

The annotated bibliography is in support of four working papers:

1. Redstone Strategy Group and Environmental Defense, 2006a. *Assessing the Potential for DAPs in U.S. Fisheries: Field Assessment of Representative DAPs: Output I Report*. Working paper, October.
2. Redstone Strategy Group and Environmental Defense, 2006b. *Assessing the Potential for DAPs in U.S. Fisheries: Analysis of Implementation Issues: Output II Report*. Working paper, October.
3. Redstone Strategy Group and Environmental Defense, 2006c. *Assessing the Potential for DAPs in U.S. Fisheries: DAP Design: Output IIIa Report*. Working paper, October.
4. Redstone Strategy Group and Environmental Defense, 2006d. *Assessing the Potential for DAPs in U.S. Fisheries: DAP Selection and Implementation: Output IIIb Report*. Working paper, October.

ANNOTATED BIBLIOGRAPHY

1. Adelaja, A., Menzo, J., McCay, B., 1998. *Market Power, Industrial Organization, and Tradeable Quotas*. *Review of Industrial Organization* 13: 589-601. Individual Transferable Quotas (ITQs) were introduced into the Mid Atlantic Surf Clam and Ocean Quahog fishery to reduce overcapitalization while conserving clam populations. Because the number of operators in the fishery declined drastically since the introduction of this policy, there is concern about its effect on competitiveness. This paper utilizes Bertrand Pricing Models to show that monopoly power is absent from the surf clam and ocean quahog markets. Concentration ratios, Lorenz curves and Gini Coefficients estimated for the fishery for periods before and after ITQ introduction support the results of the Bertrand model.
2. AK regional office of NMFS, 2003. *Report to the Fleet October 2003*. <http://www.fakr.noaa.gov/ram/rtf03.pdf>. Yearly report to the Alaska halibut and sablefish fleet, including data on port landings, on loans for fishermen, fleet concentration, safety, vessel owners, and cost recovery. The report contains information about the 2004 IFQ season, reviews 2003's season, provides information on IFQ program performance, and discusses some developments that may affect the program.
3. AK regional office of NMFS, 2006a. *Steller Sea Lion Protection Areas Pollock Fisheries Restrictions*. Retrieved May 15, 2006, from <http://www.fakr.noaa.gov/rr/tables/tab14.pdf>. Alaska pollock fishing restricted zones to protect pollock biomass for steller sea lions.
4. AK regional office of NMFS, 2006b. *Bering Sea and Aleutian Islands Management Area Pollock Seasons, 1991-2003*. Retrieved March 17, 2006, from

- <http://www.fakr.noaa.gov/sustainablefisheries/plckseas.pdf>. Length of Alaska pollock fishing season from 1991 through 2003.
5. AK regional office of NMFS, 2006c. *2005-2006 Alaska Groundfish Harvest Specification Tables*. Retrieved June 12, 2006, from <http://www.fakr.noaa.gov/sustainablefisheries/2005hrvstspecs.htm>. Harvest specifications (including CDQ allotments) for pollock, sablefish, and halibut.
 6. AK regional office of NMFS, 2006d. *2005-2006 Alaska Crab Rationalization Program: Overview, FAQs, and Community Protection Measures*. Retrieved June 12, 2006, from <http://www.fakr.noaa.gov/sustainablefisheries/crab/rat/progfaq.htm>. Overview of the Alaska crab rationalization program, including ownership rules, trading rules and community protection measures.
 7. AK regional office of NMFS, 2006e. *Frequently asked questions about Vessel Monitoring Systems (VMS)*. Retrieved June 12, 2006, from http://www.nmfs.noaa.gov/ole/ak_faqs.html. Requirements on VMS in Alaska groundfish fisheries.
 8. AK regional office of NMFS, halibut statistics 2006. *IFQ landings*, Retrieved March 17, 2006, from <http://www.fakr.noaa.gov/ram/ifq.htm>, e.g. <http://www.fakr.noaa.gov/ram/95ifqlnd.txt>. Landings and TAC of Alaska halibut and sablefish from 1995 through 2005.
 9. AK regional office of NMFS, groundfish statistics 2006. *Annual catch statistics, regional catch reports*, Retrieved March 17, 2006, from <http://www.fakr.noaa.gov/sustainablefisheries/catchstats.htm>, e.g. http://www.fakr.noaa.gov/2003/car110_bsai.pdf. Landings and TAC of Alaska groundfish (pollock and sablefish) from 1993 through 2005.
 10. Alverson, D., Freeberg, M., Murawski, S., Pope, J., 1996, *A global assessment of fisheries bycatch and discards*. FAO Fisheries Technical paper 339. The authors have examined several hundred articles concerned with bycatch and discards in world fisheries. Over 800 papers containing quantitative and qualitative information were used to characterize the nature and scope of regional and global bycatch problems. Mortalities associated with discarding practices were also reviewed. Case studies are provided for bycatch and discard problems in the Northeast Pacific, as well as the Northeast and Northwest Atlantic. Bycatch and bycatch issues have been intensively studied in these locations relative to other areas. In the Northeast Pacific, a suite of fisheries produces a bycatch total exceeding one billion individuals annually. Impacts appear low on most species except the Pacific halibut and possibly king and Tanner crab.
 11. Archipelago Marine Research, 2006. *Electronic Monitoring of BC Area A Crab Fishery*. Retrieved September 27, 2006 from <http://www.archipelago.ca/highlight.aspx?ID=CF3EA83A-DB53-4F69-B787-3F7AEF432C2B>. The Area 'A' crab fishery, involves a fleet of about 50 vessels fishing for Dungeness crab in northern British Columbia. During the 1990's, the crab fishery markedly intensified in terms of catch, the number of vessels involved and amount of trap gear deployed. In the 2000 fishery year, fisheries authorities implemented a trap limit program in order to bring the total gear in the fishery to below 36,000 traps. The

monitoring service is provided through the Area A Crab Association and there are strict requirements to ensure fishers comply with the rules. During a fishing trip, fishers must keep the EM system unit continuously powered, not interfere with any of the sensors, and scan all traps when hauled. After three years of operation support for the Area A Crab fishery monitoring program is very high. License holders balloted in December 2002 overwhelmingly supported a continued requirement for electronic monitoring in their fishery. Including the capital cost of the equipment and subsequent annual program expenses, the average annual cost for the monitoring service is about \$10 CDN per trap, or less than 20% the cost of an at-sea observer program.

12. [Atlantic Coastal Cooperative Statistics Program \(ACCSP\), 2006](http://www.accsp.org). Data retrieved September 10, 2006 from <http://www.accsp.org>. The ACCSP is a cooperative state-federal program to design, implement, and conduct marine fisheries statistics data collection programs and to integrate those data into a single data management system that will meet the needs of fishery managers, scientists, and fishermen. Custom data inquiry for number of vessels landing each species.
13. [Atlantic States Marine Fisheries Commission \(ASMFC\) 1997. *Fishery Management Report No. 29*. December](#). Includes information on vessels for Atlantic state fisheries, including lobster.
14. [At-Sea Processors Association. 2006 \(APA\). *A Case Study of Fish Harvesting Cooperatives: The Pacific Whiting Conservation Cooperative \(PWCC\)*](http://www.atsea.org/concerns/pwcc.html). <http://www.atsea.org/concerns/pwcc.html>. In 1997, participants in the catcher/processor sector of the West Coast Pacific whiting fishery formed the Pacific Whiting Conservation Cooperative (PWCC) to reduce the bycatch and increase yields from the harvest of Pacific whiting. In only its second year, this initiative has resulted in a 40% increase in processing yield for the most important product made from whiting and significantly lower bycatch, particularly of yellowtail rockfish. The report also details number of operators, fleet rationalization and improved working conditions.
15. [Berman, M., Leask, L., 1994. *On the Eve of IFQs: Fishing for Alaska's Halibut and Sablefish*. AK Review of Social and Economic Conditions](http://www.iser.uaa.alaska.edu/publications/formal/arsecs/arsec292p3.pdf), <http://www.iser.uaa.alaska.edu/publications/formal/arsecs/arsec292p3.pdf>. Report documenting the employment levels in the Alaska halibut and sablefish fisheries prior to ITQs.
16. [Blue crab, 2006. *Louisiana Recreational Crabbing*](http://www.blue-crab.net/recreational.html). Retrieved September 6, 2006 from <http://www.blue-crab.net/recreational.html>. Describes Louisiana recreational crabbing.
17. [Blue Ocean Institute, 2006. *Information on recovery potential*](http://www.blueocean.org). Retrieved August 17, 2006 from <http://www.blueocean.org>. Life spans and population doubling times of species.
18. [Branch, T., Rutherford, K., Hilborn, R. 2004. *Replacing trip limits with individual transferable quotas: implications for discarding*. Marine Policy December 2004](#). In the British Columbia groundfish fishery (BC fishery), full observer coverage and the accounting of discard mortality of marketable fish in landing limits resulted in low discard fractions. When individual transferable quotas (ITQs) were additionally introduced, total discard fractions declined for most species, and marketable discard fractions declined from 0.20% to 0.10%, after an adjustment period. In contrast, the US West Coast groundfish

fishery, which is regulated by 2-monthly landing limits, has higher discard fractions (31–43% vs. 14–19% for BC). The BC experience suggests that full observer coverage, ITQs, and mortality accounting would reduce West Coast discarding fractions, but severe catch restrictions on overfished West Coast species may limit such reductions.

19. Branch, T., Hilborn, R., Haynie, A., Fay, Flynn, Griffiths, Marshall, Randall, Scheuerell, Ward, Young. 2005. *Fleet dynamics and fishermen behavior: lessons for fisheries managers*. Under revision at the Canadian Journal of Fisheries and Aquatics Sciences. In the context of how to manage fisheries (practically), a case study of the Alaska halibut ITQ program shows many benefits including reduced ghost fishing, greater season length, and increased safety.
20. Bray, T., Gill, S., Edwards, R. 2006. *Assessment of Western Rock Lobster Strategic Management Options: How Do Quota Management Systems Work in Rock Lobster Fisheries?* Volume 4. Fisheries Management Paper No. 212. Department of Fisheries Western Australia. <http://www.fish.wa.gov.au/docs/mp/mp212/fmp212.pdf>. Quota management systems are now in place for the New Zealand, Tasmanian and South Australian rock lobster fisheries. New Zealand was the first to move to QMS (1989), followed by the Southern Zone of South Australia (1993), Tasmania (1998) and Northern Zone South Australia (2001). As part of a review of the system of management used for the West Coast Rock Lobster Fishery, a West Australian delegation visited New Zealand, Tasmania and South Australia in 2004 to learn more about the management systems in place for their respective rock lobster fisheries. The report documents history, fishery facts, access to the fishery (e.g. number of quota owners), sustainability (including TAC limits), and season for the three fisheries.
21. Bruckner, A. 2004. *Sea Cucumber Population Status, Fisheries and Trade in the United States*. Convention on International Trade in Endangered Species of Wild Fauna and Flora. March. Includes information on biology, and vessels in sea cucumber fishery.
22. California Department of Fish and Game (CADF&G) 2005a. *Dungeness Crab*. Annual Status of the Fisheries Report. Report includes information on recreational catch.
23. California Department of Fish and Game (CADF&G) 2005b. *Purple Sea Urchin*. Annual Status of the Fisheries Report. Report includes information on recreational catch.
24. California Fish and Game Commission (CAF&G) 2006. *Final statement of reasons for regulatory action re: commercial Tanner crab fishery provisions*. January 3, 2006. Cost of observers for crab fishery approximately \$300-350/day.
25. Casey, K., Dewees, C., Turriss, B., Wilen, J., 1995. *The Effects of Individual Vessel Quotas in the British Columbia Halibut Fishery*. Marine Resource Economics, Volume 10, pp. 211-230. Implementation of individual vessel quotas (IVQs) in the British Columbia halibut fishery has provided a unique opportunity to examine the effects of this management technique on a previously intense “derby” fisher. This paper describes the changes that have occurred in the fishery since the introduction of individual vessel quotas in 1991. The results presented here are largely based on the finding of two surveys. In September 1993, we conducted in-depth interviews with most of the major halibut processors in British Columbia. These processors reported significant changes in the

processing and marketing of halibut. In Spring 1994, we conducted a mail survey of all 435 licensed halibut fishermen. The survey consisted of several series of questions designed to measure changes in fishing operations (crew size, fishing practices, etc.), quota leasing activities, changes in fishing income, and opinions about the effects of IVQs. The results presented here provide important information about the effects of the British Columbia halibut IVQ program to date and will be useful for comparison to similar management programs implemented elsewhere.

