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Advance Fisheries Technology

www.seafdec.or.th Training Department

FISHERIES BY-CATCH

Many fishing operations catch fishes other than those that are being targeted, and in many cases these are simply thrown overboard and left to die in the sea. In some shrimp trawl fisheries, the discard could be 90% of the catch. Other fishing operations also kill seabirds, turtles and dolphins, sometimes in huge numbers.

(continue on page 2)

FEATURE STORY

INSIDE THIS ISSUE

Inception Workshop on Bycatch Management and Reduction of Discards in Trawl Fisheries

The FAO/GEF Inception Workshop on Bycatch Management and Reduction of Discards in Trawl Fisheries was organized at the Training Department of the Southeast Asian Fisheries Development Center (SEAFDEC) in Samut Prakarn, Thailand from 3 to 6 November 2009. The FAO/UNEP/GEF Project on Reduction of Environmental Impact from Tropical Shrimp Trawling through the Introduction of Bycatch Reduction Technologies and Change of Management (REBYC I) was implemented from 2002 to 2003 with the Philippines and Indonesia as the participating countries and SEAFDEC serving as the project's collaborating partner. The objectives and expected outputs of the Workshop will follow-up project on Bycatch Management and Reduction of Discards in Trawl Fisheries (REBYC II).

Estimates vary as to how serious the problem on by-catch is, but latest reports suggest that around eight percent of the total global catch is discarded, although previous estimates indicated around a quarter might be thrown overboard. Simply no-one knows how much discards or by-catch is really produced from fishing operations.

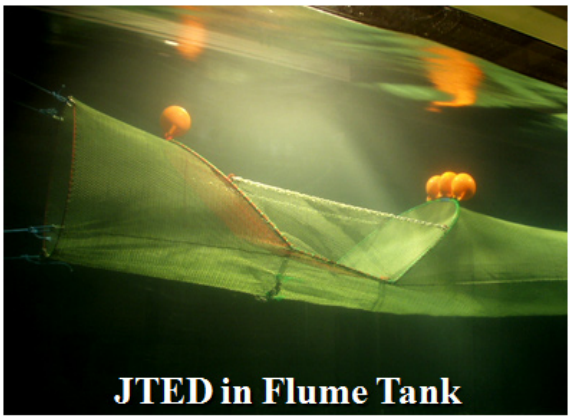
Incidental capture or by-catch of mammals, sea-birds, turtles, sharks and numerous other species is recognized as a major problem in many parts of the world. By-catch could include non-target species as well as targeted fish species that could not be landed because they are for instance, undersized. In short, anywhere between 6.8 million and 27 million metric tons of fish could be discarded each year, reflecting certain huge uncertainties in the data on this important issue.

With such large scale data on fish mortality, by-catch in some fisheries could therefore affect the structure and function of the marine ecosystem in terms of population, community and the environment in general. Thus, by-catch production has become one of the most widely recognized and serious environmental impacts of modern commercial fisheries.

Source: http://www.greenpeace.org/international/campaigns/oceans/bycatch

สัตว์น้ำที่จับโดยไม่ได้ตั้งใจ (Bycatch) เป็นสัตว์น้ำที่ไม่ใช่กลุ่มเป้าหมายที่ได้จากการจับโดยเครื่องมือประมงบางชนิด เช่นอวนลาก เบ็ดราว สัตว์ที่ติดมากกับการประมงชนิดนี้ เป็นสัตว์ที่มีความเสี่ยงต่อการสูญพันธุ์ เช่น เต่าทะเล นกทะเล เป็นต้น จากสถิติที่ผ่านมา สัตว์น้ำที่ใกล้จะสูญพันธุ์เหล่านี้ ถูกจับแบบไม่ได้ตั้งใจ/ต้องการเป็นจำนวนมาก ทำให้อัตราการตายเพิ่มขึ้นอย่างรวดเร็ว มีหลายหน่วยงานเป็นห่วงถึงอนาคตของสัตว์น้ำเหล่านี้จึงได้พยายามหาวิธีและอุปกรณ์ช่วยเพื่อลดการจับสัตว์น้ำเหล่านี้ขึ้นมา

