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President's Message

I have been an Editor for the Transactions of the American Fisheries Society for the past five years. I think that the three most important things to know about being an Editor are diplomacy, diplomacy and diplomacy. Anyone that takes the time to communicate their research to others deserves respect. Unfortunately not every paper can be accepted, but all authors benefit from the peer review process. It is remarkable that people in our profession volunteer their time and experience to review the reporting of research by their colleagues with almost no recognition for this community service. Reviewers comments tend to be extensive. Authors benefit from the comments and their revised papers are always shorter, more focused with clearer statements of relevance. My advice to authors is to submit papers as notes if your study is restricted by time or data. Full papers should also be as short as possible. Use the Introduction to introduce the project and not the field. Use the first sentence of each paragraph to introduce the thoughts in the paragraph. Use the first paragraphs of the Discussion to identify the linkages of the results to the purpose of the study. Ask a colleague to read you paper before it is submitted. You may also ask for advice about a manuscript from AIFRB as we provide a friendly review to members. Jack Helle and I will either review the paper or find an appropriate member. Well written papers make a difference during the review process. The best way to access the friendly review service is to contact me at Richard.Beamish@dfo-mpo.gc.ca and I will try to track down Jack Helle.

Dick Beamish, April 2011

MEMBERS: Please renew your dues.

NOAA names new ship for Reuben Lasker

The newest addition to NOAA's fleet of research vessels will be named for Reuben Lasker who lead the Southwest Fisheries Science Center's Coastal Division in the 1980s. Reuben Lasker was awarded the AIFRB Outstanding Individual Achievement Award in 1988. Below are a few tributes to Reuben.

It gives me great pleasure, plus no small measure of pride, to announce that NOAA's newest fisheries research vessel will be named after one of our own - Reuben Lasker. Dr. Lasker served as Director of our Fisheries Research Division as well as adjunct professor at SIO before his untimely death in 1988. He built a renowned research group that focused on the early life ecology of pelagic fishes. The goal was to elucidate those factors that controlled recruitment and hence population growth and productivity - a topic with implications for fisheries throughout the world. He was generous with his ideas and his time, and he had a talent for inspiring all those who came in contact with him. He is responsible for much of the scientific reputation that SWFSC enjoys; his integrity and qualities as a colleague reflect the best in all of us; and I am thrilled that we are able to preserve his memory in such a prominent fashion.

Cisco Werner, Director, Southwest Fisheries Science Center

It is a fitting tribute, to say the least, to have the FSV6 named after Reuben. Reuben would be absolutely thrilled. I first met

Reuben at the FAO tuna conference in 1962. At that early date he was enthusiastically committed to understanding the physiology of fishes and the life and death of fish larvae. His enthusiasm for his scientific work enveloped the SWFC in its entirety and served as inspiration to his colleagues and friends. When I was at the Center I had privilege of being associated with Reuben as he developed the stable ocean hypotheses. Sadly, he planned to present an important paper at our NATO conference, Toward a Theory on Biological-Physical Interactions in The World Ocean" at the Chateau de Bonas. Unfortunately, his cancer became so advanced that he could not travel, but in some characteristic way he submitted his paper("Food Chains and Fisheries: An Assessment After Twenty Years") and it was published in the proceedings of the Conference.

Brian Rothchild, Former Director, Southwest Fisheries Science Center

Reuben was a great scientist and leader and he deserves the recognition. One of his legends was SARP (sardine and anchovy recruitment project) started by him in 1984, which later evolved into SPACC (Small pelagic fish and climate change program) led by John Hunter in 2004.

Nancy Lo

Those of us who had the privilege of working for Reuben fondly remember his warmth and humor. I still remember his impish grin when he related how he came upon the subject of his doctoral thesis. He had just arrived at Stanford and opened up an old book, out crawled an insect. His thesis became "The nutrition of the silverfish, Ctenolepisma lineata, with special reference to cellulose digestion."

John Butler

Anniversary of Magnuson Act

As we look towards Earth Day next week, I want to acknowledge and highlight the 35th anniversary of the Magnuson-Stevens Fishery Conservation and Management Act. Simply called "the Magnuson Act," this law, its regional framework and goal of sustainability, has proven to be a visionary force in natural resource management - both domestically and internationally. The Magnuson Act is, and will continue to be, a key driver for NOAA as we deliver on our nation's commitment to ocean stewardship, sustainable fisheries, and healthy marine ecosystems.

Because of the Magnuson Act, the U.S. is on track to end overfishing in federally-managed fisheries, rebuild stocks, and ensure conservation and sustainable use of our ocean resources. Fisheries harvested in the United States are scientifically monitored, regionally managed and legally enforced under 10 strict national standards of sustainability. This anniversary year marks a critical turning point in the Act's history. By the end of 2011, we are on track to have an annual catch limit and accountability measures in place for all 528 federally-managed fish stocks and complexes. The dynamic, science-based management process envisioned by Congress is now in place, the rebuilding of our fisheries is underway, and we are beginning to see real benefits for fishermen, fishing communities and our commercial and recreational fishing industries.

But, we did not get here overnight. Our Nation's journey towards sustainable fisheries has evolved over the course of 35 years. At this particular moment, it is important to take time and reflect back on where we have been to understand where we are and fully appreciate the historic visions and strategic investments that got us here, particularly by the Act's principal architects, the late U.S. Senators Warren G. Magnuson of Washington State and Ted Stevens of Alaska.

To appreciate the history of the Magnuson Act is to appreciate the history of environmental stewardship in the United States and the progress made in conservation over the last three decades. The Magnuson Act was ushered in during the era of environmental consciousness that still defines our nation's stewardship ethic today. Signed into law on April 13, 1976, the Magnuson Act followed passage of other laws dedicated to addressing the environmental damage incurred after decades of unfettered industrialization. These laws include the National Environmental Policy Act (1969), the Clean Air (1970) and Clean Water (1972) Acts, and the Marine Mammal Protection (1972) and Endangered Species (1973) Acts, along with newly established agencies to implement them — the Environmental Protection Agency and National Oceanic and Atmospheric Administration. It was the beginning of a new era.