26. [Catch statistic reports 1985-1995](http://www-sci.pac.dfo-mpo.gc.ca/sa/Commercial/HistoricStats_e.htm). Retrieved March 13, 2006, from http://www-sci.pac.dfo-mpo.gc.ca/sa/Commercial/HistoricStats_e.htm. Reports from the Department of Fisheries and Oceans, Canada provide catch statistics (landings, value, landings by month) on BC groundfish, BC halibut, and BC sablefish from 1985-1995.
27. Cieri, M., McCay, B., 2000. *Fishing Ports of the Mid-Atlantic*. Report to the Mid-Atlantic Fishery Management Council. April. Report including information on fishery dependent communities in the Mid-Atlantic.
28. Chuenpagdee, R., Morgan, L., Maxwell, S., Norse, E., Pauly, D., 2003. *Shifting gears: assessing collateral impacts of fishing methods in US waters*. *Front Ecol Environ* 2003; 1(10): 517-524. Problems with fisheries are usually associated with overfishing; in other words, with the deployment of “too many” fishing gears. However, overfishing is not the only problem. Collateral impacts of fishing methods on incidental take (bycatch) and on habitats are also cause for concern. Assessing collateral impacts, through integrating the knowledge of a wide range of fisheries stakeholders, is an important element of ecosystem management, especially when consensual results are obtained. This can be demonstrated using the “damage schedule approach” to elicit judgments from fishers, scientists, and managers on the severity of fishing gear impacts on marine ecosystems. The consistent ranking of fishing gears obtained from various respondents can serve as a basis for formulating fisheries policies that will minimize ecosystem impacts. Such policies include a shift to less damaging gears and establishing closed areas to limit collateral impacts.
29. Clark, W., Hare, S. 2005. *Assessment of the Pacific halibut stock at the end of 2005*. [International Pacific Halibut Commission](#). Each year the IPHC staff assesses the abundance and potential yield of Pacific halibut using all available data from the commercial fishery and scientific surveys. Exploitable biomass in each of IPHC regulatory areas 2B, 2C, 3A, 3B, 4A, and 4B is estimated by fitting a detailed population model to the data from that area, going back to 1974 in the eastern areas and to 1996 in Areas 3B and 4. Exploitable biomass in Area 2A is estimated by applying a survey-based estimate of relative abundance to the analytical estimate of biomass in Area 2B. In Area 4CDE the estimate of exploitable biomass is based on the NMFS trawl survey of the eastern Bering Sea shelf (available for the first time this year [2005]). The new 2005 estimate is the same as what the old estimation method would have produced. Coastwide exploitable biomass is little changed. Fishery CEY in Areas 4B and 4CDE is lower because of the adoption of a lower harvest rate in those areas. This report provides biomass information as well as historical catch information, historical halibut bycatch, and effort (CPUE data).

30. Clark, W., St-Pierre, G., 1997. *Estimates of Halibut Abundance from NMFS Trawl Surveys*. International Pacific Halibut Commission Technical Report No. 37. <http://www.iphc.washington.edu/HALCOM/pubs/techrep/tech0037.pdf>. This paper summarizes the development of IPHC catch limits and discusses the major elements of uncertainty in them, with special reference to the reliability of estimates of present abundance relative to the historical minimum.
31. Coastal Ecology Group, 1984. *Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates: Stone Crab*. March. Report includes information on recreational catch for stone crab.
32. Coast Guard 2006. *United States Coast Guard Maritime Information Exchange Incident Investigation Reports*. Retrieved September 12, 2006 from <http://cgmix.uscg.mil/IIR>. Number of injuries, fatalities, and high risk situations produced in each fishery by gear type from 100 Coast Guard incident reports from 2000-2006 that covered all commercial fisheries in the U.S.
33. Collie, J.S. et al. 2000. A quantitative analysis of fishing impacts on shelf-sea benthos. *Journal of Animal Ecology* 69:785-798. Summary at <http://seagrant.gso.uri.edu/fisheries/presentations/collie.pdf>. This analysis of 39 published fishing impact studies shows that intertidal dredging and scallop dredging have the greatest initial effects on benthic biota, while trawling has less effect. Fauna in stable gravel, mud, and biogenic habitats are more adversely affected than those in less consolidated sediments. Areas that are fished in excess of three times per year are likely to remain in a permanently altered state.
34. Coon, C., 2005. *Groundfish pelagic trawl fishing effort in the Eastern Bering Sea. Alaska Fishery Science Center, Ecosystem Considerations for 2006*. Retrieved May 15, 2006, from <http://access.afsc.noaa.gov/reem/ecoweb/ecochaptdataselect.cfm?ID=65>. Data covers the observed duration (number of 24 hour days) of the pelagic trawl (pollock trawl) from 1995-2004.
35. Daniel, L., 2005. *Testimony of Dr. Louis Daniel, Chairman South Atlantic Fishery Management Council on the Operations of the SAFMC and the Reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act*. House Committee on Resources, Oct. 27, 2005. <http://resourcescommittee.house.gov/archives/109/testimony/2005/louisdaniel.pdf>. Testimony on re-authorization includes stakeholder discussion in the MAFMC.
36. Donohue, K., Barker, E. 2000. *Information on Quota Management of Rock Lobster Fisheries in South Australia, Tasmania and New Zealand*. Fisheries Management Paper No. 138. Department of Fisheries Western Australia. <http://www.fish.wa.gov.au/docs/mp/mp138/fmp138.pdf>. This report provides an update on the information available to Western Australians on the quota management of Australasian rock lobster fisheries. The report keeps Government and industry abreast of developments in alternative management systems and, if necessary, reviews the WA management system. The report includes data on the history of quota, allocation, management and enforcement, concentration, economics of fishing, and resource sharing among the three (South Australia, Tasmania, and New Zealand) rock lobster fisheries.

37. Dorn, M., Fitzgerald, M., Guttormsen, M., Loefflad, M., 1995. *An Evaluation of North Pacific Groundfish Observer Program. Methods of Haul Weight Estimation*. NOAA Technical Memorandum NMFS-AFSC-56. August. Describes Alaska's groundfish observer program.
38. Dorn, M., Saunders, M., Wilson, C., Guttormsen, M., Cooke, K., Kieser, R., Wilkins, M., 1999. *Status of the coastal Pacific hake/whiting stock in U.S. and Canada in 1998*. Canadian Stock Assessment Secretariat Research Document 99/90. Stock assessment of Pacific whiting (hake) in both U.S. and Canadian waters for 1998. Includes historical data of landings (from 1966), TAC, ABC, on vessel owners, biomass (from 1972) and harvesting options.
39. EcoTrust. 2004. *Catch-22: Conservation, Communities and the Privatization of B.C. Fisheries*. Report investigates the economic, social and ecological impacts of federal fisheries licensing policy, especially those promoting individual fishing quotas (IFQs). The Department of Fisheries and Oceans (DFO) has implemented IFQs in the geoduck, halibut, sablefish, groundfish trawl and three shellfish fisheries. The report includes data on quota values of BC fisheries under DAPs.
40. Federal Register 2000. *Fisheries off West Coast States and in the Western Pacific; Pacific Coast Groundfish Fishery; Amendment 13*. Federal Register November 21, 2000, Volume 65, Number 225. Describes Amendment 13 to Pacific Coast groundfish fishery. Observer costs in the whiting fishery are ~\$250/day.
41. Federal Register 2001. *Fisheries off West Coast States and in the Western Pacific; Pacific Coast Groundfish Fishery; Amendment 13*. Federal Register June 1, 2001, Volume 66, Number 106. Describes Amendment 13 to Pacific Coast groundfish fishery. Observer costs in the Pacific Coast groundfish trawl would be \$300/day.
42. Federal Register, 2005. *2005 and 2006 Bering Sea Subarea Inshore Cooperative Allocations*. Vol. 70 No 168, Aug 31, 2005.
http://www.fakr.noaa.gov/sustainablefisheries/specs05_06/BSAITable10.pdf. Allocations to various inshore cooperatives and description of historical allocation.
43. Federal Register, 2006a. *List of Fisheries*. Federal Register, Vol. 71, No.78. April 24, 2006. List of fisheries, including information on marine mammal interactions.
44. Federal Register, 2006b. *List of Fisheries for 2006*. NOAA. Federal Register, Vol. 71, No.162. August 22, 2006. List of fisheries, including information on vessels.
45. Fishbase, habitat depths of fish species, 2006. Retrieved April 12, 2006, from <http://www.fishbase.org/search.php>. Database provides detailed information on all fish species, including data on habitat depths, environment (e.g. benthic or reef-associated), and resilience.
46. Fisheries and Oceans Canada, 1997. *Nova Scotian Sea Urchin Stock Status*. DFO Atlantic Fisheries Report 96/130E. Summary stock status report for sea urchin.
47. Fisheries and Oceans Canada, 2001. *News Release: 2001 Halibut Fishery Opens*. Retrieved June 15, 2006, from <http://www.pac.dfo-mpo.gc.ca/comm/pages/release/p->

- [releas/2001/nr024_e.htm](#). Description of 2001 halibut fishery, including TACs and TAC set aside for research.
48. Fisheries and Oceans Canada. *Extranet Topics: Management Plans, Groundfish*. Retrieved March 2, 2006, from <http://www-ops2.pac.dfo-mpo.gc.ca/xnet>. Current and historical fishery management plans for BC groundfish (1998-2007), halibut, and sablefish.
 49. Fisheries and Oceans Canada – Pacific Region. *Commercial Catch Statistics*. Retrieved March 2, 2006, from http://www-sci.pac.dfo-mpo.gc.ca/sa/Commercial/default_e.htm. Reports from the Department of Fisheries and Oceans, Canada provide catch statistics (landings, value, landings by month) on BC groundfish, BC halibut, and BC sablefish from 1996-2006.
 50. Fisheries and Oceans Canada – Pacific Region. *Integrated Fisheries Management Plan Groundfish April 1, 2006 to March 31, 2007*. http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/mplans/plans06/Groundfish06-07/Fnl%2006_07%20Groundfish%20IFMP.pdf. 2006-2007 fishery management plan for BC groundfish, including halibut and sablefish.
 51. Fisheries Information Service. 1998. *Discards in the Groundfish Fisheries of the Bering Sea/Aleutian Islands and the Gulf of Alaska, 1995-1997*. Prepared for the Alaska Department of Fish and Game (ADFG). This paper documents the amount and source of groundfish, crab, halibut, herring, and salmon discards resulting from the commercial groundfish fisheries in the Bering Sea/Aleutian Islands, and the Gulf of Alaska during the calendar years of 1995, 1996, and 1997, including a specific breakout of Community Development Quota catch and discards. Discards related to the direct commercial fisheries for crab and halibut are not identified.
 52. Fisheries Information Service. 2002. *Discards in the Groundfish Fisheries of the Bering Sea/Aleutian Islands and the Gulf of Alaska, 1998-2000*. Prepared for the Alaska Department of Fish and Game (ADFG). This report updates the 1998 Alaska Department of Fish and Game (ADF&G) sponsored report, Discards in the North Pacific Groundfish Fisheries 1995-1997. It documents the amounts and sources of groundfish, crab, halibut, herring and salmon discards in commercial groundfish fisheries in the Bering Sea/Aleutian Islands (BSAI) and the Gulf of Alaska (GOA) during calendar years 1998, 1999 and 2000, including a specific breakout of Community Development Quota catch and discards.
 53. Fisheries Information Services. 2003a. *Discards in the North Pacific Groundfish Fisheries 2001*. Prepared for Alaska Marine Conservation Council. This report updates the 2002 Alaska Department of Fish and Game (ADF&G) sponsored report, Discards in the North Pacific Groundfish Fisheries 1998-2000. It documents the amounts and sources of groundfish, crab, halibut, herring and salmon discards in commercial groundfish fisheries in the Bering Sea/Aleutian Islands (BSAI) and the Gulf of Alaska (GOA) during calendar year 2001, including a specific breakout of Community Development Quota catch and discards.
 54. Fisheries Information Services. 2003b. *Discards in the North Pacific Groundfish Fisheries 2002*. Prepared for Alaska Marine Conservation Council. This report documents the amounts and sources of groundfish, crab, halibut, herring and salmon discards in

