Winter 2003



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President's Log

Dear Marine Fisheries Section Members:

Two years ago, in Michigan, far from the ocean, I learned that you had elected me to serve as President-Elect of our section. That was the beginning of my journey towards more salty waters. I have been at the Northeast Fisheries Science Center now for two years and am grateful for the opportunity you afforded me to serve this section. Thank you! My work and success as President of the Section is entirely dependent upon the tremendous support and enthusiasm of the Executive Committee – John Hoenig, President-Elect, Anne Richards, Past-President, and Debra Murie, Secretary-Treasurer. Their tireless efforts to improve the visibility of the Section, to support the professional development of our members, and to facilitate the exchange of information among marine scientists is very much appreciated. I also wish to acknowledge and thank Donna Johnson for volunteering to compile and edit this newsletter. Please let Donna know what an outstanding job she has done for us! It's been some time since we circulated a newsletter among section members, so let us know if you wish to see more or less material, different items, and especially if you wish to contribute to the writing.

I want to briefly review some of the notable events that have occurred since the AFS annual meeting in Baltimore. During the Incoming AFS Governing Board Breakfast, President Fred Harris noted his interest in focusing on marine fisheries issues and encouraging AFS membership of marine professionals. He invited Dr. Bill Hogarth, Assistant Administrator for Fisheries (NOAA-Fisheries), to address the Governing Board and discuss ways in which AFS and NOAA-Fisheries can work together. As an outcome of that, President Harris has asked Linda Bireley, President of the Estuaries Section and me to serve as co-chairs for the Ad Hoc Committee, Definition of Goals for Marine Fisheries Management. Linda and I will be working together with Fred Harris and Bill Hogarth to identify an approach to facilitate AFS input and guidance to NOAA-Fisheries. President Harris is committed to ensuring representation by the Marine Fisheries Section on various key AFS committees and has made numerous requests for volunteers to serve. You have seen my invitations through recent e-mail messages. I am happy to report that the response of the Section has been strong and in each case we had more volunteers than we had opportunities. President Harris and I continue to work on identifying ways we can offer opportunities to those who wish to serve AFS and voice the needs and concerns of the Marine Fisheries Section. One other event occurred that I want to share with you and that is that I was elected by the Governing Board to serve on the AFS Management Committee, a group of 14 AFS leaders who function as the Executive Committee of the AFS Governing Board. For those of you who are less interested in the governance of the Society, this may seem like an awful appointment. On the contrary, it is a great honor to serve on this committee representing Marine Fisheries, and to be able to influence the decisions of the Society. I follow in the footsteps of three previous MFS Presidents, John Boreman, and Max Stocker, who served on this Committee in the past. More information on the function of the Management Committee is provided in the AFS Constitution (available at the AFS web site: www. fisheries.org). I'll wrap up this message by saying that this year is an important one for the Marine Fisheries Section – we are being challenged to improve OUR visibility in AFS. Our

members are eager to volunteer, to share their thoughts, and to lend a helping hand. I thank you for all your well wishes and support during these past few months. Please let me know if you have any issues or concerns that you would like the Section (and AFS) to address.



-Mary.

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Local Shores

INVASIVE CRABS SWARM UP EAST COAST

ITHACA, New York, July 19, 2002 (ENS)

Invasive Japanese shore crabs have been discovered on the shores of Maine's Penobscot Bay. The crabs pose a direct threat to soft shell clams. mussels and lobsters, say the Cornell University marine biologists who found the crustaceans in Owl's Head, Maine on July 13. Penobscot Bay is now the most northern point along the Atlantic seaboard where these crabs have been found.



(Courtesy of Jerry Prezioso)

For the full story, see: ens-news.com/ens/jul2002/2002-07-19-09. asp#anchor5

---SOURCE: Environment News Service. Ameriscan, July 19, 2002. Copyright Environment News Service (ENS) 2002

SHARK FIN TEST CAN IDENTIFY SPECIES



(noaa.gov)

DANIA BEACH, Florida, July 23, 2002 (ENS)

A new test can identify shark species from just their fins, promising to aid enforcement of the U.S. ban on shark finning.

Shark finning, chopping off the fins and tossing the rest of the animal back into the sea, is increasing worldwide to satisfy the demand in Asian markets for shark fin soup. The U.S. National Marine Fisheries Service has banned shark finning in federal waters of both the Atlantic and Pacific Oceans, the Gulf of Mexico and the Caribbean Sea.