In 1976, federal management of marine fisheries was virtually non-existent. With the exception of state managed waters, federal activities were limited to supporting a patchwork of fishery-specific treaties governing international waters, which at that time existed only 12 miles off our nation's coasts. A primary impetus of the Magnuson Act was to extend the U.S. exclusive economic zone (EEZ) out to 200 miles and eliminate competition from the foreign fishing fleets off our coasts.

However, even in its initial form, Senator Magnuson saw fit to focus on conservation as a centerpiece of the new law. Modeled on the basic principles of scientific management, including the notion of standards and catch limits, the law also included an innovative regional public-private management framework – creating the fishery management council system. The Magnuson Act laid the foundation for what has matured into the regional, science-based, and transparent fishery management process which exists in the U.S. today.

We all know too well the initial victory for conservation was short lived. Without effective regulatory restraints in place, by the late 1980s Americanization of the fleet and advancements in fishing technologies over ran the slower-growing science and management infrastructures, exploding the rate of domestic driven overfishing and quickly leading to the depletion of some

of our Nation's most iconic fisheries – perhaps the most painful being the historic collapse of our Nation's oldest fishery, the New England groundfish fishery. The Magnuson Act was at a turning point. The 1996 amendments to the Act provided needed adjustments, including a new focus on habitat and the requirement for a 10 year rebuilding timeline.

Since that time, the Magnuson Act has undergone several reauthorizations – each one building upon and strengthening the previous. The most recent and transformative change was in 2007, under the leadership of Senator Stevens whose commitment to sustainable use - and growing concern over unsustainable fishing practices internationally - helped galvanize the earlier vision of Senator Magnuson. In 2007, Congress gave NOAA and the regional fishery management councils a clear mandate, new authority, and new tools to achieve the goal of sustainable fisheries within measureable timeframes. Notable among these were the requirements for annual catch limits, and accountability measures to prevent, respond to, and end overfishing – real game changers in our national journey towards sustainable fisheries, and ones that are rapidly delivering results.

Today, many stocks that were overfished are rebuilt or actively rebuilding. Successes include summer flounder, monkfish, scallops, ling cod, sablefish, North Atlantic swordfish, vermillion snapper, and gag grouper to name a few. Even the iconic Northeast groundfish fishery is turning the corner with anticipated higher catch levels allowed for 12 of the 20 groundfish stocks in the 2011 fishing season – the first time this has happened in over a decade.

Much of this progress has been the result of collaborative involvement of our U.S. commercial and recreational fishing fleets and their commitment to science-based management, improving gear-technologies, and application of best-stewardship practices. Supported by the hard work of the regional fishery management councils whose innovative, management strategies have allowed fishermen to grow with stocks. One notable new development, emphasized in the 2007 reauthorization, was a focus on consideration of catch share programs. Catch share programs promote fishing based on good business decisions and stewardship practices rather than on the earlier years of 'race-to-fish' or 'days-at-sea' strategies that were often as dangerous for crews as they were unsustainable for the resource.

The success of the regional fishery management framework – and its ability to reflect the ecological and socio-economic needs unique to each region – is also influencing growth and improvement in management of international fisheries that now organize as 'regional fishery management organizations'.

Today, the Magnuson Act - at 35 years of age - is at another turning point in its journey – one involving a more inclusive collaboration between fishing industries, conservationists, consumers and the broader seafood supply chain. At this point, we are turning the corner towards a future when ending overfishing can be a concern of the past, and where maintaining sustainable fisheries is a shared commitment to our future. And, as we turn this corner, we can turn more of our collective energies to more effectively address the far more difficult challenges of habitat degradation and international illegal fishing practices that are undermining the health and abundance of our global ocean resources. The success of the Magnuson Act and the visions of its architects have placed us on solid ground for this continuing journey. But we need to continue to work together to get there.

Eric C. Schwaab

Tsunami Speeds 'Terminal Decline' of Japan's Fish Industry

April 25 (Bloomberg) — The wreckage of a 379-metric ton tuna boat blocks the road to the deserted fish market in Kesennuma, once Japan's largest port for bonito and swordfish. Even after the debris from last month's tsunami has been cleared away, the industry may never recover. "Thirty years ago we used to think Japan was the number one fishing country in the world, with the best catching and processing methods, but that's really no longer the case," Ryosuke Sato, chairman of the Kesennuma Fisheries Cooperative Association, said in an interview in the town, 400 kilometers (250 miles) north of Tokyo. "We've been in terminal decline." Traffic at the port had dropped by 90 percent over the last 20 years as seafood imports rose, even before the country's northeastern coast was devastated on March 11. Destruction of boats, harbors and processing plants, coupled with fears of radioactive contamination in marine life, threatens to hasten Japan's turn to overseas for its most important food staple after rice. Japanese eat more fish per capita than any other developed country, consuming 56.7 kilograms (128 pounds) annually, compared with a global average of 17.1 kilograms, according to the United Nation's Food and Agriculture Organization. Fish accounts for 23 percent of protein in the daily Japanese diet, compared with four percent in the U.S.

Fish Broth

Consumption begins with breakfast in Japan, an archipelago of nearly 7,000 islands, where a traditional morning meal consists of rice and grilled fish. In addition to sushi, staples including miso soup also contain fish broth. To feed the habit, Japan is the world's largest importer of fish, buying $14.4 billion worth in 2008, according to data from the United Nations Food and Agricultural Organization. "We're the biggest fish lovers among the major industrial nations and the number one consumer," said Masayuki Komatsu, a professor at Tokyo's National Graduate Institute for Policy Studies specializing in ocean and marine resources. "It's like water and air to us." Auctions at Tokyo's Tsukiji, the world's largest fish market that stretches over an area the size of 43 football fields, influences prices all over the world, according to Sasha Issenberg, author of 'The Sushi Economy.' "It's like a combination of Wall Street and Sotheby's in the art market and a commodities trading floor," he said.