- commercial groundfish fisheries in the Bering Sea/Aleutian Islands (BSAI) and the Gulf of Alaska (GOA) during calendar year 2002, including a specific breakout of Community Development Quota catch and discards.
55. [Fisheries Information Service. 2004. *Discards in the North Pacific Groundfish Fisheries 2003*. Prepared for the Alaska Marine Conservation Council.](#) This report documents the amounts and sources of groundfish, crab, halibut, herring and salmon discards in commercial groundfish fisheries in the Bering Sea/Aleutian Islands (BSAI) and the Gulf of Alaska (GOA) during calendar year 2003, including a specific breakout of Community Development Quota catch and discards.
 56. [Gaichas, S., Fritz, L., and Ianelli, J. 1999. *Other Species Considerations for the Gulf of Alaska*. Alaska Fisheries Science Center. National Marine Fisheries Center.](#) This first assessment of Gulf of Alaska Other species (including sharks, skates, sculpins, smelts, octopi, and squids). The purpose of the report is to highlight some of the available data for these species and develop some approaches toward evaluating the harvest levels and resource abundances. Input data included catch estimates by species group from 1990-1998, and 1984-1999 GOA triennial trawl survey biomass estimates for each species group. The report provides catch history and biomass estimates for the Other species.
 57. [Gaichas, S. 2002. *Summary of Changes in the Bering Sea – Aleutian Islands Squid and Other Species Assessment*. Alaska Fisheries Science Center. National Marine Fisheries Center.](#) This report updates the species assessments for Other species (including sharks, skates, sculpins, smelts, octopi, and squids) for 2002. The report provides catch history, ABC, TAC recommendations and biomass estimates for the Other species.
 58. [Gaichas et al. 2004. *Bering Sea Aleutian Islands Squid and Other Species Stock Assessment*. Alaska Fisheries Science Center. National Marine Fisheries Center.](#) This report updates the species assessments for Other species (including sharks, skates, sculpins, and squids) for 2004. The report provides catch history, ABC, TAC recommendations and biomass estimates for the Other species. Survey biomass data are updated with 2004 EBS shelf, slope and AI bottom trawl survey results. Considerable information on life history, distribution, current research, and biodiversity for each species group within this complex has been added.
 59. [General Accounting Office \(GAO\). 2002. *Individual Fishing Quotas. Better Information Could Improve Program Management*. Report to the Chairman and Ranking Minority Member, Subcommittee on Oceans, Atmosphere, and Fisheries, Committee on Commerce, Science, and Transportation, U.S. Senate.](#) GAO did this study to assist in deliberations on individual fishing quota (IFQ) programs, GAO determined (1) the extent of consolidation of quota holdings in three IFQ programs (Alaskan halibut and sablefish, wreckfish, and surfclam/ocean quahog); (2) the extent of foreign holdings of quota in these programs; and (3) the economic effect of the IFQ program on Alaskan halibut and sablefish processors.
 60. [Getchis, T. 2005. *An Assessment of the Needs of Connecticut's Shellfish Aquaculture Industry*. Sea Grant Connecticut Aquaculture Bulletin No.1.](#) Includes information on shellfish vessels.

61. [Gislason, GS, 2002. *BC Seafood and Recreational Fishing SWOT*](#). This report summarizes BC fisheries and their management regime, average crew size, vessels, average effort, and historical catch statistics (landings, value 1993-2002).
62. [Grafton, R., Nelson, H., Turriss, B. 2004. *How to Resolve the Class II Common Property Problem? The Case of the British Columbia's Multi-Species Groundfish Trawl*](#). Report addresses many issues surrounding the BC groundfish trawl fishery including history, IVQ management details, historical catch, discards, quota pricing and trawl effort. It is 20 years since Munro and Scott identified the causes and possible remedies for the dissipation of rents in fisheries. We analyze one of the solutions proposed by Munro and Scott by using insights from the British Columbia multi-species groundfish trawl fishery that has used ITQs since 1997. The history of this fishery shows that even the most difficult management problems including by-catch, equity concerns, concentration of quota holdings and vessel overages can be mitigated with the appropriate mix of incentives, monitoring and enforcement.
63. [Groundfish Trawl Special Industry Committee, 1999. *Review of the Groundfish Trawl Individual Vessel Quota/ Groundfish Development Authority Plan*](#). <http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/groundfish/GFTrawl/paper.pdf>. The Individual Vessel Quota / Groundfish Development Authority (IVQ / GDA) plan, introduced in April 1997, brought wholesale change to the groundfish trawl industry. The terms of the IVQ / GDA plan were arrived at after a lengthy process including public consultations, meetings with the Groundfish Trawl Advisory Committee (GTAC), and the formation of the Groundfish Trawl Special Industry Committee (GSIC) to develop the details of the plan. The plan, as implemented, represented a formal agreement between GSIC signatories – an agreement arrived at after negotiation and compromise by the fishermen, processor, union, community, and government representatives comprising the sub-committee. Seeking to achieve conservation, economic, and social objectives, the plan contained unique and innovative provisions. While attempting to restore the fishery to economic viability and a sound conservation footing, the plan also sought to allow a “controlled” rationalization of the fleet, while avoiding the pitfalls associated with other IVQ plans. Of particular concern at the time of plan implementation was the potential negative impact of allowing quota to be freely transferred between vessels: widespread quota “leasing” and undue quota concentration. In order to allow industry participants time to adjust their initial quota holdings to their desired “long term” package – whether this meant buying, selling, trading, specializing, regionalizing, etc. – one-way quota transfers were to be permitted for a two-year transitional period. After 2½ years under the IVQ / GDA system, the groundfish industry has had an opportunity to adapt and adjust its operating practices to the plan. While sufficient experience with the plan has been gained to allow a reasonable evaluation to be conducted, the plan is still new enough that its every provision has not yet become entrenched in industry’s daily routine. The prospect of a moratorium on quota transfers looms large in the industry. The fall of 1999 therefore provides a timely opportunity for review of the IVQ / GDA plan.
64. [Gulf of Mexico Fishery Management Council \(GMFMC\), 2004. *Final Amendment 15 to the Fishery Management Plan for Coastal Migratory Pelagic Resources in the Atlantic and Gulf of*](#)

- Mexico*. November. Includes information on regulatory rules, biology and vessels for Gulf of Mexico pelagics.
65. Gulf of Mexico Fishery Management Council (GMFMC), 2005. *Final Amendment 18A to the Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico*. October. FMP, vessel information, and regulations for reef fish in Gulf of Mexico.
 66. Gulf of Mexico Fishery Management Council (GMFMC), 2006a. *Fishery Regulations for 1) Shrimp 2) Red Drum, and 3) Stone Crab*. Retrieved March 15, 2006, from <http://www.gulfcouncil.org/>. Current and historical fishery management regulations for specified fisheries.
 67. Gulf of Mexico Fishery Management Council (GMFMC), 2006b. *Options Paper: Amendment 15 to the Shrimp Fishery Management Plan*. May. Gulf of Mexico shrimp FMP.
 68. Haggan, N., Beattie, A., 1999. *Back to the Future: Reconstructing the Hecate Straite Ecosystem*. Volume 7 Number 3. Fisheries Centre, University of British Columbia. Report includes data on discards for the BC groundfish trawl for 1996-1997. Participants gathered at a workshop held in Prince Rupert, May 20 and 21 1998, to discuss changes to the Hecate Strait ecosystem. Hecate Strait is defined here as DFO statistical areas 5C and 5D and includes Dixon Entrance. A preliminary mass-balance model of Hecate Strait in the early 1900s was constructed from information provided by participants, and a preliminary mass-balance model representing the same area during the early 1990s. Changes in biomass from the previous model were based on input from workshop participants. Thus, it presents a test of whether ECOPATH can be used to develop a picture of how the ecosystem looked based almost entirely on local knowledge. Unless otherwise noted, biomass values were adjusted according to the consensus of the workshop participants. Most changes in biomass ranged from a 25% to a 100% increase, back through time. Where information was lacking, ECOPATH was allowed to calculate new biomass values. The results indicate that a coherent mass-balance model can be developed, based on the experience gained from long histories of personal association with an ecosystem.
 69. Haist, V., Hilborn, R., Saunders, M., 1999. *Sablefish Stock Assessment for 1999 and Recommended Yield Options for 2000 and 2001*. Canadian Stock Assessment Secretariate Research Document 99/195. Stock assessment of sablefish in British Columbian waters for 2000, including data on uncertainty of estimates, historical catch and TAC levels, and suggested TAC options for 2001.
 70. Haist, V., Kronlund, A., Wyeth, M., 2004. *Sablefish (Anoplopoma fimbria) in British Columbia, Canada: Stock Assessment for 2003 and Advice to Managers for 2004*. Canadian Science Advisory Secretariat Research Document 2004/055. Stock assessment of sablefish in British Columbian waters for 2003, including data on uncertainty of estimates, historical catch and TAC levels, and suggested TAC options for 2004.
 71. Haist, V., Kronlund, A., Wyeth, M., 2005. *Sablefish (Anoplopoma fimbria) in British Columbia, Canada: Stock Assessment for 2004 and Advice to Managers for 2005*. Canadian Science Advisory Secretariat Research Document 2005/031. Stock assessment of sablefish in British Columbian waters for 2004, including data on uncertainty of estimates, historical catch and TAC levels, and suggested TAC options for 2005.

72. [Hall-Arber, M. et al. 2004. *New England's Fishing Communities*. MIT Sea Grant College Program.](#) Report including data on fishery dependent communities in New England.
73. [Hanselman, D., Lunsford, C., Sigler, M., Fujioka, J. 2006. *Alaska Sablefish Assessment for 2006*. Alaska Fishery Science Center.](#)
<http://www.afsc.noaa.gov/refm/docs/2005/GOAsable.pdf>. Stock assessment of sablefish in Alaskan waters for 2005, including data on uncertainty of estimates, historical catch and TAC levels, and recommended TAC options for 2006. Sablefish (*Anoplopoma fimbria*) inhabit the northeastern Pacific Ocean from northern Mexico to the Gulf of Alaska, westward to the Aleutian Islands, and into the Bering Sea. Adult sablefish occur along the continental slope, shelf gullies, and in deep fjords, generally at depths greater than 200 m. Sablefish observed from a manned submersible were found on or within 1 m of the bottom. Sablefish form two populations based on differences in growth rate, size at maturity, and tagging studies. A northern population inhabits Alaska and northern British Columbia waters and a southern population inhabits southern British Columbia and Washington, Oregon and California waters, with mixing of the two populations occurring off southwest Vancouver Island and northwest Washington. Relative abundance and length data from the 2005 longline survey, relative abundance and length data from the 2004 longline fishery, and age data from the 2004 longline survey and longline fishery were added to the assessment model. Spawning biomass is projected to remain stable from 2005 to 2006. Sablefish abundance is moderate; projected 2006 spawning biomass is 38% of unfished biomass. We recommend a 2006 ABC of 21,000 mt.
74. [Hare, S., Boldt, J., 2005. *Trends in groundfish biomass and recruits per spawning biomass*. Alaska Fisheries Science Center.](#)
http://access.afsc.noaa.gov/reem/ecoweb/content/TrendsinGroundfishBSr_Hal.xls. Data on halibut biomass by area from 1968-1999, data provided by Steven Hare at IPHC.
75. [Harrington, J., Myers, R., Roseberg, A., 2005. *Wasted Resources: Bycatch and discards in U.S. Fisheries*. Prepared by MRAG Americas for Oceana.](#) The unintentional capture of non-target species of fish, mammals, turtles and birds, and invertebrates is a well-recognized feature of fisheries around the world. Usually termed bycatch, some of the captured organisms may be retained for sale or use, while others are discarded back into the sea due to either low value or regulatory requirements. Survival rates for discarded bycatch is highly variable, as are the impacts of bycatch on marine ecosystems but it is widely accepted that the ecological impacts of bycatch are substantial. Our goal for this report is to provide a comprehensive picture of U.S. discarded bycatch in federally managed commercial fisheries. We hope this report will serve as a reference point for management and monitoring of this important conservation issue in the future. As new, better, or corrected data become available, we believe the picture we present will be sharpened. More importantly, as greater attention is paid to this problem, we hope the level of bycatch and discarding will continue to be reduced. The report provides discarded bycatch estimates for the 27 major fisheries in the United States.
76. [Helser, T., Stewart, I., Fleischer, G., Martell, S., 2006. *Stock Assessment of Pacific Hake \(Whiting\) in U.S. and Canadian Waters in 2006*. Northwest Fisheries Science Center.](#)

http://www.pcouncil.org/groundfish/gfsafe0406/2006_hake_assessment_FINAL_EN TIRE.pdf. Stock assessment of Pacific whiting (hake) in both U.S. and Canadian waters for 2006.