For the full article, see:

ens-news.com/ens/jul2002/2002-07-23-09.asp#anchor6 ---SOURCE: Environment News Service, Ameriscan, July 23, 2002.

Copyright Environment News Service (ENS) 2002.

SEA TURTLE BILL

WASHINGTON, DC, Sept. 6, 2002 (ENS)

Sea turtle bill would protect international habitat. U.S. Senator Jim Jeffords of Vermont introduced a bill aimed at helping preserve the nesting habitats of marine turtles in foreign countries. "This legislation will help to preserve this ancient and distinctive part of the world's biological diversity," Vermont senator said in submitting the Marine Turtle Conservation Act of 2002 (S 2897).

The bill was referred to the Senate Environment and Public Works Committee. Jeffords, who left the Republican Party last year to

become the only Independent in the Senate, chairs that committee.



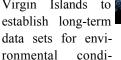
(noaa.gov)

For the full article, see: <http://ens-news.com/ens/ sep2002/2002-09-06-09.asp#anchor6> ---SOURCE: Environment News Service, Ameriscan, September 6,

2002. Copyright Environment News Service (ENS) 2002.

Coral Reef Monitoring

Scientists with the National Oceanic and Atmospheric Administration (NOAA) recently completed installation of a coral reef monitoring station in the United States Virgin Islands to establish long-term



(noaa.gov)

tions. The station is the second part of the Coral Reef Early Warning System (CREWS) network, but with a radically new design. (www.coral.noaa.gov/crw)

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THE COST OF HATCHERY SALMON

In the Columbia basin, the economic counterpart to the Independent Scientific Advisory Board, the Independent Economic

Advisory Board, has released the first of a series of analyses of the cost of producing and catching hatchery salmon. They studied 8 hatcheries in the Columbia River Basin as their initial project, and confined their analyses mainly to Chinook salmon.

The hatcheries ranged in location from near the mouth of the river to well into the interior CRB. In the words of chairman Dan Huppert: "Based on the information assembled to date, the costs per [smolt] release varied among the

eight projects from \$0.14 for Spring Creek hatchery fall Chinook to \$2.60 for Nez Perce spring and fall Chinook. The costs per returning adult [to the hatchery] varied from \$12 for Priest

Rapids fall Chinook to \$1,615 for Winthrop hatchery spring Chinook to \$3,707 for Nez Perce hatchery Chinook.

> The costs per adult fish harvested varied from \$14 for Clatsop County Economic Development Council Coho releases in Youngs Bay, to \$23 for Priest Rapids fall Chinook, to \$68,031 for Entiat hatchery spring Chinook." (Harvested fish included salmon caught in commercial, tribal, and sport fisheries)

For more information go to: www. nwcouncil.org/library/ieab/ieab2002-1.htm (from Fish Tales, US Forest Service)



(www.nps.gov)

NO ENDANGERED LISTING FOR WHITE MARLIN

WASHINGTON, DC, September 5, 2002 (ENS) The National Marine Fisher-Service (NMFS) announced that the Atlantic white marlin, a billfish that lives in the tropical and temperate waters the Atlantic Ocean, does not warrant listing as threatened endangered o r under the Endangered Species (E S A) . Act

In September 2001, NMFS was petitioned to list Atlantic white marlin endangered or threatened throughout its range and to designate critical habitat under the ESA. The ESA defines an endangered species " a s a n v species which is in danger of extinction throughout all or a significant portion of its range."

For the full story, see: http://ens-news.com/ens/ sep2002/2002-09-05-09. a s p # a n c h o r 4 >---SOURCE: Environment News Service, Ameriscan, September 5, 2002. Copyright Environment News Service (ENS) 2002.



(noaa.gov)

ALL SPECIES FOUNDATION

dation (http://www.allcomplete inventory of all spedaunting task has effective conservation, environmental impact studies, and

"The ALL Species Foun- functioning. An important feature of the site is the Spespecies.org/) is a non-profit cies Search Engine that inorganization dedicated to the cludes over 1 million species. An organism can be found

cies of life on Earth." This by partial or complete name; either scientific or common important implications for names are recognized. Each entry provides a link to o n e o f understanding ecosystem databases for more information on the species.