Five Years

Last month's earthquake and tsunami, which left almost 28,000 dead or missing, disproportionately affected Japan's northeastern fishing ports and towns. In Iwate prefecture, the tsunami caused about 106.6 billion yen ($1.3 billion) of damage to the fishing industry, according to data from the government. That's about ten times the combined total for the prefecture's agriculture and forestry industries. Fishermen in Kesennuma, which has a population of 73,000, expect it to take as long as five years to rebuild the port and market, central to a fishing industry that provides 85 percent of the town's jobs. The city government says 837 townspeople died and 1,196 were listed as missing as of April 22. A further 5,838 people, or 7.8 percent of the population, are in evacuation centers. In addition to the destruction of maintenance and refueling facilities, about 40 fishing vessels were lost, the cooperative's Sato said.

Not Alone

"There's so much damage, this is a crisis for the town and the fishing industry," said the 69-year old Sato, whose Kanedai Co. fish company has sales of 9.4 billion yen in Japan and China, with 230 employees. A poster on the wall signed by wholesalers and customers reads: "You're not alone, everyone is with you. Thank you always for the delicious fish." South Kesennuma, where most of the fish processing plants were located, was the first area to be hit by the tsunami after it passed the island of Oshima that creates the entrance to Kesennuma's harbor about two kilometers off shore. In the harbor, trawlers and a refueling tank were slammed together, spewing fuel. Fire spread across the fuel-water mix, creating an inferno. The 50-meter-long Myojin Maru No.3, licensed to catch yellowfin and albacore tuna in the Indian Ocean, is one of at least 10 giant vessels dumped around the town. It towers over gutted two-storey buildings owned by fishing companies about 500 meters from the fish market. "Companies may have the money to rebuild but people are saying they don't want to come back," Yaeko Komatsu, 53, said as she gazed at the rubble of her seafood company employer she didn't identify. "They say it's dangerous."

Planned Reopening

The fish market is planning to partially re-open in June to provide a sales floor for the expected arrival of bonito boats. Longer-term plans depend on the amount of central government assistance, the cooperative's Sato said. Reconstruction needs to happen fast to prevent workers from leaving the town for good, Itsunori Onodera, a Diet Member representing Kesennuma, said in an interview at the city hall.

Like many ports in Japan, Kesennuma developed a reputation for handling specific kinds of fish. Ships from all over Japan came to the town to sell saury, sharks and tuna. By adding maintenance and refueling facilities, Kesennuma became one of Japan's 10 largest fishing ports, Sato said. The importance of fishing and towns like Kesennuma in Japanese culture belies the fishing industry's declining status in the economy. Fishing contributes about 0.2 percent of Japan's GDP, and the number of fishermen has dropped to about 200,000 from about a million after World War II, according to the National Graduate Institute's Komatsu, also a former official at Japan's Fisheries Agency.

Indonesian Workers

For fishermen like Tokio Takatsuka, who returned to Shiogama Port, 315 kilometers north of Tokyo and 80 kilometers south of Kesennuma, earlier this month to sell yellowfin tuna from the Pacific, that means hiring more crew members from the Philippines and Indonesia to make up for the shortage of Japanese applicants. They come as part of a government plan to ease labor shortages, and signs at the port are now written in Bahasa as well as Japanese. "My generation never considered doing anything besides fishing," Takatsuka, 62, said in an interview last week next to his boat. "It's different for young people now." Even as the government hurries to rebuild facilities, fishermen and consumers are worried about radiation from Tokyo Electric Co.'s Fukushima Dai-Ichi nuclear power plant, Akira Sato, mayor of Shiogama, said in an interview after the town's first fresh tuna auction since the March 11 earthquake. The fisherman Takatsuka sailed more than 60 kilometers wide of the plant on the way to the port, rather than hugging the coast, in order to reassure buyers. About 520,000 liters of water with a level of radioactivity that was 20,000 times the legal limit leaked into the ocean between April 1 and 6, Junichi Matsumoto , a Tepco general manager, said last week.

People Are Spooked

"It puts a cloud over the entire fishing industry and Japan's food culture is suffering as a result," Jeff Kingston, director of the Department of Asian Studies at Temple University's Japan campus said. "People are spooked." The level of radioactivity in water leaked from the No. 2 reactor of the Fukushima Dai-Ichi nuclear plant was 20,000 times the regulatory limit, Tepco said on April 21. A total of 520 tons of contaminated water leaked between April 1 and April 6, said Junichi Matsumoto, a general manager at the utility. At Tokyo's Tsukiji fish market, sales of fresh fish fell to an average 583 metric tons per day in the week ended March 17, down 28 percent from a year earlier. The following week they dropped by 44 percent. "If this continues for two or three years we don't know what will happen to our bodies from consuming contaminated fish," Yasuo Kawada, a 59-year-old manufacturing employee said in an interview. "I do worry."

Fish Bans

Radiation from fish and lobsters near the U.K.'s biggest nuclear polluter suggest radioactive material dumped into the sea from Tepco's Fukushima power plant isn't a long-term health threat, according to Richard Wakeford, a professor of epidemiology at the University of Manchester's Dalton Nuclear Institute. The Sellafield nuclear-processing plant in northwest England has discharged at least 320,000 times more radioactive material into the Irish Sea since 1952 than what Tepco released from Fukushima this month, according to Bloomberg calculations based on data from both sites. Still, average radiation doses by seafood-consumers near Sellafield over 15 years have been half the recommended limit, studies show. That hasn't stopped

China, Korea, Taiwan and Hong Kong from banning fish imports from parts of Japan. The countries accounted for about 70 percent of Japan's fish exports in 2009, according to Japan External Trade Organization figures. "Radiation is a grim reaper, you can't see it and you can't smell it," said Ken Banwell who has worked as a fish importer in Tokyo for 22 years. "I would say it would have a profound effect on sales from those areas." Still, overall sales at Tsukiji recovered to pre-quake levels last week, indicating Japanese consumers are returning to fish. Prime Minister Naoto Kan proposed a 4-trillion yen ($49 billion) extra budget that is likely to be the first of several packages to rebuild areas devastated by last month's record earthquake and tsunami, which will include assistance for the industry, the government said in an April 22 statement. "It'll take three years, at most five years to rebuild the fish market," said Sato, in his ninth year as head of the Kesennuma Fisheries Association. "In the meantime we need to know how we can continue to live here today, tomorrow, without jobs at plants which don't exist anymore."