IMPLEMENTATION OF JTEDs IN SOUTHEAST ASIA



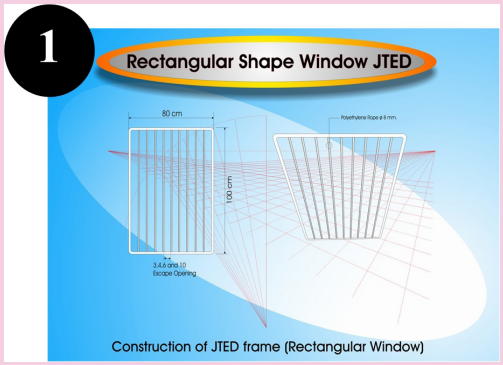
The incidental catch of juveniles and trash fish is an acknowledged adjunct to fisheries management. Its recent development into a major fisheries management issue can be attributed to the increasing demand for fish and fishery products as well as to the growing recognition of the need to ensure that fisheries are conducted in a sustainable manner.

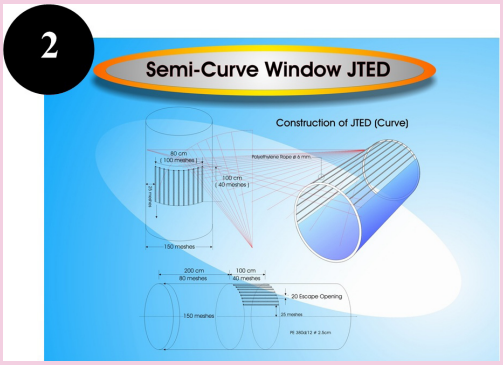
Once considered mostly as a nuisance, the catch of juveniles and trash fish is now being recognized to have detrimental impacts on the fecundity of the fisheries resources. Similarly, the economic value of the catch of juveniles of commercially important fish species has now been viewed as being considerably lower than those for the same species at sizes more suited to the market.

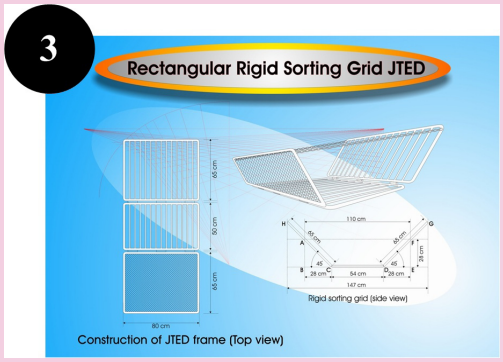
In the development of sustainable fisheries, reducing the incidental catch of juveniles and trash fish is a key priority. In response to this, the Training Department (TD) of the Southeast Asian Fisheries Development Center (SEAFDEC) initiated in 1998 a number of research and development activities aimed at providing the technical foundation for the adoption of Juvenile and Trash Excluder Devices (JTEDs) in trawl fisheries in the Southeast East Asian region. In fishing technology, JTEDs have been developed with the main purpose of selectively harvesting the target catch while at the same time reducing the level of unwanted catch in the form of juveniles, immature fish and trash fish. Furthermore, JTEDs are generally placed in the cod-end area of a trawl net.