>From The NSDL Scout Report for the Life ScIences. Copyright Internet Scout Project 1994-2002. http://scout. cs.wisc.edu/

"...a non-profit organization dedicated to the complete inventory of all species of life on Earth"

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International Bites

NORTH SEA COD AND OTHERS DECLINE



(news.bbc.co.uk)

In a development that scientists have predicted for years, cod have virtually vanished from the North Sea due to overfishing, according to a report by the U.K.-based Wildlife Trusts. The species is now commercially extinct, meaning it no longer makes economic sense to try to catch it. The report also chronicles the decline of other species, ranging from the horse mussel to the sunset coral. Especially

at risk is the bottle-nosed dolphin, which could become extinct in British waters within a decade. The dolphin population has already declined precipitously, in some areas, by as much as twothirds, with many dolphins falling victim to fishing nets. WildlifeTrusts is calling for stricter fishing laws to protect the bottle-nosed dolphin and other species. For the full article, see: www.gristmagazine.com/forward.pl?forward_id=262---SOURCE: Grist Magazine, BBC News, Alex Kirby, July 16, 2002.

"The cod crisis is one of many facing the international community as countries compete for thinning stocks in the world's once fish-thick seas."

NORTH SEA COD CRISIS BRINGS CALL FOR NATIONS TO ACT

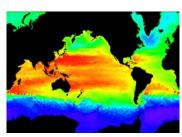
By CRAIG S. SMITH ILLELEJE, Denmark, Nov. 3 — The cod are disappearing from the deep gray waters that stretch to the horizon from this gull-festooned town, a stark reminder that there is a finite number of fish in the sea and that man's growing appetite for seafood, if left unchecked, could eventually drive many species to extinction.

Scientists warned last month

that unless almost all commercial fishing in the North Sea was banned, the cod stocks might soon collapse, meaning that the number of cod necessary to repopulate the overfished region could fall so low that the popular food fish might never recover. "The cod are now so depleted we're not really sure of their population dynamics," said Henrik Sparholt, a fisheries assessment scientist at the International Council for the Exploration of the Sea, which has advised closing the North Sea to most fishing indefinitely. Mr. Sparholt said the number of North Sea cod was at its lowest level ever and was half of what was considered the minimum for assured propagation.

(For the complete story see The NY Times Co.)

Antarctic Marine Life Vulnerable to Climate Change



(www.csm.ornl.gov)

CAMBRIDGE, UK, September 10, 2002 (ENS) Global warming is changing the life patterns of marine spe-

the life patterns of marine species in Antarctica as fast, if not faster than anyplace on Earth, say scientists from the British Antarctic Survey (BAS). Thousands of Antarctic marine species, adapted to constant temperatures for millions of years, now appear

to be uniquely vulnerable in the face of predicted temperature change, new research reveals.

For the full story, see: http://ens-news.com/ens/sep2002/2002-09-10-04.asp

---SOURCE: Environment News Service, September 10, 2002. Copyright Environment News Service (ENS) 2002 Volume 19. Issue 1 Page 5

Captive Breeding of Bluefin Tuna

A Japanese research institute has announced the first successful breeding of bluefin tuna in captivity, but WWF believes that this will not help the declining Mediterranean bluefin tuna stocks to recover and would even contribute to greater exploitation of other fish stocks. Not only will it take some more years to commercialize the breeding technique, it will also increase fishing pressure on smaller fish species that serve as food supply for the predatory tuna fish. Tuna has been severely overfished during the past decades due to its high market demand, in particular in Japan.



For further information, contact:

Anne Remy, WWF

---SOURCE: EUCC Coastal Guide News, No 14, July 12, 2002.

Tel::39.06.84497.424

West Greenland Beluga Whales at Risk of Extinction

TROMSO, Norway, September 12. (ENS)

Beluga whales in West Greenland waters are too few in number continue with present



For the full story, see: http://ens-news.com/ens/ sep2002/2002-09-12-01. asp>

(noaa.gov)

---SOURCE: Environment News Service, September harvesting levels, according to a newly published 12, 2002. Copyright assessment by the North Atlantic Marine Mammal Environment News Service Commission (NAMMCO). Present harvests are several (ENS) 2002 All Rights times the sustainable yield, and, if continued, will likely Reserved.

