

Project Title: Developing socio-economic indices of fishing community vulnerability and resilience for Alaska.

Associated NMFS Science Center(s)/Regional Office(s)

- Principal Investigators: Amber Himes-Cornell and Steve Kasperski (AFSC, Economics and Social Science Research Program)

Industry and University Partners

- Fishing industry and community organizations to be identified (see below for explanation)
- University of Rhode Island (URI) - Department of Marine Affairs
- University of Alaska, Fairbanks (UAF) - School of Fisheries and Ocean Sciences
- University of Washington (UW) – School of Marine Affairs
- Pacific States Marine Fisheries Commission

Background and justification: Fishing communities exist within a larger coastal economy. Therefore, the ability to understand the context of vulnerability to social factors outside of fishing is critical to understanding how regulatory change will be absorbed into these multifaceted communities. Creating social indicators of vulnerability for fishing communities provides a pragmatic approach toward standardization of data and analysis for assessment of some of the long term effects of management actions. Historically, the ability to conduct such analysis has been limited due to a lack of quantitative social data. Over the past two years, social scientists working in NOAA’s Alaska, Northeast (NE) and Southeast (SE) regions have been engaged in the development of indices for evaluating aspects of fishing community vulnerability and resilience to be used in the assessment of the social impacts of proposed fishery management plans and actions (Colburn and Jepson, 2012). In addition, a social scientist at the Northwest Fisheries Science Center is in the early stages of developing similar indicators for the west coast. The Northeast Fisheries Science Center (NEFSC) and Southeast Regional Office (SERO) have developed a set of social indices using secondary data for nearly 3,000 coastal communities in the Eastern U.S. and Gulf Coast (Jepson and Colburn, *In prep*). The Alaska Fisheries Science Center (AFSC) has developed similar indices for over 500 communities in Alaska. These social indices are intended to improve the analytical rigor of fisheries Social Impact Assessments (SIAs), through analysis of adherence to National Standard 8 (NS8) of the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (MSRA) and Executive Order 12898 on Environmental Justice (EJ) in components of Environmental Impact Statements (EISs). Given the often short time frame in which such analyses are often conducted, an advantage to the approach taken by the Principal Investigators is that the majority of the data used to construct these indices are readily accessible secondary data and can be compiled quickly to create measures of social vulnerability and to update community profiles.

While success has been achieved in the NE and SE for developing comparable indices between these regions, initial comparisons indicate that resource, structural and infrastructural differences between these regions and Alaska and will require modifications of each of the indices to make them strictly comparable. The objective of the proposed research is to incorporate stakeholder feedback to adapt the current methodology so that a new set of indices can be created that will enable comparisons between Alaska and other regions, eventually leading to a nationwide analysis. This will allow cross regional analysis of fishing community vulnerability and resilience and testing of the validity of the results through in-community education and outreach. Modifications to the methodology will be made based on community feedback. Funding for this project will support in-community education and outreach to evaluate the results and to facilitate collaboration between AFSC and fishing industry partners.

Methodology: This research will use a community panel approach (Hall-Arber 2008) to gather valuable information from members of coastal fishing communities in Alaska to validate the aforementioned set of quantitative social indicators. Communities to be included in the proposed analysis will be selected using a statistical methodology for classifying coastal fishing communities for sampling purposes (Smith et al. 2011). Indices for all communities included in the analysis will exhibit varying levels of social vulnerabilities (e.g., poverty, labor force structure, and population composition vulnerability and involvement in various types of fishing). Using factor scores for communities from each discrete socio-economic index, cluster analysis will be used to create a taxonomy of fishing communities in Alaska. Each cluster of communities will represent a unique set of shared characteristics (Smith et al. 2011). For example, scores for one cluster may indicate a high degree of involvement in commercial fishing and be characterized by a strong labor force, low poverty, and low population composition vulnerability, while another cluster may exhibit opposite characteristics. This method makes it possible to systematically select communities with a wide range of involvement in fishing activities and exhibiting varying degrees of social vulnerability. In addition, this method lowers the overall costs of research by allowing the in-depth study of only one community in each cluster while still providing consistent results. Communities that cluster together are similar enough to achieve consistent results from the community panel approach within each cluster, which will reduce the cost of data collection while still achieving the same level of diverse community participation. University of Rhode Island personnel will conduct the cluster analysis with support from the Principal Investigators.