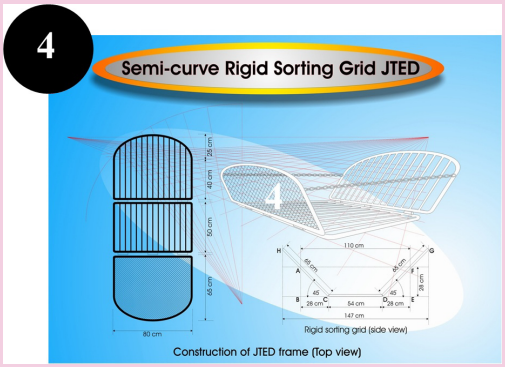
JTED Designs

Currently there are 4 types of JTEDs being promoted by SEAFDEC/TD, namely:









JTED experiments and demonstration trials have been implemented by SEAFDEC/TD in collaboration with SEAFDEC Member Countries such as Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Vietnam and Thailand,. The results showed that the specific type of device must be chosen to suit both the target species and the fishing grounds where the fishing operations are being carried out. There is however, an obvious limitation when there are two or more target species and the commercial sizes are different. Such situation could cause certain problems in selecting the correct and appropriate bar spacing.

การส่งเสริมเครื่องมือแยกสัตว์น้ำวัยอ่อนในภูมิภาคเอเชียตะวันออกเฉียงใต้

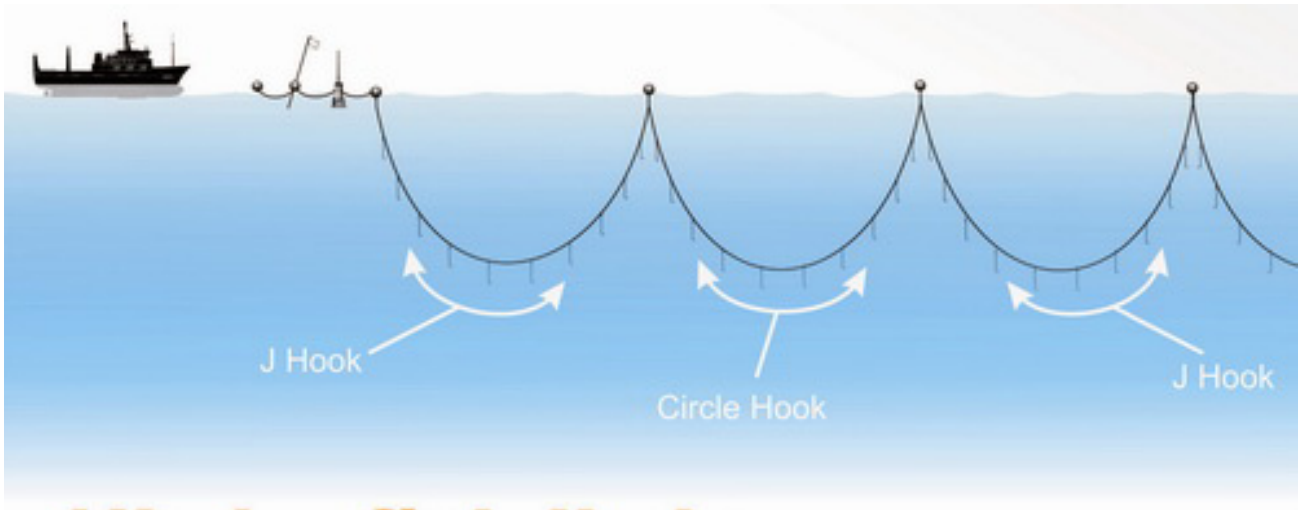
เนื่องจากการทำประมงอวนลาก เป็นการทำประมงที่สามารถจับสัตว์น้ำได้ทุกขนาด รวมทั้งสัตว์น้ำวัยอ่อนซึ่งยังไม่สามารถเจริญพันธุ์ได้และมีมูลค่าทางเศรษฐกิจต่ำ ทำให้ส่งผลถึงการสูญเสียของสัตว์น้ำในอนาคต ศูนย์พัฒนาการประมงแห่งเอเชียตะวันออกเฉียงใต้ จึงได้ทำการทดลองและประดิษฐ์เครื่องแยกสัตว์น้ำวัยอ่อนสำหรับการทำประมงอวนลากขึ้นและทำการส่งเสริม เผยแพร่ให้กับประเทศสมาชิกในภูมิภาคเอเชียตะวันออกเฉียงใต้ เพื่อความยั่งยืนของสัตว์น้ำในอนาคต การพัฒนาและออกแบบเครื่องมือแยกสัตว์น้ำวัยอ่อนมีทั้งหมด 4 แบบได้แก่ 1) Rectangular Shape Window JTED, 2) Semi-curved Window JTED, 3) Rigid Sorting grid JTED และ 4) Semi-curved Rigid Sorting grid JTED