Bloomberg Business Report

Drifters Could Monitor Ocean Radiation From Japan

The ocean-going floats would track radioactive material as it approaches Hawaii and the U.S. West Coast. Marine scientists say they are concerned about radiation spewing from the crippled Japanese nuclear plant even though they expect it will take at least two years for radioactive material to reach Hawaii, perhaps three to hit the West Coast. They want to drop a fleet of 60 ocean-going drifters into the debris field as a kind of early-warning system to get a better idea of how much radiation has entered the Pacific Ocean and where it's going. "Currently, we are blind," said Nikolai Maximenko, a physical oceanographer at the University of Hawaii's International Pacific Research Center. "We do not even know where the main plume of floating debris and all those houses (from the Japanese coast) are. We are pulling together an emergency project to put drifters into those patches of floating debris to know where they are."

Maximenko and colleagues at several U.S. institutions say they need to act quickly and are proposing to drop the drifters next month from C-130 aircraft operated by the U.S. Coast Guard and Japanese research ship later this summer. The researchers say that satellite tracking won't work because the pieces of debris on the surface are too small, and that using existing models of Pacific Ocean circulation won't give an accurate enough picture of where the plume is headed.

In addition to warning communities across the Pacific, the project would help make better short-term predictions for people living along the Japanese coast, according to Luca Centurioni, physical oceanographer at the Scripps Institution of Oceanography in La Jolla, Calif., and co-principal investigator on the project. "The general ocean circulation generally well understood, but if you want to make a shorter prediction, you need models to help you out," Centurioni said.

The proposal would extend the reach of the Global Drifter Program, which has some 900 instruments taking a variety of measurements across the world's oceans. Japanese scientists are sampling the coastal waters for radioactive nucleides that could pose a danger to humans and the marine ecosystem. Even though the plant isn't discharging cooling water from the plant's damaged reactors, radiation is still entering the ocean, says Ken Buesseler, a marine chemist at the Woods Hole Oceanographic Institute. "We know there are still discharges there may be a delayed release even if they plug every hole," Buesseler told Discovery News from his office at Woods Hole, Mass. "I see no evidence from the Japanese data that releases have decreased."

A quarter-century ago, Buesseler studied radioactive releases from the Chernobyl nuclear plant in Ukraine, and found that radiation was carried by winds and rain into the Black Sea, several hundred miles away. The levels of radiation along the Japanese coast are much higher, he said. Buesseler says there are still many unanswered questions about radiation levels in the ocean. "What we don't know is if that's the main source or there were explosions or releases to the atmosphere," Buesseler said. "They also don't know how far north and south and further into the ocean or how much has gone up."

Buesseler said Japanese officials are providing data for three radioactive particles: iodine 131 (which decays rapidly has an eight-day half-life) cesium 134 (two-year half-life) and cesium 137 (30 year half-life). Buesseler notes that there are other kinds of radioactive particles produced by nuclear plants that are not being monitored. "We don't know about plutonium," he said. "No one has taken that on in Japan."

Debris from the nuclear plant is expected to contain long-living radioactive objects, as well as industrial toxins, researchers say. Still, most of the radioactive particles from the plant that make their way directly into the ocean will become less concentrated over time — like a drop of colored dye in a bathtub. "If you take a volume of water across the Pacific Ocean, with the vertical and horizontal dispersion it's going to be mixed up and diluted so by the time it travels across the pacific you don't expect high concentrations," Centurioni explained. Less well-known, however, is the fate of contaminated debris, he added.

The U.S. Environmental Protection Agency says the amount of radiation reaching U.S. shores through the air currents, rain or ocean water will be so small that it will be tough to detect, and less than the amount that people receive from the sun's cosmic rays or other natural background sources. The National Oceanic and Atmospheric Administration does have a marine debris tracking program and will be coordinating sightings of the debris patch from ships crossing the Pacific. After hitting the West Coast in three years or so, oceanographers say the debris from Japan is expected to enter a swirling gyre of water known as the "Great Pacific Garbage Patch." The patch has been known about for several years, and occasionally dumps plastic, running shoes and other flotsam onto beaches in Hawaii and the Northwest coast.

By Eric Niiler, Discovery.com

Critical Infrastructure for Ocean Research and Societal Needs in 2030

National Research Council

The United States has jurisdiction over 3.4 million square miles of ocean in its exclusive economic zone, a size exceeding the combined land area of the 50 states. This expansive marine area represents a prime national domain for activities such as maritime transportation, national security, energy and mineral extraction, fisheries and aquaculture, and tourism and recreation. However, it also carries with it the threat of damaging tsunamis and hurricanes, industrial accidents, and outbreaks of waterborne pathogens. The 2010 Gulf of Mexico *Deepwater Horizon* oil spill and the 2011 Japanese earthquake and tsunami are vivid reminders that ocean activities and processes have direct human implications both nationally and worldwide, understanding of the ocean system is still incomplete, and ocean research infrastructure is needed to support both fundamental research and societal priorities.

In 2004, the U.S. Commission on Ocean Policy report, *An Ocean Blueprint for the 21st Century*, called for "a renewed commitment to ocean science and technology" to realize the benefits of the ocean while ensuring its sustainability for future generations. Since the release of the Commission's report, federal agencies have been working together through the National Science and Technology Council's Subcommittee on Ocean Science and Technology (SOST), which has the mandate to identify research priorities, facilitate coordination of ocean research, and develop ocean technology and infrastructure. This study was initiated to assist SOST in planning for the nation's ocean research infrastructure needs in 2030 by identifying major research questions anticipated to be at the forefront of ocean science in 2030, defining categories of infrastructure that should be included in next-generation planning, providing advice on criteria that could be used to set priorities for asset development or replacement, recommending ways in which the federal agencies could maximize the value of ocean infrastructure investments, and addressing societal issues. It is also intended to complement efforts in support of the National Ocean Council, which was established to implement the National Ocean Policy outlined in the *Final Recommendations of the Interagency Ocean Policy Task Force* (Executive Order 13547, July 19, 2010).