77. Ianelli, J., Barbeau, S., Honkalehto, T., Lauth, B., Williamson, N., 2005. *Assessment of Alaska Pollock Stock in the Eastern Bering Sea*. Alaska Fishery Science Center. <http://www.afsc.noaa.gov/refm/docs/2005/EBSPollock.pdf>. Stock assessment for 2005 of Alaska pollock in the eastern Bering Sea. Walleye pollock (*Theragra chalcogramma*) are broadly distributed throughout the North Pacific with largest concentrations found in the Eastern Bering Sea. Also marketed under the name Alaska pollock, this species represented over 40% of the global whitefish production in 2004 with the market disposition split fairly evenly between fillets, whole (head and gutted), and surimi. An important component of the commercial production is the sale of roe from pre-spawning pollock. Pollock are considered a relatively fast growing and short-lived species and currently represents a major biological component of the Bering Sea ecosystem. In the U.S. portion of the Bering Sea three stocks of pollock are identified for management purposes. These are: Eastern Bering Sea which consists of pollock occurring on the Eastern Bering Sea shelf from Unimak Pass to the U.S.-Russia Convention line; the Aleutian Islands Region encompassing the Aleutian Islands shelf region from 170°W to the U.S.-Russia Convention line; and the Central Bering Sea—Bogoslof Island pollock. The 2005 NMFS summer bottom-trawl (BTS) survey biomass and age composition estimates were added. The biomass estimate from the BTS was 5.134 million tons, up 37% from the 2004 estimate of 3.756 million t. The 2004 echo-integration trawl (EIT) survey numbers-at-age estimates were revised using EIT samples for the age-length key (previously the 2004 BTS age-length key was used). Observer data for age and size composition and average weight-at-age were evaluated for the 2004 fishery and were included in the analyses. Total pollock catch for 2004 was estimated from the NMFS Alaska Region data. The 2005 catch was projected to be 1,478,500 t.
78. Indians 2006. *Tribal directory*. Retrieved September 22, 2006 from <http://www.indians.org/Resource/FedTribes99/fedtribes99.html>. List of federally recognized American Indian tribes throughout the U.S.
79. International Pacific Halibut Commission (IPHC) 2004. *Pacific Halibut Catch Limits: 1980-2004*. Retrieved March 17, 2006, from <http://www.iphc.washington.edu/halcom/commerc/limits80299.htm>. Data on Total Allowable Catch limits for halibut in both Alaska and British Columbia from 1980-2004.
80. International Pacific Halibut Commission (IPHC) 2005a. *Commercial halibut catch and effort for IPHC statistical areas on the B.C. coast (Regulatory Area 2B)*. <http://www.iphc.washington.edu/halcom/commerc/2bcpue2004.pdf>. The report summarizes commercial catch and catch per unit effort (CPUE) of Pacific Halibut by IPHC statistical areas for the years 1980- 2004. It was compiled for distribution by the Department of Fisheries and Oceans, Canada.
81. International Pacific Halibut Commission (IPHC) 2005b. *Pacific halibut fishery regulations 2005*. <http://www.iphc.washington.edu/halcom/pubs/regs/2005iphcregs.pdf>.

- Description of the 2005 IPHC regulations, including information on season, closures, limits, logs, and monitoring.
82. International Pacific Halibut Commission (IPHC), 2006. *Past Halibut Opening Dates*. Retrieved April 20, 2006, from <http://www.iphc.washington.edu/halcom/commerc/opdates.htm>. Season length for Alaska halibut from 1980 through 2005.
 83. Intuitor 2006. *How to Design Small Decision Making Groups*. Retrieved September 27, 2006 from <http://www.intuitor.com/statistics/SmallGroups.html>. Optimal small group size.
 84. Iudicello, Weber and Wieland. 1999. *Fish, Markets, and Fishermen: The Economics of Overfishing*. In-depth look at fishery economics and the impacts of ITQs, covering data on AK halibut and sablefish (quota values, owners), BC halibut (employment, concentration), MA surf clam and ocean quahog (quota values, owners, vessels, safety), and SA wreckfish (effort in days fished, quota values, owners).
 85. Knapp, Hull, 1996. *The First Year of the Alaska IFQ Program: A Survey of Halibut Quota Share Holders*. http://www.iser.uaa.alaska.edu/iser/people/knapp/Knapp_and_Hull_IFQ_96_exec_sum.pdf. The report presents the results of a mail survey of halibut quota share holders conducted in the spring of 1996 by the University of Alaska Anchorage Institute of Social and Economic Research (ISER). The purpose of the study was to gather information on halibut fishing during the first year of the IFQ program. The report represents a start towards understanding some of the effects of the IFQ program on halibut fishing and fishermen. Results include data on average crew size and quota owner habits (e.g. incorporating boat safety and weather considerations to determine when to fish).
 86. Knapp, G., 2006. *Selected Economic Impacts of Crab Rationalization on Kodiak: Preliminary Results*. ComFish Alaska 2006. Report covers first year economic and other impacts of AK crab rationalization, including price increases, season length, rationalization in boats and pots, and crew effort and wages.
 87. Langdon-Pollock, J. 2004. *West Coast Marine Fishing Community Descriptions*. Pacific States Marine Fisheries Commission. January. Report including data on fishery dependent communities in Pacific states.
 88. Leal, D. 2002. *Fencing the Fishery: A Primer on Ending the Race for Fish*. Political Economy Research Center. Report covers summary of ITQ success, cooperatives (AK pollock, Pacific whiting), and TURFs. Anyone familiar with ocean coastal fishing recognizes that the current system of management is broken and needs fixing. Since 1999, seven species of groundfish off Washington, Oregon, and northern California have been declared overfished by the National Marine Fisheries Service. So have several crab stocks off Alaska's Bering Sea, and the federal government is about to embark on a \$100 million vessel buy-out program to reduce the size of the crab fleet. Salmon fishers in the Pacific Northwest are trying to recover from declining harvests over the last, while their counterparts off Alaska must contend with poor product quality and stiff competition from farmed salmon. The good news is that there is a way to help these and other fishers in the Pacific Northwest and Alaska overcome such problems. A number of

ocean fisheries around the world have adopted alternatives to traditional command-and-control fisheries management. These include individual transferable (or fishing) quotas (called ITQs or IFQs), private harvesting agreements, and exclusive fishing rights in marine areas (with property rights in the fish stocks themselves remaining a possibility). All of these fall under the heading of rights-based fishing. By using them, many fisheries have experienced significant benefits. This booklet explains the reasoning behind rights-based fishing and explores various institutional arrangements along the property rights spectrum. Moving to such arrangements faces obstacles, however, and this booklet offers options for overcoming some of them. It will address problems that remain when ITQs are adopted, such as bycatch and multispecies fisheries and high grading, as well as the tough issue of the initial allocation of individual transferable quotas. It also addresses the problem of applying ITQs to anadromous fish such as salmon in the Pacific Northwest.

89. Mahmoudi, B. 2005. *The 2005 update of the stock assessment for stripped mullet, *Mugil cephalus*, in Florida*. Florida Fish and Wildlife Conservation Commission. December. Stock assessment for Florida mullet, includes information on vessels.
90. Mantzaris, C., NOAA, 2006. Personal correspondence on July 13, 2006. Personal correspondence on number of vessels in fisheries.
91. Marcoul, P., Weninger, Q., 2004. *Search and learning with correlated information: theory and evidence from professional fishermen*. <http://www.econ.iastate.edu/faculty/weninger/fishsearch10.pdf>. Report includes number of crew per boat in the MA surf clam and ocean quahog fishery. The search for fish is modeled as a dynamic multi-armed bandit problem; bandit arms represent distinct fishing sites which pay out random but correlated catch success. With correlation, the catch rate at a site also informs the fisherman about harvesting prospects at other sites. We show that the optimal search order and investment in information is affected by the sign and magnitude of correlation. Information value is largest, and consequently agents are more willing to search potentially suboptimal sites to learn, when catch is negatively correlated. Results are reversed with positive correlation. Search behavior of professional fishermen is examined and found to be consistent with the model under positively correlated catch success. Search is more likely when the cost of gathering information is low or the perceived benefit high, and correlation in perceived catch is crucial for predicting spatial search patterns. The results are important since correlated information is a common feature in problems of search under uncertainty.
92. Marine Conservation Biology Institute, 2003. *B2B 1.1 CD-ROM: Information for Conservation Planning--Baja California to the Bering Sea*. <http://www.mcbi.org/marineprotected/Marine.htm#Past>. Geographic Information System data on Exclusive Economic Zones for Alaska, BC, western U.S. and western Mexico.
93. Marine Stewardship Council. *Certified Fisheries*. Retrieved May 12, 2006, from http://www.msc.org/html/content_484.htm. List of fisheries that are currently MSC-certified, or those in the process of certification.