Industry Collaborators: Using the taxonomy results as a framework, regional fishing industry and community organizations will be consulted to provide guidance on the communities selected to participate in the project and to identify a regional coordinator. The Principal Investigators will identify regional coordinators through existing contacts with fishing and community organizations, such as the Association of Village Council Presidents, Gulf of Alaska Coastal Communities Coalition, Southwest Alaska Municipal Conference, Kawerak Inc. (a group representing Native Alaskan fishing interests), United Fishermen's Association, and the Alaska Charter Association. In addition, graduate students from the university partners and a local community liaison from each community will be hired to assist the regional coordinator in recruiting panel members and organizing the logistics of community panels.

The Principal Investigators will oversee implementation of the project. The Principal Investigators will be responsible for training the regional coordinators in the background and objectives of the project and prepare them to organize and facilitate a community panel in each community. Each regional coordinator will identify and work with local community liaisons to recruit 10 to 12 residents to participate in a panel in each community. Panel members will represent a cross section of vessel owners, vessel captains, crew members, processors, processor workers, shoreside business owners, and other relevant community members and will receive a stipend for their participation. Once the selection process is completed, two meetings will be scheduled with each community panel. The first meeting will include a section on education and outreach that will inform panel members about the project and discuss the concepts of vulnerability and resilience for coastal communities. Panel members will be asked to complete a brief questionnaire that will provide information on individual perceptions of the characteristics of their community's vulnerability and resilience. Likert scales (strongly agree to strongly disagree) will be used for several questions and will allow for statistical analysis and comparison with the quantitative indicators previously developed. This will be followed by a panel discussion of the local significance of these concepts and how this information may be effectively incorporated into assessments of the impact of changes in fisheries management regulations

on communities. This method of collaboration between social scientists and community stakeholders is effective in incorporating local knowledge that would otherwise be missed using traditional research methods alone (Hall-Arber 2007).

After the first meeting, the community panel participants' answers to the questionnaire will be analyzed and compared to the current set of social indicators developed by AFSC. A second meeting with each community panel will then present both the results of the questionnaire and the social indicators that AFSC has developed for that community specifically and region as a whole. A guided discussion by the regional coordinator with panel members will address the similarities or differences between the two assessments of the community and will provide additional outreach to panel members regarding how the results of this project will be used to improve fisheries management. Community liaisons and members will receive compensation for participation in the community panels. The results of each of the community panel meetings will be compiled and used to inform any necessary adjustments to the suite of quantitative social indices that AFSC has developed. The final report will be disseminated to community members and the North Pacific Fishery Management Council. The report will be written in language accessible to a general audience.

Linkage to Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (MSRA) of 2006 Section 318 Priority Area(s): The MSRA requires fishery management actions to provide the optimum yield from a fishery in a manner fair and equitable to all fishermen while providing for the sustained participation of fishing communities and, to the extent practical, minimizing adverse economic impacts on such communities [MSRA §301]. The information and considerations needed for these requirements are described in MSRA §303. In particular §303(a)(9) requires a fishery impact statement to “assess, specify, and analyze the likely effects... including cumulative conservation, economic and social impacts of the conservation and management measures on ... (A) participants in the fisheries and fishing communities affected..., (B) participants in the fisheries conducted in adjacent areas...”. MSRA §312(a) requires an assessment of the economic and social effects of a commercial fishery. MSRA §315 specifies the sectors of the fishing industry to be studied —fishermen, charter fishing operators, U.S. fish processors, and owners of related fishery infrastructure— when affected by a regional fishery disaster. Therefore, research priorities are outlined for specific programs like the Cooperative Research Program (CRP) where MSRA §318(c)(v) specifies that funds shall be provided for priorities which include, “projects designed to collect and compile economic and social data.” Furthermore the CRP requires that, “programs be implemented on a regional basis and shall be developed and conducted through partnerships among Federal, State, Tribal managers and scientists (including interstate fishery commissions), fishing industry participants, (including use of commercial, charter or recreational fishing vessels for gathering data) and educational institutions” (MSRA §318(a)). The proposed research project will include Federal, university and industry partnerships to collect socio-economic information from fishing communities to achieve the above mentioned goals and requirements of the MSRA.

National applicability/implementation that cuts across regions: The tools developed as a product of the proposed project have national applicability in three respects. **First**, the development of these indicators has become a national priority by the NOAA Fisheries Science and Technology Division, the result of which will be a scientifically sound methodology that will improve the analytical rigor of SIAs, NS8, and EJ analyses at a national level. **Second**, other regions are working on or have proposed similar projects, which will lead to inter-regional collaboration within NOAA. **Third**, the proposed research will improve the institutional capacity of NOAA to address the goals of Healthy Oceans and Resilient Coastal Communities as outline in the NOAA Next Generation Strategic Plan - Version 4, specifically with regard to providing coastal decision-makers with accurate and reliable tools to apply

toward reducing the vulnerability of their communities. More specifically, with the growing emphasis on ecosystem-based management, there is an expanding need for measures of social well-being and sustainability, including vulnerability and resilience for coastal fisheries and fishing communities.