Ocean Protection

JOHANNESBURG South Africa, September 3, 2002 -

Drawing on a new emphasis on the interrelationships between ecosystems, the United States is preparing to launch a new initiative that aims to protect ocean ecosystems by cleaning up land based sources of pollution. The White Water to Blue Water initiative was announced Monday at the World Summit for Sustainable Development in South Africa. http://ens-news.com/ens/ sep2002/2002-09-03-06.asp

Whale Sharks

SANTIAGO, Chile (Reuters) - by Alistair Bell

lead to extinction of these white whales "within 20

years," warns a scientific committee of the commission.

The world's biggest type of fish is a shark twice as long as a

(noaa.gov)

bus and cruises the ocean surface with its huge mouth open in search of prey. But, in a reversal of the idea that sharks are voracious peoplekillers, the Whale Shark is in fact a docile plankton feeder which is more victim than predator. Prized in Far East-

ern cuisines, the Whale Shark and its smaller cousin the Basking Shark have been hunted so thoroughly in recent years that a U.N. meeting in Chile is considering protecting them from

The U.N. Convention on International Trade in Endangered Species (CITES) meeting until Nov. 15 will decide whether to tighten trade in the two shark species until scientists can find

out if they are endangered or

"They are the world's largest fish but there's not a lot we know about them," Britain's animal health minister, Elliot Morley, told Reuters on Thursday.

Britain is sponsoring a European Union motion to protect the Basking Shark, found in temperate and cold waters. India and the Philippines have put forward a similar proposal on the Whale Shark, which inhabits warmer seas.

No exact figures are avail-

able for the populations of either fish. The Basking Shark is an elusive creature which appears for only a few months a year in coastal areas.

"It is a species which has declined in relation to sightings and it has become a cause for concern in European Union waters," Morley said.

The Whale Shark can grown up to 60 feet in length and can migrate as far as 13,000 miles at a time but it is a gentle giant.

(For complete story Reuters)

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Marine Fisheries Legislation

By Dave Allison, Allison Associates

As congress moved slowly to the end of session, it became clear that there would be no reauthorization of the Magnuson Stevens Act (MSA) this year. Both Mr. Gilchrest (R-MD) and Senator Kerry (D-MA) indicated that they would NOT be advancing their reauthorization bills this year. It seems equally clear that Mr. Gilchrest and Sen. Kerry were interested in moving legislation to establish some equity and conservation standards for any future Individual Fishing Quota (IFQ) programs developed by the Councils or the Secretary. Key questions and issues seemed to be how to assure equity in initial and subsequent allocation of quota shares, means of establishing hard sunsets for allocations, internal funding provisions to pay for the program and how to make certain that the standards would be enforced. One draft bill that was being circulated and may return next session mandates the use of royalty auctions as a means of addressing some of those issues.

In addition, there continues to be bipartisan support for a national license and vessel buy-back program. Major questions on that issue seem to be whether the buyback program will be funded by industry or through federal grants and whether the program will be national or regional in scope. Other issues are mechanisms to determine whether and when the buyback options would become available to fishermen.

The opposition of the National Fisheries Institute, Inc. (NFI), some major sportfishing organizations and the Marine Fish Conservation Network to provisions of the Gilchrest legislation were one severe wound in efforts to reauthorize the MSA this year. In addition to that, both the Pew Oceans Commission and Ocean Policy Commission are preparing to issue their reports and recommendations between now and early summer and there was reducing energy for engaging in a contentious issue like the MSA. The final spear in the legislative effort may have been the combination of the slow and now congested pace of dealing with the 13 spending bills, the review of proposals to go to war with Iraq and the battle over the Homeland Security reorganization, all of which the President insisted be dealt during this past session of congress. Not much room for fish.

The IFQ moratorium, like the self-imposed limits on Congressional spending, expired the end of September. The equity and conservation standards, like those proposed in the NRC report, must be established if we are to avoid a rush to the privatization windfalls of unfettered Individual Transferable Quotas (ITQs) that threaten the stability of the distributive nature of the fishing communities around the US coasts. Many expected Congress to act on at least the IFQ and buyback MSA issues prior to Congress's formally scheduled departure in early October. But the very closeness of the split between the political parties, especially in the Senate, kept fishery issues, as well as other, higher profile, resource, military, security and budget issues, in contention till nearly Christmas.