94. Maryland Commercial Fisheries, 2006. *Maryland Commercial Fisheries License Types and Fees*. Retrieved September 10, 2006 from <http://www.dnr.state.md.us/fisheries/commercial/commllicenses.html>. Commercial licenses for MD fisheries.
95. Maryland Department of Natural Resources (MDNR), 2006. *Monkfish*. Retrieved September 6, 2006 from <http://www.dnr.state.md.us/fisheries/education/monkfish/monkfish.html>. Report includes information on recreational catch
96. Matulich and Clark. 2003. *North Pacific Halibut and Sablefish IFQ Policy Design: Quantifying the Impacts on Processors*. Marine Resource Economics, Volume 18, pp. 149–166. This study examines how the two largest individual transferable fishing quota (IFQ) policies in the United States impacted halibut and sablefish processors. A survey of processors was conducted to estimate the change in processing sector welfare, measured as the change in quasi rents before and after IFQs. The policy was efficient and harvesters were left much better off. However, most processors did not participate in the rationalization benefits and, on average, were left worse off. Expanding the survey results to the pre-IFQ population, it is estimated that the halibut processing sector lost 56% of its prior quasi rents, while sablefish processors lost 76%. Eighty-two percent of the pre- IFQ halibut processors and 96% of the sablefish processors were estimated to be absolutely worse off.
97. McElderry, H., Schrader, J., Illingworth, J. 2003. *The Efficacy of Video-Based Electronic Monitoring for the Halibut Longline Fishery*. Canadian Science Advisory Secretariat Research Document 2003/042. http://www.dfo-mpo.gc.ca/csas/Csas/publications/ResDocs-DocRech/2003/2003_042_e.htm. This project involved the large-scale deployment of electronic monitoring (EM) systems on the 2002 British Columbia halibut longline fishery to evaluate the feasibility of EM as an alternative to observer-based at-sea monitoring. EM systems were deployed on 59 regular halibut fishing trips involving 19 fishing vessels, providing about 700 usable sets, 1,000 hours of imagery, and 350,000 observed hooks. Catch items identified by EM represented over 60 fish, invertebrate or seabird species or species groupings, and the 15 fish most abundant species accounted for 98% of the catch. Data from fishing trips where EM and observers were deployed (about 55% of the trips) were compared by total overall catch, total catch by set, and catch by individual hook. Overall EM and observer catch estimates agreed within 2%, and individual identifications by hook agreed in over 90% of the catch records. EM reliably (i.e., accuracy within 10%) distinguished thirteen species that represented 97% of the halibut fishery catch. Some species, particularly non-distinct forms, were not identified well by EM. Sample sizes were too small among half of the species for determination of an EM species identification capability. Close agreement between EM and observer was also evident with species utilization determination (i.e. kept or discarded) and time, location and depth at set start and finish. The results of this study demonstrate that EM is a promising tool for at-sea monitoring applications. The paper also covers cost of observers (\$450 CDN/day) and EM (\$210 CDN/day).
98. McElderry, H., J. Illingworth, D. McCullough, and J. Schrader. 2004. *Electronic Monitoring of the Cape Cod Haddock Fishery in the United States – A Pilot Study*. Unpublished report

prepared for the Cape Cod Commercial Hook Fishermen's Association (CCCHFA) by Archipelago Marine Research Ltd., Victoria BC Canada. Archipelago Marine Research Ltd. was contracted by the Cape Cod Commercial Hook Fishermen's Association (CCCHFA) to evaluate electronic monitoring (EM) as a tool to monitor catch in a longline fishery for haddock where bycatch rates of Atlantic cod must be closely monitored. This pilot study involved field-testing EM systems on four fishing vessels for fishing operations over a three-week trial period. EM systems consisted of two closed circuit television cameras, a GPS receiver, a hydraulic pressure sensor, and a data storage device. The EM systems were in place for 24 fishing trips and 136 fishing events. At-sea observers were deployed on nearly all trips in order to evaluate the quality of EM catch data. Fishing event imagery was examined for species identification, enumeration of catch and verification of fishing times. EM sensor data provided fine temporal and spatial information about the fishing events. EM catch monitoring (enumeration and species identification) was compared with observer data in three ways: overall totals by species, species totals by fishing set and comparison of individual catch items (by hook). On the basis of aggregate totals, EM and observers distinguished similar numbers of fish species; total piece counts between EM and the observer were within 2%, and 5% for key catch species. The catch comparison by set compared the six most abundant fish species (96% of the catch) and all showed strong correlations (r^2) between EM and observer estimates. The method of comparing EM and observer identifications by hook was problematic, although there was over 85% agreement between EM and observer identifications for all but one species. We estimate that catch estimates between observer and EM for haddock and Atlantic cod were within 5%. In this monitoring application, EM offers a number of advantages over observer programs including lower cost, labour savings, logistical efficiency, fleet suitability, and increased industry acceptance. Issues hindering the implementation of an EM-based monitoring program include expanding fleet awareness of EM program requirements, local infrastructure to support such a program, and solidifying data sharing agreements that specify what information would be collected and how it would be used. EM programs generally run between 20-60% of the cost of an at-sea observer program

99. Mid-Atlantic Fishery Management Council (MAFMC), 2006. *Fishery Management Plan Summaries for 1) Summer Flounder, Scup, and Black Sea Bass, 2) Dogfish, 3) Surfclam and Ocean Quabog, 4) Atlantic Mackerel, Squid, and Butterfish, 5) Bluefish, 6) Tilefish, and 7) Monkfish*. Retrieved March 13, 2006, from <http://www.mafmc.org/mid-atlantic/fmp/fmp.htm>. Current and historical fishery management regulations for specified fisheries.
100. Mittal, A. 2004. *Individual Fishing Quotas: Economic Effects on Processors and Methods Available to Protect Communities*. U.S. General Accounting Office 04-487. Testimony Before the Committee on Commerce, Science, and Transportation, U.S. Senate. IFQ programs have achieved many of the desired conservation and management benefits, such as helping to stabilize fisheries, reducing excessive investment in fishing capacity, and improving safety. However, concerns have been raised about the economic effects of IFQ programs on fish processors and fishing communities, among others. The Alaskan halibut IFQ program has had varied economic effects on processors. The program extended the halibut fishing season to 8 months, allowing more halibut to be processed and sold as a fresh product. This shift to fresh product led to the emergence of the

buyer broker, an increased competition for fish, and higher halibut ex-vessel prices (prices paid to fishermen for raw product). In addition, a net decrease of 12 shore-based plants that processed halibut occurred between 1995, when the IFQ program was implemented, and 2001, as well as a reallocation of market share. For the 28 companies that processed halibut in both 1995 and 2001, 15 lost market share and 13 gained market share. Several methods are available for protecting the economic viability of fishing communities under an IFQ program. The easiest and most direct way is to allow communities to hold harvesting quota and decide how this quota is to be used. In addition, fishery managers can help ensure the economic viability of communities by adopting quota management rules aimed at protecting certain groups of fishery participants. However, protecting the economic viability of communities is a social objective, and realizing such an objective may undermine economic efficiency and raise questions of equity.

101. Moore, B.. 2005. *Maine Lobster*. The Working Waterfront web edition. Island Institute. November 2005. <http://www.workingwaterfront.com/article.asp?storyID=20051102> Information on markets and product form of Maine lobster.
102. National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce. 1996. *Our Living Oceans: The Economic Status of U.S. Fisheries*. <http://spo.nwr.noaa.gov/olo99.htm> Our Living Oceans 1999 is the fifth edition in a series of recent reviews on the biological status of U.S. living marine resources. Previous reports were released covering the 3-year periods ending in 1991, 1992, 1993, and 1995. These reviews have evolved to a triennial reporting effort to better capture the extended time period that is often required to observe and document changes in the marine environment. The biological status of living marine resources is presented for five large regions of the United States: Northeast, Southeast (including the Gulf of Mexico and Caribbean), Alaska, Pacific Coast, and the Western Pacific.
103. National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce. 2004. *United States National Plan of Action for the Management of Fishing Capacity*. August 2004. The management of fishing capacity is a high priority for U.S. fisheries. The National Marine Fisheries Service (NOAA Fisheries) is working to bring about effective and lasting resolution to this challenge. The United States played a significant role during the 1990s in addressing the problem of overcapacity in marine fisheries, and was a key participant in the Food and Agriculture Organization's (FAO) technical and policy-level consultations of 1997-1999 that led to the International Plan of Action for the Management of Fishing Capacity (IPOA/capacity). NOAA Fisheries believes that the United States should eliminate or significantly reduce overcapacity in 25 percent of federally managed fisheries by the end of 2009 and in a substantial majority of fisheries in the following decade. These long-term targets will depend on progress made in reducing and eliminating overfishing in federally managed fisheries, a closely related mandate in the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). Given the structure of the U.S. fisheries management system, specific remedial measures are being developed by the eight Regional Fishery Management Councils (Councils) on a fishery-by-fishery basis. NOAA Fisheries will work

cooperatively with the Councils to identify fisheries in need of capacity reduction and to develop measures to achieve those reductions. Programs to manage capacity will typically include (1) limited entry and permit management programs, (2) exclusive quota programs, and (3) publicly and privately funded buybacks of permits and/or vessels. The United States pledges to play an active role in achieving progress on this important issue.

104. National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce. 2003. *Final Amendment 1 to the FMP for Atlantic Tunas, Swordfish, and Sharks*. Highly Migratory Species Division. November. <http://www.nmfs.noaa.gov/sfa/hms/hmsdocuments.html>. FMP for HMS.
105. National Marine Fisheries Service, 2005. *Report of Status of U.S. Fisheries. Status Determination Tables A-D*. <http://www.nmfs.noaa.gov/sfa/statusoffisheries/SOSmain.htm>. Report by NMFS on the status of fish stocks in the U.S., including Fish Stock Sustainability Index performance measures of 230 stocks, plus overfishing/overfished data on many non-FSSI stocks.
106. National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce. 2006a. *Annual Commercial Landing Statistics*. Retrieved May 18, 2006, from http://www.st.nmfs.gov/st1/commercial/landings/annual_landings.html. Landings and value for all U.S. commercial species by state and by year.
107. National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce. 2006b. *Fishery Management Councils*. Retrieved March 13, 2006, from <http://www.nmfs.noaa.gov/councils>. Brief history of councils and list of U.S. Fishery Management Councils with links to individual web sites.
108. National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce. 2006c. *Flow chart illustrating the creation of annual CDQ reserves*. Retrieved April 2, 2006, from <http://www.fakr.noaa.gov/cdq/cdqreserves.pdf>. Percentages of TAC for Community Development Quota allocations in the Alaska groundfish fisheries (pollock, sablefish, and all other groundfish).
109. National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce. 2006d. *IFQ/CDQ Halibut and Sablefish Allocations*. Retrieved April 2, 2006, from <http://www.fakr.noaa.gov/ram/06ifqtac.pdf>. Community Development Quota allocations by area in the Alaska halibut and sablefish fisheries.
110. National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce. 2006e. *Crab CDQ Allocations and Catch 1998-2005*. Retrieved April 2, 2006 from http://www.fakr.noaa.gov/cdq/crabcdq98_05.xls. Community Development Quota allocations and harvest by area from 1998-2005 in the Alaska crab fishery.
111. National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce. 2006f. *Changes in Halibut QS Holdings between Initial Issuance and Currently Issued*. Retrieved April 2, 2006 from

- <http://www.fakr.noaa.gov/ram/daily/ifqqscompare.htm>. Data on changes in ownership (number of persons, Alaskan vs. non-Alaskan) in AK halibut fishery from 1995-2006.
112. National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce. 2006g. *Monthly Commercial Landing Statistics*. Retrieved May 18, 2006, from http://www.st.nmfs.gov/st1/commercial/landings/monthly_landings.html. Landings and value for all U.S. commercial species by state, year, and month.
 113. National Oceanic and Atmospheric Administration, 2006a. *Essential Fish Habitat (EFH) GIS data*. AK regional office. Retrieved February 9, 2006, from <http://akr-mapping.fakr.noaa.gov/Website/EFH/viewer.htm?enhanced>. Geographic Information System data on fish habitat in Alaska.
 114. National Oceanic and Atmospheric Administration, 2006b. *Exclusive Economic Zone Geographic Information System (GIS) data*. Retrieved February 10, 2006, from <http://nauticalcharts.noaa.gov/csdl/eez.htm>. Geographic Information System data on Exclusive Economic Zones.
 115. National Oceanic and Atmospheric Administration, 2006c. *Marine Recreational Fisheries Statistics Survey*. Retrieved September 8, 2006 from <http://www.st.nmfs.gov/st1/recreational/downloads.html>. The Marine Recreational Fisheries Statistics Program team provides essential marine recreational fisheries information to government, scientists, and the public. The team of fisheries biologists, statisticians, and data managers provides accurate, precise, and timely fisheries-dependent information for US marine waters by conducting and evaluating the Marine Recreational Fisheries Statistics Survey (MRFSS) to produce catch, effort and participation estimates, and to provide biological, social and economic data, ensuring quality control and quality assurance of the MRFSS, researching new survey designs, providing statistical advice and promoting quality recreational fisheries information within NMFS and to other natural resource management agencies and organizations, participating in NMFS planning efforts to improve internal fisheries-dependent data collection and management, participating in coastal State/Federal efforts to plan and implement coordinated and cooperative recreational fisheries data collection and management programs, communicating survey and research results, and educating the public about the survey and new research.
 116. National Research Council. 1999a. *Sharing the Fish: Toward a National Policy on the Use of Individual Quotas in Fisheries*. Washington, D.C.: National Academy Press. <http://www.nap.edu/books/0309063302/html>. In depth report on the performance of four U.S. ITQs based on requests from Congress, resulting in recommendations to lift the then moratorium on ITQs. Individual fishing quotas have been used worldwide since the late 1970s. A few countries, particularly Canada, New Zealand, and Iceland, have significant experience in the benefits and problems of developing, implementing, and managing IFQs. This tool has been adopted in four U.S. fisheries (Alaskan halibut and sablefish, wreckfish, and surf clams/ocean quahogs), and programs were about to be implemented in two other fisheries when Congress intervened through enactment of the Sustainable Fisheries Act of 1996, establishing a moratorium on new programs.

