



Fish and Shellfish Program NEWSLETTER

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<https://www.epa.gov/fish-tech>

This issue of the Fish and Shellfish Program Newsletter generally focuses on the Gulf of Mexico.

Recent Advisory News

Alabama Department of Public Health issues 2017 Fish Consumption Advisories

The Alabama Department of Public Health (ADPH) annually updates fish consumption advisories based on data collected the preceding fall by the Alabama Department of Environmental Management (ADEM). Updated advisories were issued on July 10, 2017.

ADEM, the Tennessee Valley Authority, and the Alabama Department of Conservation and Natural Resources collected samples of specific fish species for analysis from various waterbodies throughout the state during the fall of 2016 (641 samples; 48 collection stations). ADPH assessed the analytical results to determine whether any of the tested contaminants in the fish may give rise to potential human health effects.

Fish consumption advisories are issued for specific waterbodies and specific species taken from those areas. In reservoirs, advisories apply to waters as far as a boat can be taken upstream in a tributary, that is to “full pool elevations.” “Full Pool elevations” refers to stream embayment waters within a reservoir that may be affected by dynamic flows such as those in the vicinity of hydroelectric dams. The “pulsed” flows in those areas can move waters, debris, and sediment from the mainstem reservoir up the affected streams, essentially creating backward flowing streams.

Newly issued advisories represent the safe number of meals of that species of fish that can be eaten in a given period of time, such as meals per week, meals per month or do not eat any. A meal portion consists of six ounces of cooked fish or eight ounces of raw fish.

The advice contained in this release and complete listings of the posted fish consumption advisories are offered as guidance to individuals who wish to eat fish they catch from various waterbodies throughout the state. No regulations ban the consumption of any of the fish caught within the state, nor is there a risk of an acute toxic episode that could result from consuming any of the fish containing the contaminants for which the state has conducted analyses.

A fish consumption advisory can be issued for one or more specific species of fish within a waterbody or an advisory can be extended to include all fish species within that waterbody. When excess levels of a contaminant are found in a specific species of fish, an advisory is issued for that specific species. For example, if an advisory had been issued for largemouth bass and not for channel catfish, it would be advised that individuals should not eat largemouth bass, but consumption of channel catfish would be permissible without endangering health.

When excess levels of a contaminant are found in multiple fish species sampled from a specific waterbody, a Do Not Eat Any advisory is issued. Consumption of any fish from a specific waterbody under a Do Not Eat Any advisory may place the consumer at risk for harm from the contaminant.

If a species is listed in the advisory, it is prudent to assume that similar species with similar feeding habits should be consumed with caution. For example, if black crappie is listed and white crappie is not, because they are in the same family, all crappie would fall under the listed advisory.

New and updated consumption advisories issued for the 48 bodies of water tested can be found on the ADPH website, <http://www.alabamapublichealth.gov/tox/assets/2017-al-fish-consumption-advisory-final-july-6-2017.pdf>.

For more information, contact John Guarisco, Ph.D. at (800) 338-8374 or John.Guarisco@adph.state.al.us.

Source: <http://www.alabamapublichealth.gov/news/2017/07/10.html>

EPA News

The U.S. Environmental Protection Agency (EPA) is accepting public comments for 60 days on a proposed information collection request (ICR) renewal for EPA's Fish Program (formerly the National Listing of Fish Advisories ICR). EPA began collecting fish advisory and fish tissue information from the states in 1994 and has renewed an ICR for such purposes every three years since then. Under this ICR, EPA intends to gather fish advisory information from states, territories and tribes to provide a national picture of the safety of fish and shellfish, and improve the scientific and policy foundation of EPA's work to support state, territorial, and tribal public health protection actions. States, territories, and tribes are not required to respond to ICR requests as participation is voluntary. The current ICR will expire on July 31, 2018. For more details on the ICR and how to provide written comments, please visit: <https://www.gpo.gov/fdsys/pkg/FR-2018-02-22/pdf/2018-03676.pdf> and Docket ID No. EPA-HQ-OW-2014-0350 at <https://www.regulations.gov/docket?D=EPA-HQ-OW-2014-0350>. Comments must be submitted on or before Monday, April 23, 2018.

Other News

Sea Grant Releases Fact Sheet on Beach, Water, and Seafood Safety after Oil Spill

On December 5, 2017 the Gulf of Mexico Research Initiative (GoMRI) announced a new Sea Grant publication that addresses the public's questions about health safety after the *Deepwater Horizon* incident.