As Congress moved to a close there was one pending piece of fisheries legislation that could have been a vehicle for the IFQ standards and fisheries license buyback legislation. But the necessary players could not agree on those critical issues. Absent that, the legislation could have been attached to a spending bill or continuing resolution (CR) with substantial support and little opposition. The CR is an action by Congress which says, in effect, "we could not agree on new numbers for spending next year so we will allow all of the agencies to spend at the same level next year as they did last year. We will let you know when we can agree and then will set the new numbers." The CR was the alternative to an endless "lame duck" session if Congress could have taken care of all of the issues they considered essential except for the budget before they adjourned. A lot of irrelevant issues can be incorporated in a CR if the leadership is willing to push the strategy. Finally, the decision in the November elections gave both parties good reason to just issue a "clean" CR with no riders, go home, leave the difficult issues behind them and start again on all of them in the new session.

So, we can look forward to having every fisheries resource issue that was raised and discussed last year back on the table as the next Congress begins the next two years. We can anticipate that, with the increasing pressures to shift the balance between economics and ecosystems, the importance of the involvement of fisheries professionals in the decisions Congress will make in these coming years will be greater than ever.

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Fish Politics

Endangered Species, special interests, overfishing: How does a restaurant decide what to put on the menu?

By Judith Weinraub Washington Post

Wednesday, November 6, 2002; Page F01

Which of these statements is true? Eating Chilean sea bass is an act that could lead to its extinction. Fish that are bred in a fish farm are nowhere near as healthful as the line-caught version of the species. People who cooked or ate swordfish in the 1990s were committing an environmentally reprehensible act. The answer in each case is: It depends. It depends where the fish comes from, and how it was caught and whether government quotas were abided by. But finding out for certain can be difficult. Yet every day, particularly in the Washington area, chefs are expected not only to cook to perfection but also to know if the fish on their menus is endangered, caught in an environmentally sound manner or raised according to politically correct standards. If they don't, the chefs risk being labeled profligate and insensitive to the needs of the planet. This is the world of fish politics, and if you're running a restaurant, it's getting more complicated every day. You have to know the law (or rely on your supplier's information and honesty). You have to be up to speed on the issues. And you have to please your customers. Chefs have had to respond to the "Give Swordfish a Break" campaign, which started in 1988 and urged chefs to boycott North Atlantic swordfish. And the striped bass ban. And concerns about red snapper. Halibut. Cod. This year, the hapless Patagonian toothfish (rechristened more temptingly Chilean sea bass) has been targeted by the National Environmental Trust (NET) as a fish no environmentally right-minded chef would even think of serving. And this fall, the Center for Food Safety, Clean Water Action and Friends of the Earth asked chefs, grocers and seafood distributors to sign a pledge not to buy or sell fish that was altered by genetic engineering. And those fish aren't even on the market yet, so chefs couldn't buy them if they wanted to. (For full story see: Washington Post, Nov. 6, 2002.)

Action Plan on Better Fisheries Data

At a meeting with the International Council for the Exploration of the Sea (ICES) on July 1 2002, the European Commissioner Franz Fischler announced that he will shortly present an Action Plan for the improvement of scientific advice for fisheries management.

To improve the quality and timeliness of scientific advice, the Commission Action Plan will propose measures that include:

- a) improvement in data collection, extended to include environmental impact;
- b) improved support at national and community level for scientific work in scientific advisory bodies and implementation of appropriate validation and peer-review processes;
- c) reinforcement of community structures for scientific advice, in particular the Scientific Committee for Fisheries and Aquaculture (SCFA);
- d) closer coordination between the Commission and national fisheries research laboratories concerning priorities and resource allocation in this area. Fishermen are not only at the receiving end of scientific advice but also at its source

The reform of the Common Fisheries Policy of 28 May 2002 is now online at:

europa.eu.int/comm/fisheries/reform/proposals_en.htm

Complete press release at

europa.eu.int/comm/fisheries/news corner/press/inf02 17 en.htm

---SOURCE: EUCC COASTAL GUIDE NEWS, No 14, July 12, 2002.

FROM THE AFS DIARY

- ⇒It has been the aim of AFS to rectify the omission of one of it's journals from the ISI databases that cover scientific publications. Beginning with issues published in 2002, ISI is including the North American Journal of Fisheries Management in the ISI "Current Contents Agriculture, Biology & Environmental Sciences" and "Science Citation Index Expanded."
- ⇒More than 1600 fisheries scientists and professionals met in Baltimore, Maryland, for the AFS **Annual Meeting**. They came from all disciplines and geographies, to hear the current state of the art in fisheries science and management, to sample the great fare of the Chesapeake Bay, to enjoy the proximity to Washington, DC, and simply to meet each other, renew old acquaintances and friendships, and to hear that their Society is thriving with many new, and exciting, projects. The first phase of Fisheries InfoBase was demonstrated at the meeting as well as half a dozen new books that AFS has recently published.