Ocean research infrastructure supports both fundamental and applied scientific research that addresses urgent societal concerns such as climate change, human health, domestic offshore energy production, national security, marine shipping, tsunami detection and severe storm tracking, sustainable fisheries and aquaculture growth, and changes in marine ecosystem services. However, significant components of national infrastructure are aged, obsolete, or insufficient to meet growing societal demand for scientific information to enable safe, efficient, and environmentally sustainable use of the ocean. A comprehensive range of ocean research infrastructure will be needed to overcome these challenges, and more interdisciplinary and multidisciplinary research will require a growing suite of infrastructure. Current institutional barriers have inhibited collaborative efforts among federal agencies to plan for the operation and maintenance of major, high-cost, critical infrastructure assets such as ships, satellites, and global observing systems.

Recommendation: Federal ocean agencies should establish and maintain a coordinated national strategic plan for critical shared ocean infrastructure investment, maintenance, and retirement. Such a plan should focus on trends in scientific needs and advances in technology, while taking into consideration life-cycle costs, efficient use, surge capacity for unforeseen events, and new opportunities or national needs. The plan should be based upon a set of known priorities and updated through periodic reviews.

Setting Priorities and Maximizing Investments

Prioritization of ocean infrastructure investments involves choosing optimal combinations of assets within certain budget constraints to maximize benefits. The committee devised criteria that could be used to help federal agencies and others develop a prioritization scheme. These criteria encompass a wide range of issues, including whether specific infrastructure can help address multiple scientific questions or needs; data quality and continuity; future technology trends; balance between risk and benefit; and national strategic or economic importance. From an economic viewpoint, this type of prioritization needs to acknowledge uncertainties regarding the ability of future ocean science research to produce information relevant to critical ocean-related societal issues.

Recommendation: Development, maintenance, or replacement of ocean research infrastructure assets should be prioritized based on (1) usefulness for addressing important science questions; (2) affordability, efficiency, and longevity; and (3) ability to contribute to other missions or applications. Such prioritization will maximize societal benefit for the nation.

Federal agencies can optimize investments in ocean research infrastructure by following a number of best practices: effectively and efficiently managing existing resources; providing broad access to data, information, and facilities; fostering collaboration at multiple organizational levels; facilitating the successful transition of infrastructure from research to operational use; and ensuring the next generation of ocean science infrastructure. A coordinated, adaptable, long-term strategy for usage of shared, federally funded infrastructure assets, with possibilities to include locally and state-funded infrastructure, and periodic reviews of ocean infrastructure are needed to fully capitalize on investments made by individual agencies.

Recommendation: National shared ocean research infrastructure should be reviewed on a regular basis (every 5-10 years) for responsiveness to evolving scientific needs, cost effectiveness, data accessibility and quality, timely delivery of services, and ease of use in order to ensure optimal federal investment across a full range of ocean science research and societal needs.

Major Research Questions in 2030

The committee identified four major themes that are of compelling interest to society and that will drive scientific research for the next two decades: enabling stewardship of the environment, protecting life and property, promoting economic vitality, and increasing fundamental scientific understanding. Utilizing strategic planning documents, current literature, and community input, the committee converged upon 32 major research questions that they anticipate will be at the forefront of scientific and societal importance in 2030. The scientific questions that will drive research in 2030 are rich and diverse and are of compelling interest to society. The importance of these questions demands continued investment in ocean research infrastructure. In order to address the most important and societally relevant questions, U.S. ocean research infrastructure will be required to serve a broad set of needs. Many of these questions are presently relevant in 2010 but are not simple issues that will result in solutions with a few more years of intensive effort. Instead, they reflect challenging scientific problems that will likely take decades to solve, especially if only limited resources are available. These include the need for a global observational framework with sustained ability to monitor change in the ocean and enhance prediction of the coupled ocean-atmosphere system, a capability to focus on process studies that improve understanding, a focus on environmentally sensitive regions or areas of national security, and the flexibility to deploy infrastructure during events or emergencies.

Ocean Infrastructure Categories

In this report, U.S. ocean research infrastructure is defined as "the full portfolio of platforms, sensors, data sets and systems, models, supporting personnel, facilities, and enabling organizations that the nation can bring to bear to answer questions about the ocean, and that is (or could be) shared by or accessible to the ocean research community as a whole." The committee focused on ocean research infrastructure that could be considered community-wide or shared assets, in that they are available to the ocean science community as a whole. The wide array of infrastructure assets currently in use and needed for 2030 include mobile and fixed platforms, in situ sensors and sampling, remote sensing and modeling, and data management and communications. In addition, enabling organizations will be necessary to foster technology innovation and to help train the future ocean science workforce.

An examination of trends revealed that, in the past two decades, the use of floats, gliders, remotely operated vehicles, autonomous underwater vehicles, and scientific seafloor cables has increased; the use of ships, drifters, moorings, and towed platforms has remained stable; and the use of human occupied vehicles has declined. Based on these trends and on the major science questions for 2030, it is anticipated that utilization and capabilities for floats, gliders, remotely operated vehicles, autonomous underwater vehicles, submarine scientific cables, and moorings will continue to increase significantly for the next 20 years. Ships will continue to be an essential component of ocean research infrastructure; however, the increasing use of autonomous and unmanned assets will broaden the demands for a wide range of ship capabilities. Many sensor capabilities have increased: longevity, stability, data communications, adaptability, and access to harsh environments. These improvements are mostly dependent on innovations occurring outside the ocean science field, and the oceanographic community will continue to benefit from innovations in sensor and other technologies across many fields.