A VEHICLE TOWARDS SUSTAINABLE LONG-LINE FISHERIES

Since August 2002, a campaign, led by protectionist groups has been going on in the United States to raise public concern on the impacts of pelagic long-line fisheries on sea turtles. Their strategy includes making appeals at various international forums and the mass media, while involving the UN is also one of their strategies. Through a UN resolution, such undertaking was previously made successful with the global moratorium of drift net fishing. To avoid the application of the same strategy to other activities in long-line fisheries, many studies were conducted on the use of Circle hooks in pelagic long-line fishery, the results of which have demonstrated that 18/0 circle can significantly reduce sea turtle interactions compared to the industry standard 9/0 J-hooks. In the Southeast Asian region however, the impact of circle hooks on pelagic target species and others are still not clear and the efficiency of circle hook compared with the J-hook is still unknown. Therefore, the SEAFDEC Training Department as a technical agency for the promotion of responsible fishing technologies and practices in the Southeast Asian region, conducted a study on the mitigation of fisheries-sea turtles interactions particularly on the efficiency of the circle hook compared with J-hook in long-line fisheries in the Southeast Asian region. With funding support from the Government of Japan through its Trust Fund Program for Fisheries, related experiments were conducted in collaboration with the Department of Fisheries of Thailand and the Philippines' Bureau of Fisheries and Aquatic Resources. The series of experiments were conducted onboard the SEAFDEC vessels comparing the efficiency of the 18/0 10° offset circle hooks with that of the standard J-hooks in long-line fisheries.

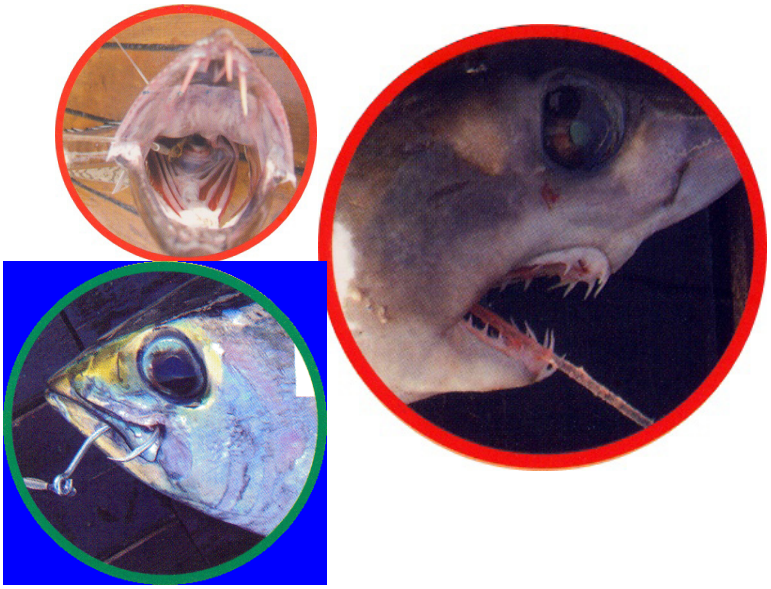
Materials and Methods

SEAFDEC/TD conducted three experiments in different sea areas, namely: the North-eastern Indian Ocean, Andaman Sea Thai waters, and Sulu Sea of the Philippines. Research/training vessels, the M.V. SEAFDEC and the M.V. SEAFDEC 2 were employed for these experiments. A total of 24 research sets were conducted during 3 fishing trips where a total of 13,521 hooks consisting of 18/0 10° offset circle hooks and standard J-hooks were used in long-line fisheries. The number of hooks per one basket was 15-20, and in each set, the circle hooks were set alternately with the J-hooks, basket by basket. Local baits such as chub-mackerel and milkfish were used while hooking positions by all target fishes and by-catch were recorded.