Marine Fisheries Section Newsletter Donna L. Johnson, Editor

NOAA/NMFS/NEFSC

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WE'RE ON THE WEB! http://www.nefsc.noaa.gov/mfs/

The Marine Fisheries Section (MFS) is a professional, interest based, subunit of the American Fisheries Society. The intent of the MFS is to further the Society's objectives within marine fisheries science and practice. MFS members wish to attain further knowledge about marine fisheries, and to identify and publicize issues and problems related to development and management of marine fisheries. MFS also addresses research and education needs associated with biological, economic, social, and other aspects of marine fisheries.

Through the MFS Newsletter, and web page, the Section:

- encourages and facilitates the exchange of knowledge and ideas
- updates members on current research, issues, publications, and meetings
- communicates Section and AFS business and concerns

The Section also fosters the exchange of knowledge and ideas through:

- organizing meetings/symposia usually at the AFS Annual Meeting
- publishing conference and symposia proceedings
- ad-hoc committees created to comment on specific issues

To facilitate communication among members the Section provides a periodically updated membership directory.

AFS - Catch of the Day

Awards:

- <u>Fred Utter</u> (AFS member & journal editor 1986) was honored by Trout Unlimited and was the recipient of the 2002 WINN MEMORIAL AWARD FOR SEARUN FISHERIES CONSERVATION.
- Barbara Knuth was selected as one of two Northeast region recipients of the U.S. Dept. of Agriculture Food and Agriculture Sciences Excellence in Teaching Awards.

Received at AFS:

- National Fish Strain Registry—Trout; Species Tables of Reported Strains and Broodstocks, by Harold Kincaid et al, US Fish and Wildlife Service and US Geological Survey (http://far.nbii.gov), August 30, 2002, 174 p.
- 2002 Michigan DEQ Environmental Quality Report, Michigan Department of Environmental Quality, (www.michigan.gov/deq/0,1607,7-135-3308 7255---,00.html), 2002, 54 p.
- Fisheries of the United States, 2001, National Marine Fisheries Service, Current Fishery Statistics No. 2001, September 2002, 126 p.
- Conserving America's Fisheries, A Proud Past, A Bright Future, US Fish and Wildlife Service, 2002, series of loose sheets (success stories)

Notable Links:

- How toxic and harmful algae may contaminate fish and shellfish..see www.bigelow.org/hab/index.html
- Last year, MIT announced debut of a **free course material** site...OpenCourseWare....<u>ocw.mit.edu</u>
- New portal for **coral reef data**... <u>www.coris.noaa.gov</u>
- NE Fishing Communities at http://web.mit.edu/seagrant/advisory/marin/index.html
- Ocean Policy report at <u>www.oceancommission.gov</u>

New Books from AFS:

- Fisheries in a Changing Climate; August 2002; Nature A. McGinn, editor.
- Catch and Release in Marine Recreational Fisheries; August 2002; Jon A. Lucy and Anne L. Studholme, editors.
- Large Marine Ecosystems in the North Atlantic; K. Sherman and H.R. Skjoldal editors. (www.elsevier.com/locate/isbn/0-444-51011/)
- Biological Indicators of Aquatic Ecosystem Stress; August 2002; S. Marshall Adams, editor.
- Whirling Disease: Reviews and Current Topics; July 2002; Jerri L. Bartholomew and J. Christopher Wilson, editors.
- Incorporating Uncertainty into Fishery Models; June 2002; Jim M. Berkson, Lisa L. Kline, and Donald J. Orth, editors.
- Biology, Management, and Protection of North American Sturgeon; June 2002; Webster Van Winkle, Paul J. Anders, David H. Secor, and Douglas A. Dixon, editors.
- Fishes of Alaska; April 2002; Catherine W. Mecklenburg, T. Anthony Mecklenburg, and Lyman K. Thorsteinson, authors.
- Fish Hatchery Management, Second Edition; January 2002; Gary A. Wedemeyer, editor