Budget: \$85,990

Timeframe: 12 months from start to end of project, the start date would be dependent on receipt of funding and the timing of approval of the community panel questionnaire by the Office of Management and Budget.

Contractual: Fishing Industry Organizations to be indentified based on results of cluster analysis		Itemized Cost	Total Cost
Alaska	Industry regional coordinator stipend	\$12,000	
	Industry regional coordinator travel/per diem for community panels (5 communities x 2 trips x \$1,500/trip)	\$15,000	
	Community liaison (\$400/day x 4 days)	\$1,600	
	12 Community panel participants (\$200/day x 4 days)	\$9,600	
	Miscellaneous meeting supplies and meeting room rental	\$1,000	
<i>TOTAL Alaska industry compensation</i>			\$36,200
Contractual: Academic		Itemized Cost	Total Cost
URI	Richard Pollnac travel/per diem 1 community per region	\$3,000	
	URI overhead 26%	\$780	
<i>URI Total</i>			\$3,780
UW	Graduate student hourly wage	\$5,000	
	University overhead (26%)	\$1,300	
<i>UW Total</i>			\$6,300
UAF	Graduate student hourly wage	\$5,000	
	University overhead (34.2%)	\$1,710	
<i>UAF Total</i>			\$6,710
<i>TOTAL CONTRACTIAL: Academic</i>			\$16,790
NMFS personnel		Itemized Cost	Total Cost
NOAA personnel travel and per diem for community outreach panels (5 communities x 2 trips \$3,000 per community in AK)		\$30,000	
			\$30,000
Leveraged funds			
<ul style="list-style-type: none"> • Salary and fringe benefits for 2 NOAA Fisheries staff (at AFSC) for the equivalent of 1,000 total hours for project preparation, coordinating the project and working with the regional coordinator are provided in-kind. • Salary for Richard Pollnac (URI) for 100 hours will be provided in-kind. 			
TOTAL BUDGET			\$82,990

References

- Colburn, Lisa L. and Michael Jepson. 2012. Social Indicators of Gentrification Pressure in Fishing Communities: A Context for Social Impact Assessment. *Coastal Management*, Vol. 40:289-300.
- Hall-Arber, M. 2008. The Community Panels Project: Citizen's Groups for Social Science Research and Monitoring. *NAPA Bulletin* 28:148-162.
- Jepson, Michael and Lisa L. Colburn. *In prep.* Development of Social Indicators of Fishing Community Vulnerability and Resilience in the U.S. Southeast and Northeast Regions. Draft technical memorandum under review.
- Smith, Sarah L, Richard B. Pollnac, Lisa L. Colburn and Julia Olson. 2011. Classification of Coastal Communities Reporting Commercial Fish Landings in the Northeast Region: Developing and Testing a Methodology. *Marine Fisheries Review* 73(2).

AMBER HIMES-CORNELL

National Marine Fisheries Service, Alaska Fisheries Science Center
7600 Sand Point Way NE, Seattle, WA 98012. Tel. (206) 526-4221. Email: amber.himes@noaa.gov

RECENT RESEARCH EXPERIENCE AT NOAA FISHERIES

- **Organized a complete update and revision of *Community Profiles for North Pacific Fisheries – Alaska***, including stakeholder input meetings, end-user interviews, data collection and organization, profile template design, training and supervision of a team of 4 research assistants, review and edits to 195 community profiles, and outreach activities to promote and distribute the profiles.
- **Coordinated, implemented and contributed to numerous research projects**, including:
 - Participating in a nationwide assessment of the overall vulnerability and resilience of fishing communities and assessing the level of dependence on and engagement in fishing of Alaskan fishing communities and how community involvement changes over time.
 - Analyzing the effects of Alaska's Community Development Quota Program on the resilience of communities in Western Alaska to respond to climate change.
 - Designing, testing and implementing an annual cost and earnings survey to collect economic information from the charter fishing sector.
 - Analyzing the challenges and opportunities related to engaging Alaskan fishing communities in fisheries management, including designing, testing and fielding surveys with 195 Alaskan fishing communities and 172 fish processing plants.
 - Collected and analyzed data for a study of the demographic differences between fishing communities in the Bering Sea and Aleutian Islands.
- **Obtained approval from the Office of Management and Budget for numerous surveys** in compliance with the Paperwork Reduction Act.