Congress asked the National Academy of Sciences to study a wide range of questions concerning the social, economic, and biologic effects of IFQs and other limited entry systems and to make recommendations about existing and future IFQ programs. A committee with expertise in fisheries biology and management, anthropology, economics, law, political science, and business was established to study all aspects of IFQs in response to the request from Congress. Over a seven-month period, the committee held hearings in Anchorage, Seattle, New Orleans, Washington, D.C., and Boston. It heard testimony from fishermen, processors, state and federal regulators, academicians, environmental groups, and members of the public, and received a large amount of written material. This report is the result of the committee's deliberations. For example, the Alaskan IFQ programs for halibut and sablefish addressed and reduced overcapacity and safety problems associated with derby fisheries. Evidence from the Alaskan IFQ programs suggests that the derby has been eliminated, safety has improved, and ghost fishing has been reduced. At the same time, these IFQ programs have left the halibut and sablefish fisheries with fewer fishermen (as intended) and have enriched many of those whose catch history qualified them for quota shares.

117. National Research Council. 1999b. *The Community Development Quota Program in Alaska*. National Academy Press, Washington, DC. <http://www.nap.edu/catalog/6114.html>. This book reviews the performance and effectiveness of the Community Development Quotas (CDQ) programs that were formed as a result of the Sustainable Fisheries Act of 1996. The CDQ program is a method of allocating access to fisheries to eligible communities with the intent of promoting local social and economic conditions through participation in fishing-related activities. The book looks at those Alaskan fisheries that have experience with CDQs, such as halibut, pollock, sablefish, and crab, and comments on the extent to which the programs have met their objectives--helping communities develop ongoing commercial fishing and processing activities, creating employment opportunities, and providing capital for investment in fishing, processing, and support projects such as infrastructure. It also considers how CDQ-type programs might apply in the Western Pacific.
118. New England Fishery Management Council (NEFMC), 2004. *Herring PDT/TC Report*. May. Fishery regulations and vessel information for Herring.
119. New England Fishery Management Council (NEFMC), 2006a. *Fishery Management Plans for 1) Northeast Multispecies, 2) Scallops, 3) Monkfish, 4) Herring, 5) Small Mesh Multispecies, 6) Dogfish, 7) Red Crab, 8) Skates, and 9) Atlantic Salmon*. Retrieved March 14, 2006, from <http://www.fakr.noaa.gov/npfmc/fmp/fmp.htm>. Current and historical fishery management regulations for specified fisheries.
120. New England Fishery Management Council (NEFMC), 2006b. *Monkfish Fishery Management Plan Annual Specifications for the 2006 Fishing Year*. February. FMP for monkfish.
121. New Jersey Division of Fish, Game, and Wildlife, 1998. *1998 Annual Report*. Report includes information on recreational catch.
122. NOAA Fisheries Service 1995-2005, *Total IFQ Landing--Pounds and Percentages by Port*. Retrieved May 5, 2006, from <http://www.fakr.noaa.gov/ram/ifqreports.htm>>IFQ

Harvest by Port e.g. <http://www.fakr.noaa.gov/ram/05ifqport.htm>. Data on landings of halibut and sablefish in Alaska by port from 1995 through 2005, used to determine geographic shifts and potential impacts on processors after ITQs.

123. North Carolina Department of Environment and Natural Resources (NCDENR), 2006. *North Carolina Fishery Management Plan: Striped Mullet*. North Carolina Marine Fisheries. April. The goal of the 2005 North Carolina Striped Mullet Fishery Management Plan (FMP) is to ensure the long-term self-sustainability and sustainable harvest of the North Carolina striped mullet stock. Plan objectives include: develop an objective management program that provides conservation of the resource and sustainable harvest in the fishery; ensure that the spawning stock is of sufficient capacity to prevent recruitment-overfishing; address socio-economic concerns of all user groups; restore, improve, and protect critical habitats that affect growth, survival, and reproduction of the North Carolina striped mullet stock; evaluate, enhance, and initiate studies to increase our understanding of striped mullet biology and population dynamics in North Carolina; and promote public awareness regarding the status and management of the North Carolina striped mullet stock.
124. North Pacific Fishery Management Council (NPFMC), 2002. *Seventeenth coast guard district 2002 Year in Review*. <http://www.fakr.noaa.gov/npfmc/USCG/USCG2002review.pdf>. Report on fishing safety statistics in Alaska.
125. North Pacific Fishery Management Council (NPFMC), 2006. *Fishery Management Plans for 1) Bering Sea/Aleutian Islands Groundfish, 2) Groundfish of the Gulf of Alaska, 3) Bering Sea/Aleutian Islands King and Tanner Crab, 4) Alaska Scallop*, Retrieved March 14, 2006, from <http://www.fakr.noaa.gov/npfmc/fmp/fmp.htm>. Current and historical fishery management regulations for specified fisheries.
126. North Pacific Fishery Management Council (NPFMC), 2005a. *Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area*. January 2005. <http://www.fakr.noaa.gov/npfmc/fmp/bsai/BSAI.pdf>. Groundfish FMP for BSAI, including data on TAC, monitoring, controls, and prohibited species. This Fishery Management Plan (FMP) governs groundfish fisheries of the Bering Sea and Aleutian Islands Management Area (BSAI). The FMP management area is the United States (U.S.) Exclusive Economic Zone (EEZ) of the Bering Sea and that portion of the North Pacific Ocean adjacent to the Aleutian Islands which is between 170° W. longitude and the U.S.-Russian Convention Line of 1867. The FMP covers fisheries for all stocks of finfish and marine invertebrates except salmonids, shrimps, scallops, snails, king crab, Tanner crab, Dungeness crab, corals, surf clams, horsehair crab, lyre crab, Pacific halibut, and Pacific herring. The FMP was implemented on January 1, 1982. As of April 2004, it has been amended over seventy times, and its focus has changed from the regulation of mainly foreign fisheries to the management of fully domestic groundfish fisheries. This version of the FMP has been revised to remove or update obsolete references, as well as outdated catch data and other scientific information. The FMP has also been reorganized to provide readers with a clear understanding of the BSAI groundfish fishery and conservation and management measures promulgated by the FMP.
127. North Pacific Fishery Management Council (NPFMC), 2005b. *Fishery Management Plan for Groundfish of the Gulf of Alaska*. January 2005. <http://www.fakr.noaa.gov/npfmc/fmp/goa/GOA.pdf>. Groundfish FMP for GOA,

including data on TAC, monitoring, controls, and prohibited species. This Fishery Management Plan (FMP) governs groundfish fisheries of the Gulf of Alaska (GOA). The FMP management area is the United States (U.S.) exclusive economic zone (EEZ) of the North Pacific Ocean, exclusive of the Bering Sea, between the eastern Aleutian Islands at 170° W. longitude and Dixon Entrance at 132°40' W. longitude. The FMP covers fisheries for all stocks of finfish except salmon, steelhead, Pacific halibut, Pacific herring, and tuna. This FMP was implemented on December 1, 1978. Since that time, it has been amended over sixty times, and its focus has changed from the regulation of mainly foreign fisheries to the management of fully domestic groundfish fisheries. This new version of the FMP has been revised to remove or update obsolete references to foreign fishery management measures, as well as outdated catch data and other scientific information. The FMP has also been reorganized to provide readers with a clear understanding of the GOA groundfish fishery and conservation and management measures promulgated by the FMP.

128. North Pacific Fishery Management Council (NPFMC), 2006. *Fishery Management Plans for 1) Bering Sea/ Aleutian Islands Groundfish, 2) Groundfish of the Gulf of Alaska, 3) Bering Sea/ Aleutian Islands King and Tanner Crab, 4) Alaska Scallop*, Retrieved March 14, 2006, from <http://www.fakr.noaa.gov/npfmc/fmp/fmp.htm>. Current and historical fishery management regulations for specified fisheries.
129. Northeast Fisheries Science Center (NEFSC), 2003. *37th Northeast Regional Stock Assessment Workshop Stock Assessment Review Committee Consensus Summary of Assessments*, <http://www.nefsc.noaa.gov/nefsc/publications/crd/crd0316/surfclam.pdf>. Stock assessment of surf clam for 2003.
130. Oregon Fish and Wildlife Commission (ORFWC), 2006. *Dungeness Crab Pot Limit Briefing: Summary*. Retrieved September 10, 2006 from http://www.dfw.state.or.us/agency/commission/minutes/06/mar/D_1_summary.pdf. March 16-17, 2006. This briefing presents staff progress on development of pot limit implementation strategies and a brief discussion of process/next steps. The West Coast Dungeness crab fishery is managed biologically through “size, sex and season”. Coast-wide regulations are collectively coordinated as a Tri-state fishery by Oregon, California, and Washington under delegation by the federal government (Magnuson-Stevens Fishery Conservation and Management Act). The three states have jurisdiction over their respective permit holders and permit conditions (such as gear, seasons, etc.) as well as control over conditions for making landings within a state. Regulatory issues that affect more than one state’s fishery are considered in a “Tri-State Management” process, which is coordinated by the Pacific States Marine Fisheries Commission (PSMFC).
131. Pacific Fishery Management Council (PFMC), 2005. *Status of the U.S. West Coast Fisheries for Highly Migratory Species Through 2004*. October. Includes information on regulations and vessels for HMS.
132. Pacific Fishery Management Council (PFMC), 2006a. *Fishery Management Plans for 1) Groundfish, 2) Highly Migratory Species, 3) Coastal Pelagic Species, and 4) Salmon*. Retrieved March 14, 2006, from <http://www.pcouncil.org>. Current and historical fishery management plans for specified fisheries.

133. Pacific Fishery Management Council (PFMC), 2006b. *Groundfish Individual Fishing Quotas*. Retrieved June 15, 2006, from www.pfcouncil.org/groundfish/gfifq.html. Background, current status, options, and possible terms for a Pacific groundfish ITQ.
134. Pacific Fishery Management Council (PFMC), 2006c. *Vessel Monitoring Systems (VMS)*. Retrieved June 20, 2006, from <http://www.pfcouncil.org/groundfish/gfvms.html>. VMS information for the Pacific groundfish fishery, including cost estimate.
135. Pacific Fishery Management Council (PFMC), 2006d. *Status of the Pacific Coast Coastal Pelagic Species Fishery and Recommended Acceptable Biological Catches*. June. Includes information on regulations, vessels, TAC, and biologic information on pelagics.
136. Pacific Seafoods International, 2006. Retrieved August 17, 2006. <http://www.pacificseafoods.com>. Information on processing and form of salmon.
137. Pacific States Marine Fisheries Commission (PSMFC) 2006. *Recreational Fisheries Information Network*. Retrieved September 8, 2006 from <http://www.psmfc.org/recfin>. Includes data on recreational catch.
138. Pacific Whiting Conservation Cooperative (PWCC). 2005. *PWCC News Volume 8 Issue 2, November 2005*. http://pacificwhiting.org/images/Nov_2005_PWCC_news.pdf. Newsletter for 2005 detailing the Pacific whiting cooperative fleet size, bycatch performance, and season length.
139. Pacific Whiting Conservation Cooperative (PWCC). 2006. *PWCC Catch Management Program*. Retrieved May 2, 2006, from <http://pacificwhiting.org/catchManagement.htm>. Historical data on the Pacific whiting cooperative bycatch for many species.
140. Package, C. and Sepez, J., 2004. *Fishing Communities of the North Pacific: Social Science Research at the Alaska Fisheries Science Center*. AFSC Quarterly Report. June. Report including data on fishery dependent communities in Pacific states.
141. Pautzke, C., Oliver, C., 1997. *Development of the Individual Fishing Quota Program for Sablefish and Halibut Longline Fisheries off Alaska*. Presented September 4, 1997 to the National Research Council's Committee to Review Individual Fishing Quotas. http://www.fakr.noaa.gov/npfmc/sci_papers/ifqpaper.htm. The individual fishing quota (IFQ) program for the sablefish and halibut longline fisheries off Alaska was implemented in 1995. It culminated fourteen years of deliberations of the North Pacific Fishery Management Council (Council) on limited entry. The long gestation clearly attests to the program's gravity and controversy. Development of the program occurred during a period of great change in fisheries off Alaska, the 1980's. Foreign fisheries were replaced by domestic operations, which expanded more rapidly than ever anticipated. Suddenly the Council was faced with overcapitalization, not only in sablefish and halibut, but all major fisheries under its jurisdiction. The paper reviews the policy setting and development of the limited entry programs, emphasizing IFQ systems. The paper briefly describes components of the sablefish and halibut programs and the Council's intent, and then discuss the specific issues tasked for consideration of the National Research Council's Committee to Review Individual Fishing Quotas.
142. Pitcher, T., Chuenpagdee, R. 1994. *Bycatch in Fisheries and their Impact on the Ecosystem*. Volume 2 Number 1. Fisheries Centre, University of British Columbia. Report on