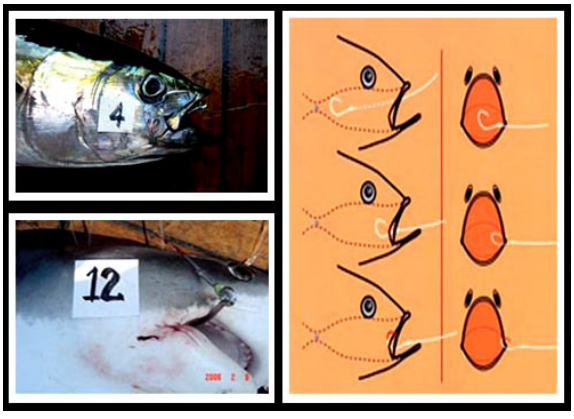


Results

The data from the Temperature-Depth sensors indicated that the hooks were set at depths that ranged from 60 to 300 m, but no sea turtles were caught during the experiments. The results indicated that there was a 3% more tunas and other target species caught by the 18/0 10° offset circle hooks compared to the J-hooks. In contrast, a 22% reduction in terms of total sharks-rays and other non-value by-catch caught by the 18/0 10° offset circle hooks than the J-hooks. The comparison between the hooking positions for the circle hooks and J-hooks. Almost 85.4% of fishes caught were hooked at mouth and only 3.6% of the hooks were found in the digestive system when the circle hooks were used, while there was 24.7% of hooks found in the digestive system for the J-hooks.



การทำประมงเบ็ดราวอย่างยั่งยืน



เนื่องจากการทำประมงเบ็ดราว เป็นการทำประมงชนิดหนึ่งที่ส่งผลกระทบต่อสัตว์น้ำที่ใกล้จะสูญพันธุ์ และไม่ใช่กลุ่มเป้าหมายของการทำประมงชนิดนี้ เช่นเต่าทะเล นกทะเล ฉลาม โลมา เป็นต้น ซึ่งหลายหน่วยงานได้ตระหนักถึงผลกระทบเหล่านี้ จึงได้พยายามคิดค้นและหาวิธีเพื่อแก้ปัญหาดังกล่าว ศูนย์พัฒนาการประมงแห่งเอเชียตะวันออกเฉียงใต้ก็เป็นหน่วยงานหนึ่งในภูมิภาคฯ ที่เล็งเห็นความสำคัญของปัญหานี้ จึงได้ทำการทดลองการทำประมงเบ็ดราว โดยเปรียบเทียบประสิทธิภาพการจับและอัตราการตายจากการจับของสัตว์น้ำที่จับโดยความไม่ได้ตั้งใจ ด้วยเบ็ดรูปตัวเจ และเบ็ดรูปทรงกลม ผลปรากฏว่า เบ็ดรูปทรงกลมมีประสิทธิภาพในการติดจับ หรือเมื่อจับแล้วสามารถรอดตายของเต่าทะเลที่มีประสิทธิภาพมากกว่า เนื่องจาก เบ็ดทรงกลมมีขนาดใหญ่ทำให้เต่าไม่สามารถจะกลืนเขาไปในกระเพาะอาหารได้ ทำให้มีอัตราการรอดตายที่มากกว่า ซึ่งผลจากการทำการทดลองจะทำการเผยแพร่และส่งเสริมต่อประเทศสมาชิกในภูมิภาคต่อไป เพื่อความยั่งยืนในการทำประมงเบ็ดราวในอนาคต

WINNERS OF 2009 INTERNATIONAL SMART GEAR

A team of Australian inventors have won the $30,000 grand prize in the International WWF Smart Gear Competition for a fishing gear innovation that could save thousands of seabirds from dying accidentally on long-lines each year.