Recommendation: To ensure that the United States has the capacity in 2030 to undertake and benefit from knowledge and innovations possible with oceanographic research, the nation should implement a comprehensive, long-term research fleet plan to retain access to the sea; Recover U.S. capability to access fully and partially ice-covered seas; Expand abilities for autonomous monitoring at a wide range of spatial and temporal scales with greater sensor and platform capabilities; Enable sustained, continuous time-series measurements; Maintain continuity of satellite remote sensing and communication capabilities for oceanographic data and sustain plans for new satellite platforms, sensors, and communication systems; Support continued innovation in ocean infrastructure development. Of particular note is the need to develop in situ sensors, especially biogeochemical sensors; Engage allied disciplines and diverse fields to leverage technological developments outside oceanography.

Barotrauma Workshop to Help Reduce Bycatch Mortality in Deep Water Recreational Fisheries

A national gathering of recreational anglers, charter operators, sportfishing industry representatives, fishery managers and scientists explored ways to improve the survival of released recreationally caught fish. The Workshop was sponsored by NOAA Fisheries Service in Atlanta, Georgia, March 2011 and was hosted by the Atlantic States Marine Fisheries Commission. The focus of the workshop was on how to reduce pressure related mortality in deep water species such as groupers, snapper and Pacific rockfish. Goals of the workshop included: Identify best practices and equipment; Develop an outline for messages directed at anglers; Provide guidance to fishery management organizations; and Identify gaps in the current state of knowledge in need of additional research efforts.

The workshop attendees developed a wide range of recommendations related to the above goals and these are presented in detail at the FishSmart website at http://www.fishsmart.org/.

Specific recommendations related to reducing bycatch mortality for fish caught in deep water included: 1) Avoidance of depths and areas where fish that are likely to be caught that require recompression is ideal, but not always practical; 2) When not required by law to vent (i.e. Gulf reef fish fishery), recompression is generally the first choice for returning fish to the depth at which they were caught; 3) Fish caught deeper than 30 feet are likely to suffer from barotrauma; 4) Return fish to depth of capture, even returning fish to 60-100 feet can dramatically improve survival; 5) If recompression is not an option, venting is a second option. Note – a fishes stomach may protrude from its mouth – Do not puncture the stomach. 6) The shorter the surface time, the better, surface time is a critical factor in rates of survival and ideally should be less than two minutes; 7) Fish that suffer from barotrauma are at an increased risk of suffering serious injury if they are dropped on deck or otherwise banged around; 8) The kind of fish descender device used in a particular situation should consider the potential for predation (i.e. dolphins in parts of the Gulf of Mexico).

Additional research is needed for dealing with fish that have barotrauma in an effective and efficient manner. Varied mortality rates occur for different species of fish, the same species of fish of different sizes, and fishes of the same species and size but caught in different environmental conditions (i.e. surface and catch depth), etc. Also, gear research, may identify ways to select for fish that will not require recompression. Additional work is also needed to develop more efficient recompression devices and techniques for different conditions and fish. For example, on a small boat where a couple of anglers have a low catch rate of fish to be recompressed, a device that descends one fish at a time may be adequate, but on a large charter vessel with 60 to 90 anglers, a dozen or more fish may need to be recompressed at the same time, requiring a different kind of device.

Marty Golden, NOAA Fisheries Service

Shifting spring: Arctic plankton blooming up to 50 days earlier now

Climate researchers have long warned that the Arctic is particularly vulnerable to global warming. The dramatic shrinking of sea ice in areas circling the North Pole highlights those concerns. A new report finds that the disappearing ice has apparently triggered another dramatic event - one that could disrupt the entire ecosystem of fish, shellfish, birds, and marine mammals that thrive in the harsh northern climate. Each summer, an explosion of tiny ocean-dwelling plants and algae, called phytoplankton, anchors the Arctic food web. But these vital annual blooms of phytoplankton are now peaking up to 50 days earlier than they did just 14 years ago, satellite data show. “The ice is retreating earlier in the Arctic, and the phytoplankton blooms are also starting earlier,” said study leader Mati Kahru, an oceanographer at the Scripps Institution of Oceanography in San Diego.

Drawing on observations from three American and European climate satellites, Kahru and his international team studied worldwide phytoplankton blooms from 1997 through 2009. The satellites can spot the blooms by their color, as billions of the tiny organisms turn huge swaths of the ocean green for a week or two. The blooms peaked earlier and earlier in 11 percent of the areas where Kahru’s team was able to collect good data. Kahru said the impacted zones cover roughly 1 million square kilometers, including portions of the Foxe Basin and the Baffin Sea, which belong to Canada, and the Kara Sea north of Russia.

In the late 1990s, phytoplankton blooms in these areas hit their peak in September, only after a summer’s worth of relative warmth had melted the edges of the polar ice cap. But by 2009 the blooms’ peaks had shifted to early July. “The trend is obvious and significant, and in my mind there is no doubt it is related to the retreat of the ice,” said Kahru, who published the work in the journal Global Change Biology. “A 50-day shift is a big shift,” said plankton researcher Michael Behrenfeld of Oregon State University, who was not involved in the study. “As the planet warms, the threat is that these changes seen closer to land may spread across the entire Arctic.”

Ecologists worry that the early blooms could unravel the region's ecosystem and "lead to crashes of the food web," said William Sydeman, who studies ocean ecology as president of the nonprofit Farallon Institute in Petaluma, Calif. When phytoplankton explode in population during the blooms, tiny animals called zooplankton - which include krill and other small crustaceans - likewise expand in number as they harvest the phytoplankton. Fish, shellfish and whales feed on the zooplankton, seabirds snatch the fish and shellfish, and polar bears and seals subsist on those species.

The timing of this sequential harvest is programmed into the reproductive cycles of many animals, Sydeman said. "It's all about when food is available." So the disrupted phytoplankton blooms could "have cascading effects up the food web all the way to marine mammals." But the Arctic food web is poorly studied, and so any resulting decline in fish, seabirds and mammals will be difficult to spot.