- bycatch in the BC groundfish fishery, including data on 1994 discard ratios pre-DAP and ecosystem impacts.
143. Pollock Conservation Cooperative (PCC). 2004. *Final Joint Annual Report 2004 to the North Pacific Fishery Management Council*. <http://www.atsea.org/PCCHSCCAnnRpt2-1-05.pdf>. Annual report for 2004 on the Pollock Conservation Cooperative, including data on members and concentration.
 144. Pollock Conservation Cooperative (PCC). 2003. *Final Joint Annual Report 2003 to the North Pacific Fishery Management Council*. <http://www.atsea.org/PCC-HSCC%202003%20FINAL.pdf>. Annual report for 2003 on the Pollock Conservation Cooperative, including data on members and concentration.
 145. Pollock Conservation Cooperative (PCC). 2002. *Final Joint Annual Report 2002 to the North Pacific Fishery Management Council*. <http://www.atsea.org/concerns/PCC-HSCC%202002%20FINAL.pdf>. Annual report for 2002 on the Pollock Conservation Cooperative, including data on members and concentration.
 146. Pollock Conservation Cooperative (PCC). 2001. *Final Joint Annual Report 2001 to the North Pacific Fishery Management Council*. http://www.atsea.org/concerns/2001_final_draft_v6.pdf. Annual report for 2001 on the Pollock Conservation Cooperative, including data on members and concentration.
 147. Pollock Conservation Cooperative (PCC). 2000. *Final Joint Annual Report 2000 to the North Pacific Fishery Management Council*. http://www.atsea.org/concerns/PCC-HSCC_2000_FINAL_Report.pdf. Annual report for 2000 on the Pollock Conservation Cooperative, including data on members and concentration.
 148. Pollock Conservation Cooperative (PCC). 1999. *Final Joint Annual Report 1999 to the North Pacific Fishery Management Council*. http://www.atsea.org/concerns/PCC_Report_to_NPFMC.pdf. Annual report for 1999 on the Pollock Conservation Cooperative, including data on members and concentration.
 149. Puget Sound Action Team (PSAT), 2003. *Treasure of the Tidelands*. July. http://www.psaw.gov/Programs/shellfish/fact_sheets/economy_web1.pdf. Information on shellfish for Puget Sound, including recreational information.
 150. Queirolo, L., Fritz, L., Livingston, P., Loefflad, M., Colpo, D., deReynier, Y. 1995. *Bycatch, Utilization, and Discards in the Commercial Groundfish Fisheries of the Gulf of Alaska, Eastern Bering Sea, and Aleutian Islands*. U.S. DOC, NOAA Technical Memorandum NMFS-AFSC-58. This report documents reported catch, bycatch, utilization, and discard data and attempts to identify patterns and trends in the commercial groundfish fisheries of the Gulf of Alaska (GOA), eastern Bering Sea, and Aleutian Islands (BSAI) (areas which currently make up the United States' Exclusive Economic Zone off Alaska). The report identifies existing data sources and examines the historical catch record, as well as the current domestic groundfish fisheries in these areas for the period between 1990 and 1995.
 151. Redstone Strategy Group and Environmental Defense, 2006a. *Assessing Dedicated Access Privilege Programs (DAPs) in the United States and British Columbia*. Working paper,

September. The paper focused on DAP performance, showing that a transition from command-and-control management systems to incentive-based DAPs resulted in major economic improvements as well as gains in environmental and social conditions. Environmentally, improved fishing behavior decreased total allowable catch (TAC) overages, discards, and habitat destruction across the board. These improved fishing practices also allowed better management of biomass, ecosystem health, and commercial landings. Socially, there were both positive and negative effects. Although some stakeholders benefited from DAPs, there were also community, processor, and job losses; private economic gains at public expense; and modestly increased ownership concentration and consolidation. However, newer DAPs were able to address many of these concerns through careful design. Consequently, future DAP implementations should incorporate lessons from past experiences under similar economic, environmental, and social conditions.

152. [Redstone Strategy Group and Environmental Defense, 2006b. Implementing Dedicated Access Privilege Programs \(DAPs\): Lessons and recommendations from other public resources and U.S. and B.C. DAPs. Working paper, October.](#) The paper focused on implementation lessons from both past DAPs and management and allocation of other public resources over the past two centuries. A survey of nine non-fishery public resources (including mining, water rights, SO₂, and spectrum) showed that the government commonly used a limited set of approaches on allocation method, tenure, and rules to balance industry development objectives with social and environmental goals. Rules and monitoring were particularly important to protect public interest goals such as environmental quality. A parallel survey of 10 U.S. and B.C. DAPs showed that DAP implementations in fisheries commonly used an even narrower subset of the approaches seen in non-fishery public resources. This limited menu often resulted from efforts to ensure sustainability while honoring the long history of local interest in the resources. Despite the limited subset of approaches commonly used in DAPs, careful choices can result in excellent economic, social, and environmental results.
153. [Roberts, S. 2005. Wild-caught Cold Water Shrimp. Seafood Watch Seafood Report. Monterey Bay Aquarium. December 2005.](#)
http://www.mbayaq.org/cr/cr_seafoodwatch/content/media/MBA_SeafoodWatch_ColdwaterShrimpReport.pdf. Monterey Bay Aquarium's Seafood Watch program evaluates the ecological sustainability of wild-caught and farmed seafood commonly found in the United States marketplace. Shrimp is the biggest-selling seafood on the U.S. market. Warmwater shrimp (the genus *Penaeus*) comprise the vast majority of this market, while coldwater (pandalid) shrimp make up only a few percent by weight in both imports and domestic landings. Virtually all coldwater shrimp is imported from Canada or caught domestically.
154. [Rosenstiel School of Marine and Atmospheric Science. Retrieved August 17, 2006 from www.rsmas.miami.edu.](#) Information on market and form of mullet.
155. [Sablefish Fishery Quotas and Catches, 1979-1999. Retrieved March 13, 2006, from http://www.pac.dfo-mpo.gc.ca/sci/sa-mfpd/sablefish/Sable_QuotaCatch.htm.](#) Catch and quota values for the BC sablefish fishery from 1979-1999.

156. Schnute, J., Olsen, N., Haigh, R., 1999. *Slope Rockfish Assessment for the West Coast of Canada in 1999*. Canadian Stock Assessment Secretariat Research Document 99/184 http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/1999/pdf/99_184e.pdf. Stock assessment of slope rockfish in Canadian waters for 1999, including estimates of uncertainty.
157. Schnute, J., Haigh, R., Krishka, B., Starr, P., 2001. *Pacific Ocean Perch Assessment for the West Coast of Canada in 2001*. Canadian Science Advisory Secretariat Research Document 2005/031. http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2001/RES2001_138e.pdf. Stock assessment of Pacific Ocean Perch in Canadian waters for 2001, including estimates of uncertainty.
158. Shotton, R. (ed.), 2000a. *Use of Property Rights in Fisheries Management*. FAO Fisheries Technical Paper No. 404-1. <http://www.fao.org/docrep/003/X7579E/x7579e00.htm>. Part 1 of the proceedings from FishRights 1999 Conference held in Fremantle, Western Australia. Includes mini-course lectures and core conference presentations on the use of property rights in fisheries.
159. Shotton, R. (ed.), 2000b. *Use of Property Rights in Fisheries Management*. FAO Fisheries Technical Paper No. 404-2. <http://www.fao.org/docrep/003/X8985E/X8985E00.HTM>. Part 2 of the proceedings from FishRights 1999 Conference held in Fremantle, Western Australia. Includes workshop presentations on the use of property rights in fisheries.
160. Shotton, R. (ed.), 2001a. *Case studies on the effects of transferable fishing rights on fleet capacity and concentration of quota ownership*. FAO Fisheries Technical Paper 412. <ftp://ftp.fao.org/docrep/fao/005/y2498e/y2498e00.pdf> This report, consisting of 16 national, or national fishery, studies, describes how the introduction of transferable fishing (effort) or fish (catch) quotas has affected the capacity of the fleet prosecuting the target fishery for which the harvesting rights apply. The case studies include two from the European Union (the U.K. and the Netherlands) and for Iceland. Two studies are presented for fisheries along the eastern seaboard of the United States Seven accounts are included from Australia, two of which describe fisheries managed by the Commonwealth Government through the Australian Offshore Constitutional Settlement (the Northern Prawn Fishery and the fishery for southern bluefin tuna). The other five accounts of Australian experiences describe the (unique?) Pilbara Trap Fishery in the northern region of Western Australia, Western Australia's rock lobster fishery and the fishery for the same species and that for abalone and pilchards in South Australia. In Tasmania an account is given for the rock lobster fishery while for New South Wales, a description is given for another invertebrate fishery, that for abalone. An omnibus account is given for the situation in New Zealand. In the Western Pacific, accounts are given for the Pacific Halibut and Sablefish fisheries in Alaska, the marine trawl fisheries of British Columbia and for Patagonian toothfish in Chile.
161. Shotton, R. (ed.), 2001b. *Case studies on the allocation of transferable quota rights in fisheries*. FAO Fisheries Technical Paper 411. This report, consisting of 23 studies, describes how the initial allocations of transferable fishing (effort) or fish (catch) quotas have been done by a variety of fisheries management regimes. The studies include two from the European Union (The UK and the Netherlands), Iceland and three descriptions from

the Maritimes of Canada. Three studies are presented for fisheries along the eastern seaboard of the United States, though that for red snapper describes a fishery in which the actual implementation of the programme was thwarted by the imposition of the moratorium on Individual Transferable Quotas (ITQs). An omnibus account is given for the allocation process of quotas in New Zealand. In the Western Pacific, accounts are given for the Pacific halibut and sablefish fisheries in Alaska, the variety of fisheries in British Columbia including these last two species.