Their invention - the underwater baited hook - allows long-line vessels to set baited hooks underwater out of reach of seabirds. Designed for use on coastal tuna and swordfish vessels worldwide, the invention minimizes or eliminates accidental mortality of seabirds including albatrosses, petrels and shearwaters, which are sometimes killed in the fishing gear when they attempt to seize bait attached to long-line hooks. Two other inventions to help reduce by-catch won the runner-up prizes of $10,000 for their inventors. A team from Belgian's Institute for Agricultural and Fisheries Research (ILVO) won for their invention named Hovercran, which substantially reduces by-catch in shrimp trawls.

The other runner-up is David Sterling of Australia's Sterling Trawl Gear Services, who developed a device called the Batwing Board, an alternative to the standard trawl door used by most trawl operators, which both reduces impact to the sea bottom by approximately 90% and reduces fuel consumption.

Source: http://www.smartgear.org

FISHERMEN WILL USE NEW WAYS TO AVOID SNARING ENDANGERED SEABIRDS

Fishing fleets on the high seas of the Atlantic and Pacific from more than 30 countries will now use new ways to avoid accidentally snaring seabirds going after bait on long- lines. The new protections are the focus of strong international measures, promoted by NOAA.

The measures will protect many albatross and seabird species that fly far from land and whose populations are declining faster than most birds around the world, in part due to their incidental catch in fishing long-lines used to catch tuna, swordfish and other tuna-like fishes.

In November 2008, the International Commission for the Conservation of Atlantic Tunas adopted a requirement that the European Commission and 44 other nations should use special gear and techniques to reduce the unintended catch of seabirds. The techniques include fishing at night when few birds are active, weighting fishing lines so the baited hooks sink out of reach of birds, and using devices to scare birds away from the fishing lines. These measures will govern fishing for tuna and tuna-like species in the Atlantic Ocean.

In December 2008, the European Commission and 24 fishing nations that make up the Western and Central Pacific Fisheries Commission set technical specifications for the use of bird-scaring lines and other techniques that help fishermen avoid hooking seabirds by accident. Bird-scaring lines, also called tori lines, are streamers that hang from a line attached at the stern of a fishing vessel. They help prevent birds from reaching the bait when fishing lines are set in the ocean.

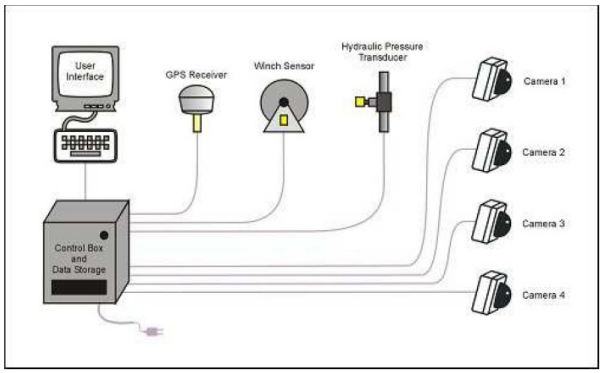
(contunued on page 8)