As the Arctic Ocean north becomes less and less icy, commercial fisherman have begun eyeing these vast, untapped waters as an adjunct to the famously rich fishing grounds of the subarctic Bering Sea, west of Alaska. But in 2009, the U.S. body overseeing fishing in the region, the North Pacific Fishery Management Council, banned commercial fishing in the Arctic Ocean, citing a lack of knowledge about how many - or even what kind - of fish live there. "There are no catches authorized because we don't know enough about the fish populations there to set a quota," said Julie Speegle, a spokeswoman for the Alaska office of the National Marine Fisheries Service.

Last week, that service reported results from the first fish survey in 30 years of the Beaufort Sea, an arm of the Arctic Ocean north of Alaska. The survey found sizeable populations of several commercially valuable species, including pollock, Pacific cod, and snow crab.

How these populations will respond to the ever-earlier plankton blooms is a big unknown, Sydeman said. But other research has shown that northern Atlantic cod populations crash when plankton blooms in that region shift in time. Last week, the National Snow and Ice Data Center, in Boulder, Colo., reported that in February, Arctic sea ice covered a smaller area than ever seen in that month, tying with February 2005 as the most ice-free February since satellites began tracking Arctic ice in 1979. The annual average Arctic sea ice coverage has decreased about 12 percent since then, a trend that appears to be accelerating, said Walt Meier, a research scientist at the center. Summer ice coverage has declined even more dramatically, he said, with the Arctic losing almost a third of its late-summer ice over the past 30 years.

Washington Post

New Book
The Tuna/Porpoise Controversy: How Tuna Fishermen were caught in the government's net and fought to survive

By August Felando and Harold Medina, Western Sky Press, San Diego, California

The following is a copy of the back cover of this book: The fishery for tunas in the Pacific Ocean is an extremely important part of the history of California and the nations of the Pacific coast of Latin America. The catches of tunas in the eastern Pacific Ocean have exceeded 600,000 metric tons in some years. This wealth from the sea has stimulated the economies of the nations that participate in the fishery. Thousands of men have been employed as fishermen, and thousands of other people have been employed as cannery workers, shipyard workers, and suppliers of gear, fuel, and food. Also, consumers all over the world have benefited from the availability of a nutritious and low-cost source of protein.

There are many fascinating aspects to the 100-year history of this fishery. Prior to World War II, the catches were much less than they are now. Nearly all of the vessels of that period were registered in the United States. Technical developments during the 1950s made it feasible to fish for tunas with large nets, called purse seines, and by 1963 virtually all of the larger vessels had been converted to purse seiners. The catches increased dramatically, mostly due to offshore expansion of the area in which fishing took place, but so did the problems. Environmentalists were concerned about the fact that the nets were often set around mixed aggregations of tunas and porpoises, and porpoises were sometimes killed in the process. During the 1960s and 1970s, the coastal nations of Latin America increased their involvement in the tuna fishery. Political disagreements among governments occurred on important issues, including coastal State sovereignty over the ocean and its resources and limits on the numbers of vessels permitted to fish, and these issues have not all been resolved.

August Felando and Harold Medina are uniquely qualified to write this book. August Felando was a crew member of two purse-seine vessels during the late 1940s and part-owner of a tuna clipper during the 1950s. He earned a law degree at Loyola Marymount University in Los Angeles in 1954, and was employed as General Manager of the American Tunaboat Association of San Diego for more than 30 years. During that period, he became acquainted with almost every vessel owner and vessel captain in the U.S tuna fleet. His duties also required working with representatives of other segments of the tuna industry, and with state, federal, and international government officials. Harold Medina is an exceptionally skillful tuna fisherman. He

became captain of a tuna clipper in 1948, when he was only 21 years old. In 1960, he converted that vessel to purse seining when technical developments made use of that fishing gear feasible. Thereafter, he became closely involved throughout most of his career in the design of purse-seine vessels and nets. During early 1971, he designed and tested a panel of small-mesh netting that eventually became known as the "Medina Panel." This innovation, which greatly reduced the mortality of porpoises in the net, was quickly adopted by the entire fleet.

Guillermo A. Compeán, Director, Inter-American Tropical Tuna Commission

Congress reduces funds for new catch share programs

Certain commercial fishing organisations say the government has come up with an "Anti-Fishermen Act." But the act - which reduces the amount of funding for the new catch share programmes under the authority of the South Atlantic, Mid-Atlantic, New England, or Gulf of Mexico Fishery Management Council - also has its supporters. Introduced by Representative Walter Jones of North Carolina, the amendment is part of the FY2011 budget that President Barack Obama signed into law last week. Supporters include Saving Seafood, Southern Shrimp Alliance (SSA), Commercial Fishermen of America and the Southeast Fisheries Association. Jones' amendment rejects a National Marine Fisheries Service (NMFS) proposal to inject USD 36 million toward new catch share programmes, which would have imposed more quotas on the amount of fish each fisher can catch annually. While some environmentalists argue catch shares help prevent overfishing, Jones believes they are injurious to fishing communities, reports *The Daily Caller*.

It has been "blocking access to fish for thousands of smaller scale fishermen, destroying their livelihoods and our coastal and fishing communities," asserted Executive Director of Food & Water Watch Wenonah Hauter, reports *North Coast*. But the Gulf of Mexico Reef Fish Shareholders' Alliance, the Gulf Fishermen's Association and the South Atlantic Fishermen's Association, among other groups, differ. They claim the act, formerly known as the Jones Amendment, curtails opportunities for fishers and forces the acceptance of traditional fishery management practices known to benefit few and deplete fisheries.

Gulf of Mexico Reef Fish Shareholders' Alliance Executive Director TJ Tate said federal funds will still be used for existing catch share programmes, just not new ones, but that this will not save taxpayers any money. Instead, the act could cost money in the long term by harming fisheries. "The place to decide on catch shares is in the regional fishery management councils with local fisherman input," she insisted. "The Gulf of Mexico red snapper catch share was approved by 87 per cent of fishermen and the value of the fishery has risen by 86 per cent in five years."