EDUCATION

Ph.D. Natural Resource Management and Fisheries Economics, University of Portsmouth, 2005

M.E.M. Coastal Environmental Management, Duke University, 2002

B.A. Marine Science, University of San Diego, 1999, *cum laude*

PUBLICATIONS AND MANUSCRIPTS IN PREPERATION

- **A. Himes-Cornell** and S. Kasperski (*In prep*). Using indicators to aid in the assessment of vulnerability and resiliency in Alaskan fishing communities. To be submitted to Marine Policy.
- C. Carothers, K. Criddle, C.P. Chambers, P.J. Cullenberg, J. Fall, **A. Himes-Cornell**, J.P. Johnsen, N. Kimball, C. Menzies, and E.S. Springer (eds.). 2012. Fishing People of the North: Cultures, Economies, and Management Responding to Change. Alaska Sea Grant, University of Alaska Fairbanks.
- **Himes-Cornell, A.**, C. Package, and A. Durland (2011). Improving community profiles for the North Pacific fisheries. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-230, 85 p.
- Lew, D.K. and A. Himes-Cornell (2011). A guide to designing, testing, and implementing Alaska Fisheries Science Center economic and social surveys. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-228, 43 pages.

PROFESSIONAL ACTIVITIES

- Affiliate Assistant Professor at the School of Marine and Environmental Affairs, University of Washington, Seattle, WA (June 2012–present) and Affiliate Professor at Central Washington University, College of the Sciences, Resource Management Program (May 2011–present)
- IUCN Commission on Environment, Economics & Social Policy (2005 to present)

STEPHEN KASPERSKI

National Marine Fisheries Service, Alaska Fisheries Science Center
7600 Sand Point Way NE, Seattle, WA 98012. Tel. (206) 526-4727. Email: Stephen.kasperski@noaa.gov

RECENT RESEARCH EXPERIENCE AT NOAA FISHERIES

Current Position - 2009-Present: Industry Economist, NMFS, Alaska Fisheries Science Center,

- Conduct research in fisheries economics and advise the North Pacific Fisheries Management Council on relevant issues.
- Adapt statistical techniques to assess community vulnerability and resiliency to a wide variety of risk factors such as the implementation of catch shares programs, market shocks, stock collapse, broad economic trends, changes in fisheries management, natural or man-made disaster, demographic shifts, climate change, and other factors affecting the community.

EDUCATION

Ph.D. Agricultural and Resource Economics, University of Maryland, College Park, 2011.

M.S. Agricultural and Resource Economics, University of Maryland, College Park, 2009

B.A. Economics, Colby College, 2005 *magna cum laude*

PUBLICATIONS AND MANUSCRIPTS IN PREPERATION

- **Kasperski, Stephen** and Robert Wieland. 2009. "When is it Optimal to Delay Harvesting? The Role of Ecological Services in the Chesapeake Bay Oyster Fishery." *Marine Resource Economics* 24(4): 361-385.
- Lipton, Douglas and **Stephen Kasperski**. 2009. Estuarine Restoration and Commercial Fisheries. In: Pendleton, Linwood H. ed., *The Economic and Market Value of Coasts and Estuaries: What's at Stake?*, Coastal Ocean Values Press, Arlington, VA.
- Amber Himes-Cornell and **Stephen Kasperski**. Using indicators to assess the vulnerability and resiliency of Alaskan communities to climate change. *In prep.*
- **Kasperski, Stephen**. The Impact of International Trade on Biodiversity. *Under review at JEEM.*
- **Kasperski, Stephen**. Optimal Multispecies Harvesting in Ecologically and Economically Interdependent Fisheries. *Under review at JEEM.*
- **Kasperski, Stephen**. Optimal Multispecies Harvesting in the Presence of a Nuisance Species. *Under review at Ecological Economics.*
- **Kasperski, Stephen** and Dan Holland. Income Diversification and Risk for Fishermen. *Under review at PNAS.*
- **Kasperski, Stephen.**, S. Gmur, A. Haynie, and C. Fauce. Understanding the Usefulness of Logbook Data in Fisheries Management in Alaska. *Working Paper.*
- Finnoff, David, **Stephen Kasperski**, and John Tschirhart. Optimum Multi-Species Harvesting with Joint Production and Joint Determination within the Ecosystem. *Working Paper.*

PROFESSIONAL ACTIVITIES

- Committee Participation: National Marine Fisheries Service Social Indicators Working Group, National Marine Fisheries Service Catch Shares Working Group, ICES Study Group on Integration of Economics, Stock Assessment and Fisheries Management (SGIMM), NOAA Integrated Ecosystem Assessment.