USING ELECTRONIC MONITORING TO ESTIMATE REEF FISH CATCH ON BOTTOM LONGLINE VESSELS IN THE GULF OF MEXICO

Archipelago Marine Research Ltd. was subcontracted by MRAG to carry out a study to test the feasibility of developing a monitoring system that would use Electronic Monitoring (EM) to satisfy the data needs of the reef longline fishery in the Gulf of Mexico. EM systems consisted of three closed circuit television cameras, a GPS receiver, a hydraulic pressure transducer, a winch rotation sensor, and a system control box. EM systems were placed on six vessels for a total of over 148 days at sea. EM and observer fishing event and catch data were available for comparison for a total of 218 fishing events. EM system at sea data collection on all participating vessels was virtually complete except for data loss occurring when vessel operators manually turned off the EM systems, resulting in 65% overall sensor data completeness. EM sensor data provided accurate vessel position information and enabled identification of setting and hauling events. In terms of catch, both EM and observer methods were numerically within 2.7% of each other and EM detected and speciated two of the three turtles recorded in the observer data. Catch identification comparisons between observer and EM methods were generally good with 80% of catch pairing comparisons having a positive match on a hook-by-hook analysis. Some species showed identification discrepancies between observer and EM, shark species being predominant. These discrepancies were often offset when results from similar species were grouped, usually within the same genus or family. EM was not able to reliably determine catch discarding due to inconsistent catch handling and limitations from camera views. Overall, results of this study suggest that EM shows promise for collecting fishing activity spatial-temporal data and assessing catch composition and further work is needed to determine if the technology could provide reliable catch disposition data.

http://www.nmfs.noaa.gov/by_catch/docs/pria_florida_empilot_oct08.pdf

Example of sensor installations on the study vessel: GPS receiver(left), winch rotation sensor(center), and hydraulic presure sensor(right)



Schematic diagram of the electronic monitoring system, which can record video data from up to four cameras per vessel.

EVENTS CALENDAR

January

18-20: CARES Ping-to-Chart Workshop
Southampton, England
(www.caris.com)

20-21: Coastal Futures 2010
London, England
(www.coastms.com)

20-22: National Conference for Science, Policy and the Environment: The New Green Economy
Washington D.C., USA
(http://ncseonline.org/conference/GeenEconomy)

February

3-5: Retech 2010
Washington, D.C., USA
(www.retech2010.com)

9-11: Underwater intervention 2010
New Orleans, Louisiana, USA
(www.underwaterintervention.com)

22-26: Ocean Sciences Meeting
Portland, Oregon, USA
(www.agu.org)

24-25: IMCA Safety Seminar
Singapore
(www.imca-int.com)

March

1-2: Third Annual Trans-Pacific Maritime Conference
Long Beach, California, USA
(www.joc.com)

9-11: Ocean Careers 2010
London, England
(www.oceancareers.org.uk)

9-11: ONR/MTS Buoy Workshop
Monterey, California, USA
(www.whoi.edu)

13-20: Interdisciplinary Climate Change Research Symposium
Arizona, USA
(www.disccrs.org)

16-18: China Maritime 2010
Hong Kong, China
(www.baridmaritime.com)

17-19: Fifth Vietnam International Exhibition on Ship-building
Hanoi, Vietnam
(www.vietship-exhibition.com)

23-25: Offshore West Africa
Luanda, Angola
(www.offshoreweatafrica.com)

23-25: Deepwater Development 2010
Amsterdam, Netherlands
(www.DD2010.com)

April

27-30: TransRussia 2010
Moscow, Russia
(www.transrussia.ru)

28-29: Water and Environment 2010: CIWEM's Annual Conference
London, England
(www.ciwem.org)

FISHERMEN WILL USE NEW WAYS TO AVOID SNARING ENDANGERED SEABIRDS

(continued from page 7)

The National Oceanic and Atmospheric Administration, an agency of the U.S. Commerce Department, is dedicated to enhancing economic security and national safety through the prediction and research of weather and climate-related events and information service delivery for transportation, and by providing environmental stewardship of our nation's coastal and marine resources. Through the emerging Global Earth Observation System of Systems (GEOSS), NOAA is working with its federal partners, more than 70 countries and the European Commission to develop a global monitoring network that is as integrated as the planet it observes, predicts and protects.

http://www.fakr.noaa.gov/newsreleases/2008/seabirdmeasures2008.pdf

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