162. Sigler, M., Lunsford, C., 2001. *Effects of individual quotas on catching efficiency and spawning potential in the Alaska sablefish fishery*. *Can. J. Fish. Aquat. Sci./J. can. sci. halieut. aquat.* 58(7): 1300-1312. Individual fishery quota (IFQ) management eliminates the race for fish and may improve economic efficiency, conservation, and safety in fisheries. Empirical information documenting these effects is limited, even though IFQs have been used since the late 1970s. We analyzed fishery data from the Alaska sablefish (*Anoplopoma fimbria*) longline fishery, which came under IFQ management in 1995. We compared the fishery data with fishery-independent survey data, which acted as a control to separate annual changes in population demographics from changes due to IFQ management. We found that IFQ management increased fishery catch rate and decreased harvest of immature fish. Catching efficiency increased 1.8 times with the change from an open-access to an IFQ fishery. The improved catching efficiency of the IFQ fishery reduced variable costs to catch the quota from 8 to 5% of landed value, a savings averaging \$3.1 million US annually. Decreased harvest of immature fish improved the chance that individual fish will reproduce at least once. Spawning potential of sablefish, expressed as spawning biomass per recruit, increased 9% for the IFQ fishery. Switching from the open-access fishery's race for fish to IFQs provided two clear benefits that should be considered when evaluating management options for other open-access fisheries.
163. South Atlantic Fishery Management Council (SAFMC), 2006a. *Fishery Management Plans for 1) Coastal Migratory Pelagics, 2) Dolphin/Wahoo, 3) Golden Crab, 4) Shrimp, 5) Snapper Grouper, and 6) Spiny Lobster*. Retrieved March 14, 2006, from <http://www.safmc.net/Default.aspx?tabid=395>. Current and historical fishery management plans for specified fisheries.
164. South Atlantic Fishery Management Council (SAFMC), 2006b. *South Atlantic Snapper Grouper Fishery Management Plan Amendment 13C*. September. FMP for SA snapper grouper.
165. Southwick Associate and Loftus, A., 2006. *Menhaden Math: The Economic Impact of Atlantic Menhaden on Virginia's Recreational and Commercial Fisheries*. American Sportfishing Association. http://www.menhadenmatter.org/menhaden_math.pdf. Atlantic menhaden are a vital source of food for many fish species, serving as a critical link in the food chain on which a number of highly important commercial and recreational saltwater fisheries, such as striped bass, bluefish and weakfish, depend. This report, conducted by Southwick Associates and Loftus Consulting, examines the importance of a healthy and well managed menhaden stock to Virginia's commercial and recreational fisheries. Among its findings: 1) Nearly 1 million saltwater anglers cast their luck in Virginia waters each year, spending more than \$655 million for marine sportfishing

activity. The economic value of the menhaden reduction fishery in Virginia is being eclipsed by the recreational fishery for species that rely on menhaden as a food source. 2) Of the fish that saltwater anglers most like to catch – the majority depend on menhaden for survival. According to research conducted at the Virginia Institute of Marine Sciences for the Virginia Marine Resources Commission, striped bass, which rely on menhaden as a prime food source, were the sportfish most targeted by saltwater anglers. 3) According to data from the Virginia Institute of Marine Science, approximately 30 percent of the economic benefits that marine recreational angling provides to Virginia is due to sportfish dependent on menhaden as a food source. 4) Saltwater angling for fish that rely on menhaden as a key part of their diet generates 2,500 full and part-time jobs and \$236 million in overall economic activity. 5) Commercial menhaden landings generated approximately \$24 million for the Virginia economy and about 395 full time jobs.

166. Standing Senate Committee on Fisheries, 1998. *Privatization and Quota Licensing in Canada's Fisheries*. Third Report, December 1998. <http://www.parl.gc.ca/36/1/parlbus/commbus/senate/com-e/fish-e/rep-e/rep03dec98part1-e.htm>. Data on number of crew in the BC sablefish fishery. General report discusses privatization issues in Canada's fisheries.
167. Straker, G., Kerr, S., Hendy, J. 2002. *A Regulatory History of New Zealand's Quota Management System: setting targets, defining and allocating quota*. Paper presented at IIFET 2002: Fisheries in the Global Economy, International Fisheries Economic Conference in Wellington, New Zealand. http://www.motu.org.nz/pdf/IIFET_Fish_paper.pdf. In this paper we define the regulatory structure of the New Zealand Quota Management System (QMS) and document key changes in its operation over time. We document the relevant legislation that affected the quota market from the Fisheries Act 1983 forward. We describe how the QMS operates in New Zealand and how the regulations have evolved and changed to address specific issues as they come to light. We discuss the setting of aggregate targets and the definition of quota and summarize the process of allocating quota to fishers in New Zealand. This paper is part of a larger project that will also discuss market structure issues such as rules regulating quota trades, concentration of holdings, foreign ownership of quota, 'banking' provisions, and funding. The paper either directly describes the legislation or, for more detail, provides references to key resources. This will provide researchers with a reference document on the New Zealand fisheries regulatory structure as a basis for future empirical work. The version of the paper presented here is an abridged version. A full version of the working paper is available at: http://www.motu.org.nz/nz_fish.htm. This project was funded by the New Zealand Ministry of Fisheries and Resources for the Future.
168. Sullivan, K.J.; Mace, P.M.; Smith, N.W.McL.; Griffiths, M.H.; Todd, P.R.; Livingston, M.E.; Harley, S.J.; Key, J.M. and Connell, A.M. (Comps.) 2005: *Report from the Fishery Assessment Plenary, May 2005: stock assessments and yield estimates*. 792 p. (Unpublished report held in NIWA library, Wellington.) <http://www.fish.govt.nz/sustainability/research/assessment/plenary/orh3B.pdf>. Stock assessment of New Zealand Orange Roughy for 2005, including historical biomass, catch, and TAC. Orange roughy are found in waters deeper than 750 m throughout

Quota Management Area 3B. Historically, the main fishery has been concentrated on the Chatham Rise. Annual orange roughy catches in ORH 3B were mostly just over 30,000 t in the 1980s but progressively decreased since 1989–90 because of a series of TACC reductions.

169. Sullivan, K.J. (Comp.) 2004: *Report from the Mid-Year Fishery Assessment Plenary, November 2004: stock assessments and yield estimates*. 46 p. (Unpublished report held in NIWA Greta Point library, Wellington.) <http://www.fish.govt.nz/sustainability/decisions/rk-lbstr-plenary-2004.pdf>. Stock assessment of New Zealand Rock Lobster for 2004, including historical biomass, catch, and TAC. This report summarizes the conclusions and recommendations of the Mid-Year Fishery Assessment Plenary session held during November 2004, held to assess the rock lobster fishery managed within the Quota Management System.
170. Summary commercial statistics 1996-2005. Retrieved March 12, 2006, from http://www-sci.pac.dfo-mpo.gc.ca/sa/Commercial/AnnSumm_e.htm. Reports from the Department of Fisheries and Oceans, Canada, provide catch statistics (landings, value, landings by month) on BC groundfish, BC halibut, and BC sablefish from 1996-2005.
171. Terry, J., Kirkley, J., 2006. *Assessments of Excess Fishing Capacity in Select Federally Managed Commercial Fisheries*. NOAA and NMFS. March 31. There is excess capacity in many fisheries in the U.S. and elsewhere. That is, fishing capacity exceeds actual catch. Persistently high levels of excess capacity can make it more difficult to meet conservation and management objectives, including the following eight broad 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; 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 is a high priority for many countries, and it is an integral part of U.S. efforts to implement ecosystem approaches to management. This report documents fishing capacity using Data Envelopment Analysis (DEA) for major fisheries in the U.S. including specific assessments in the northeast region, highly migratory species, southeast region, Pacific coastal pelagics, Pacific islands region, and Alaskan fisheries.
172. Turriss, B. 2000. *A comparison of British Columbia's ITQ Fisheries for Groundfish Trawl and Sablefish: Similar Results from Programmes with Differing Objectives, Designs, and Processes in Use of Property Rights in Fisheries Management*, FAO Fisheries Technical Paper 404/1. In Canada, the implementation of ITQs in commercial fisheries has been slow, disjointed and generally fishery specific. There has been no general government policy supporting or recommending that fisheries move to ITQs. Indeed the move to ITQs in a specific fishery was more likely the result of a dramatic failure of the existing management regime that led front line fishery managers and associated industry participants to consider alternative management approaches. This is clearly the case in the British

Columbia commercial sablefish and groundfish trawl fisheries. Both fisheries were in unsustainable situations (in terms of stock abundance and economic viability) and the need for changing the management structure was overwhelming. Although both fisheries chose to implement ITQs and have seen similar improvements in stability, sustainability, and economic viability, the objectives and processes used to bring about the ITQ programmes differed significantly and resulted in programme designs with more differences than similarities. While some of the differences are entirely an artifact of the species harvested and the gear used, others are characteristic of the breadth of participants and their social and political views. The paper 1) provides some background to both the sablefish and groundfish trawl fisheries and how they evolved from limited entry derby fisheries to ITQ fisheries, 2) provides a brief description about each ITQ programme and the rules, which govern the fishery, 3) poses a number of retrospective questions and answers to give a feel for how well, or poorly, the programme has done and the level of support from various industry participants, and 4) looks into the future and discuss the direction these programmes may take and changes that may be forth coming.

173. U.S. Commission on Ocean Policy. 2004. *An Ocean Blueprint for the 21st Century*. Final Report. Washington, DC.
http://www.oceancommission.gov/documents/full_color_rpt/welcome.html. Study by a commission created by the U.S. Congress to draw a blueprint for a new, comprehensive, and sustainable ocean policy. The report provides recommended actions on the topics of improved governance, sound science for wise decisions, improving ocean education, specific fishery and watershed management issues, and implementation of a trust fund to support improved management.
174. Virginia Marine Resources Commission (VAMRC), 2006. *Commercial crabbing in Virginia Tidal Waters*. Retrieved September 10, 2006 from
<http://www.mrc.state.va.us/regulations/commercialcrabbingrules.shtm>. Includes information on VA licenses, and fishery management measures.
175. Wang, S.D., and Tang, V.H., 1994. *The Performance of U.S. Atlantic Surf Clam and Ocean Quahog Fisheries under Limited Entry and Individual Transferable Quota Systems*. Gloucester, Mass.: National Marine Fisheries Service, Northeast Regional Office. Detailed report on the surf clam and ocean quahog fishery including economic analyses, concentration, effort.
176. Wang, S., Tang, V., 1996. *The Surf Clam ITQ Management: An Evaluation*. Economic status of U.S. fisheries. Summary of surf clam ITQ including historical data on vessels and fishery effort (hours fished).
177. Weeks, H., Hutton, L. 1997. *Shoreside Whiting Observation Program: 1997*. Marine Finfish Program, Oregon Department of Fish and Wildlife.
http://hmsc.oregonstate.edu/odfw/reports/wh1997_rpt.pdf. The Pacific Whiting Shoreside Observation Program was established in 1992 to provide information for evaluating bycatch in the directed Pacific whiting fishery and for evaluating conservation measures adopted to protect salmon and other prohibited species. The program has been continued annually in order to account for all catch in targeted whiting trips and to accommodate the landing of non-sorted catch from these trips. In

1995, the program changed its emphasis from a high target rate of observation (50% of landings) and a focus on prohibited species to a lower target rate of observation (10% of landings) and the collection of biological samples and information (otoliths, length, age, weight, sex, maturity) from Pacific whiting and selected bycatch species (yellowtail and widow rockfish, sablefish, chub (Pacific) mackerel, jack mackerel and prohibited species). The program is a cooperative effort between the fishing industry and management agencies to observe and collect information on directed Pacific whiting landings at shoreside processing plants.

178. [Weninger, Q., 2006. Iowa State University. Personal correspondence on May 12, 2006.](#) Personal correspondence on number of crew per boat in the MA surf clam and ocean quahog fishery post-DAP.
179. [Whiting season summary, 2000, Retrieved May 18, 2006, from
http://www.pcouncil.org/groundfish/gfsafe1000/whit9400.pdf.](#) Report documenting fleet size, season length, and bycatch behavior of the Pacific whiting fishery from 1994-2000.
180. [Woodley, LT C., 2000. *Quota Based Fishery Management Regimes*. International Fishing Industry Safety and Health Conference: Innovative Approaches to Investigating and Preventing Fishing Vessel Casualties. October 24, 2000.](#) Report documenting safety considerations, including fatality rate, search and rescue missions, in Alaska fisheries. This paper explores the connection between fishery resource management and the safe operation of fishing vessels by focusing primarily on safety problems found in the Bering Sea/Aleutian Island (BSAI) King and Tanner crab fishery off the coast of Alaska. The paper then compares and contrasts the different fishery management regimes (including ITQs) that currently exist in the BSAI management areas. The purpose of this review is to consider how different management regimes influence safety and how changes in fishery management can potentially improve safety.