storm intensity over Lake Erie varied by mode. This paper will aid NWS forecasters in forecasting convective systems in the Great Lakes region.

2b. **Title:** *Exploring Impacts of Rapid-scan Radar Data on NWS Warning Decisions*

Journal: Weather and Forecasting

Authors: **Pamela L. Heinselman** (National Severe Storms Laboratory), Daphne S. LaDue, **Heather Lazrus** (Cooperative Institute for Mesoscale Meteorological Studies)

Expected publication date: Early online release (4/19/12)

Significance: To explore potential impacts of rapid-scan weather radar data on forecaster warning decision-making, twelve National Weather Service forecasters participated in a preliminary study involving a tropical tornadic supercell case. Their decision processes were observed and audio recorded; interactions with data displays were video recorded; the products were archived; and debriefings were conducted. Analysis of these data revealed that though

teams examining the same data sometimes came to different conclusions about whether and when to warn, the resulting warning decisions were suggestive of a positive effect of rapid-scan data on warning lead time for short-lived, weak tornadoes, demonstrating the potential to extend warning lead time and improve forecasters' confidence compared to standard operations.

2c. **Title:** *Operational fisheries in New England: Linking current fishing practices to proposed ecological production units*

Journal: Fisheries Research, Special Publication

Expected publication date: Revisions accepted May 7, 2012, proofs in prep

Authors: Sean M. Lucey and MJ Fogarty, NMFS/NEFSC Woods Hole Laboratory

Summary: The Northeast US continental shelf has a rich tradition of commercial fishing. These fisheries have been managed using single species/stock assessments. Recently, there has been a movement toward a more holistic ecosystem-based management approach. This ecosystem-based approach is a departure from traditional single species management in that both spatial and multispecies considerations are paramount. To facilitate the place-based aspect of ecosystem-based management, management units are being established that take account of oceanographic, biological, and socio-economic properties. Here, we define operational fisheries for this region on the basis of landings composition by gear type and the spatial and temporal dimensions associated with them. Using vessel trip catch reports of New England commercial fishing vessels operating during 2004-2008, we defined operational fisheries using k-means clustering. The landings data from these vessels were assembled by ten minute latitude/longitude rectangles and segregated by six major gear types: otter trawls, dredges, pots, longlines, gillnets, and seines. The seasonality of each fishery was examined, as was the vessel sizes and their species catch composition. Patterns of resource usage were detected that will be useful in identifying appropriate ecosystem-based management units.

Important conclusions: Current fishing practices based on vessel logbooks (trip report) data align with ecological production units proposed for ecosystem-based fisheries management.

Significance for management: The proposed ecological production units were based on oceanographic and lower trophic level properties, they also proved to be of an appropriate size for the fishing community. However, the borders should be reassessed periodically.

2d. **Title:** *New NOAA Data, Products, and Research to Support Satellite Anomaly Assessment*

Journal: Conference Proceedings: 12th Spacecraft Charging Technology Conference

Expected publication date: 13 May 2012

Authors: Janet C. Green (NESDIS/NGDC), William Denig (NESDIS/NGDC), Juan Rodriguez (NESDIS/NGDC), Janet Machol (NESDIS/NGDC), Terry Onsager (NWS/SWPC), Rob Redmon (NESDIS/NGDC), Howard Singer (NWS/SWPC), Dan Wilkinson (NESDIS/NGDC)

Abstract: The NOAA National Geophysical Data Center and Space Weather Prediction Center provide invaluable data for assessing satellite anomalies using instruments on both the GOES satellites in geosynchronous orbit and POES satellites in low-Earth orbit. The instruments on these satellites, the products derived from them, and services for accessing and using the data are continuously being updated to better serve the user community. Here we present the current status of the instruments, data, and products and discuss plans for upcoming improvements and changes. In addition to providing data improvements, NOAA will build on its tools and products for assessing satellite anomalies. New resources will include density and temperature values for understanding and modeling surface charging, the Space Environmental Anomalies Expert System Real Time (SEAESRT) for characterizing satellite charging hazards, environmental assessment packages for large events, and a new portal for disseminating data related to satellite anomalies.

Important Conclusions: The space radiation environment poses a significant threat to satellites operating in near Earth space. The NGDC and SWPC are working together to provide more complete services for understanding and mitigating satellite anomalies related to the

environment including real time alerts as well as data and products for post-anomaly assessment.

Significance for management: NOAA provides an essential service for safeguarding the worlds' critical satellite infrastructure from the destructive effects of space weather. Data from the NOAA's GOES and POES satellites and the higher level products derived from this data provide satellite operators and designers with essential information for mitigating anomalies caused by the harsh space radiation environment.

3. OTHER REPORTS, BOOK CHAPTERS, AND INTERNAL PUBLICATIONS

None.