Evidence abounds that catch shares work, according to the Gulf of Mexico Reef Fish Shareholders' Alliance: The Gulf's commercial red snapper catch share enforced starting in 2007 has expanded fishing time from 52 to 365 days and the value of the fishery has since soared by 86 per cent; Alaska's commercial halibut and sablefish catch share implemented in 1995 increased fishing time from 2 to 245 days and the price earned for fish has jumped by 12 per cent; The New England groundfish sectors catch share programme implemented last year increased overall revenue for fishers by 10 per cent in the first eight months versus the same period in 2009.

FIS.com

Omega-3 may up aggressive prostate cancer

High levels of omega-3 in the blood — which is good for the heart — may boost the risk of aggressive prostate cancer in men, U.S. researchers found. Theodore M. Brasky and colleagues at the Fred Hutchinson Cancer Research Center in Seattle analyzed data from a nationwide study involving more than 3,400 men. Half developed prostate cancer during the course of the study and half did not.

The study, published in the American Journal of Epidemiology, found men with the highest blood percentages of docosahexaenoic acid, or DHA — an inflammation-lowering omega-3 fatty acid commonly found in fatty fish such as salmon — have two-and-a-half-times the risk of developing aggressive, high-grade prostate cancer compared to men with the lowest DHA levels. In addition, the study found men with the highest blood ratios of trans-fatty acids — linked to inflammation and heart disease and abundant in processed foods that contain partially hydrogenated vegetable oil — had a 50 percent reduction in the risk of high-grade prostate cancer. Neither fat was associated with the risk of low-grade prostate cancer risk. "We were stunned to see these results and we spent a lot of time making sure the analyses were correct," Brasky said in a statement. "Our findings turn what we know — or rather what we think we know — about diet, inflammation and the development of prostate cancer on its head." However, overall, the beneficial effects of eating fish to prevent heart disease outweigh any harm related to prostate cancer risk, Brasky adds.

UPI.com

Let Us Eat Fish

By Ray Hilborn

This Lent, many ecologically conscious Americans might feel a twinge of guilt as they dig into the fish on their Friday dinner plates. They shouldn't.

Over the last decade the public has been bombarded by apocalyptic predictions about the future of fish stocks — in 2006, for instance, an article in the journal Science projected that all fish stocks could be gone by 2048.

Subsequent research, including a paper I co-wrote in Science in 2009 with Boris Worm, the lead author of the 2006 paper, has shown that such warnings were exaggerated. Much of the earlier research pointed to declines in catches and concluded that therefore fish stocks must be in trouble. But there is little correlation between how many fish are caught and how many actually exist; over the past decade, for example, fish catches in the United States have dropped because regulators have lowered the allowable catch. On average, fish stocks worldwide appear to be stable, and in the United States they are rebuilding, in many cases at a rapid rate.

The overall record of American fisheries management since the mid-1990s is one of improvement, not of decline. Perhaps the most spectacular recovery is that of bottom fish in New England, especially haddock and redfish; their abundance has grown sixfold from 1994 to 2007. Few if any fish species in the United States are now being harvested at too high a rate, and only 24 percent remain below their desired abundance.

Much of the success is a result of the Magnuson Fishery Conservation and Management Act, which was signed into law 35 years ago this week. It banned foreign fishing within 200 miles of the United States shoreline and established a system of management councils to regulate federal fisheries. In the past 15 years, those councils, along with federal and state agencies, nonprofit organizations and commercial and sport fishing groups, have helped assure the sustainability of the nation's fishing stocks.

Some experts, like Daniel Pauly of the University of British Columbia Fisheries Center, who warns of "the end of fish," fault the systems used to regulate fisheries worldwide. But that condemnation is too sweeping, and his prescription — closing much of the world's oceans to fishing — would leave people hungry unnecessarily.

Many of the species that are fished too much worldwide fall into two categories: highly migratory species that are subject to international fishing pressures, and bottom fish — like cod, haddock, flounder and sole — that are caught in "mixed fisheries," where it is impossible to catch one species but not another. We also know little about the sustainability of fish caught in much of Asia and Africa.

The Atlantic bluefin tuna is emblematic of the endangered migratory species; its numbers are well below the target set by the International Commission for the Conservation of Atlantic Tunas, and the catches in the Eastern Atlantic are too high. Many species of sharks also fall into this category. Because these stocks are fished by international fleets, reducing the catch requires global cooperation and American leadership. But not all highly migratory fish are in danger; the albacore, skipjack and yellowfin tuna and swordfish on American menus are not threatened.

Managing the mixed fisheries in American waters requires different tactics. On the West Coast, fish stocks have been strongly revived over the past decade through conservative management: fleet size reductions, highly restrictive catch limits and the closing of large areas to certain kinds of nets, hooks and traps. Rebuilding, however, has come at a cost: to prevent overharvesting and protect weak species, about 30 percent of the potential sustainable harvest from productive species (those that can be harvested at higher rates) goes untapped.

A similar tradeoff is going on in New England, where the management council, made up of federal and state representatives, restricts the harvesting of bottom fish like cod and yellowtail flounder in both the Gulf of Maine and Georges Bank, off Cape Cod. In trying to rebuild the cod, regulators have had to limit the catch of the much more abundant haddock, which are caught in the same nets.

The Magnuson Act regulating federal fisheries has been successful, but it needs to be revised. The last time it was reauthorized, in 2006, it required the rebuilding of overfished stocks within 10 years. That rule is too inflexible and hurts fishing communities from New England to California. A better option is to give the management councils greater discretion in setting targets and deadlines for rebuilding fish stocks.

We are caught between the desire for oceans as pristine ecosystems and the desire for sustainable seafood. Are we willing to accept some depleted species to increase long-term sustainable food production in return? After all, if fish are off the menu, we will likely eat more beef, chicken and pork. And the environmental costs of producing more livestock are much higher than accepting fewer fish in the ocean: lost habitat, the need for ever more water, pesticides, fertilizer and antibiotics, chemical runoff and "dead zones" in the world's seas.

Suddenly, that tasty, healthful and environmentally friendly fish on the plate looks a lot more appetizing.

From the New York Times

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