The GoMRI is a 10-year independent research program established to study the effect, and the potential associated impact, of hydrocarbon releases on the environment and public health, as well as to develop improved spill mitigation, oil detection, characterization and remediation technologies. An independent and academic 20-member Research Board makes the funding and research direction decisions to ensure the intellectual quality, effectiveness and academic independence of the GoMRI research. All research data, findings and publications will be made publicly available. The program was established through a \$500 million financial commitment from BP. For more information, visit <http://gulfresearchinitiative.org/>.

The fact sheet, [Is it Safe? Examining Health Risks from the Deepwater Horizon Oil Spill](#), succinctly explains findings from peer-reviewed studies and reports from state and federal agencies that investigated the safety of the beach, water, and seafood since the spill. Multiple government agencies tested more than 22,000 seafood samples for chemicals found in oil and dispersants.

More in-depth information is available in the following Sea Grant publications:

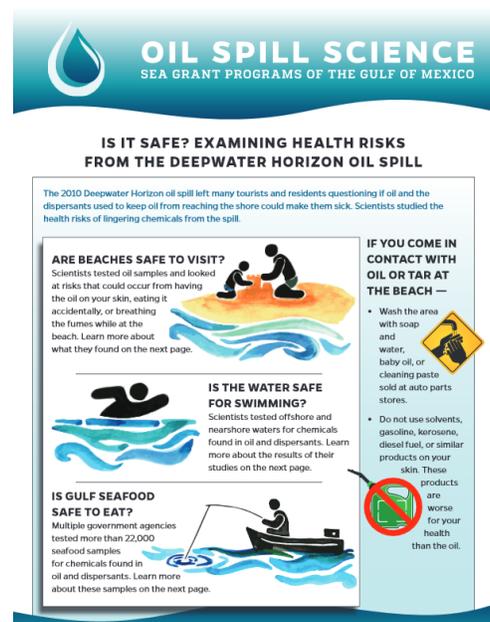
- [Top five frequently asked questions about the Deepwater Horizon oil spill](#)
- [Navigating shifting sands: Oil on our beaches](#)
- [The Deepwater Horizon oil spill's impact on Gulf seafood](#)

The [Sea Grant Oil Spill Outreach Team](#) synthesizes peer-reviewed science for a broad range of general audiences, particularly those who live and work across the Gulf Coast. Sea Grant offers oil spill-related public seminars across the Gulf Coast.

Information about upcoming Sea Grant science seminars and recently held events is [available here](#). To receive email updates about seminars, publications, and the outreach team, [click here](#).

For more information, contact Maggie Dannreuther at maggied@ngi.msstate.edu.

Source: <http://gulfresearchinitiative.org/sea-grant-releases-fact-sheet-beach-water-seafood-safety-oil-spill/>



Screen-capture of *Is it Safe? Examining Health Risks from the Deepwater Horizon Oil Spill* fact sheet (Courtesy of Mississippi-Alabama Sea Grant Consortium)

Marine Researchers Engage Fishing Communities to Improve Trust in Science

On June 2, 2017, the GoMRI reported that trust in scientific findings is especially important when the research relates to your livelihood and health as it did for commercial and recreational fishing communities after the *Deepwater Horizon* oil spill. Many scientists conducting early studies on the spill believed that they were considered trustworthy, like firemen and policemen. However, it became apparent as the spill unfolded that the relationship of the public, science, and trust was complex and sometimes on shaky ground.

“In the weeks and months following the oil spill, the issue of trust came up,” said [Consortium for Oil Spill Exposure Pathways in Coastal River-Dominated Ecosystems \(CONCORDE\)](#) Outreach Coordinator Jessie Kastler. “People who make a living off the sea simply didn’t trust information they were receiving about what was happening to the Gulf and didn’t know who they could trust.”

Scientists and outreach personnel with the CONCORDE group are working to improve their relationship with the public by involving Gulf Coast commercial and recreational fishers in their research as Kastler explained, “We want to tackle that issue by reaching out to the community and being completely transparent about our methods and data.”

The researchers are studying nearshore currents and circulation flows and their potential role in creating sub-surface pathways that influence the movement of sediment, plankton, and other matter such as oil spill material which can affect the habitats and food for fish, shrimp, oysters, and crabs.

The team reached out to local fishers by hosting informational meetings in Mississippi and Louisiana and training sessions at the University of Southern Mississippi Gulf Coast Research Laboratory in 2016 and 2017. Approximately 50 men and women, including Vietnamese (refugees from the Vietnam conflict) and Cajun fishers (descendants from locations such as the Acadia Province, Yugoslavia, and the Canary Islands), attended two or more events.

Prior to these meetings and training sessions, two Vietnamese and Cajun boat captains served as liaisons to their fishing communities and generated interest in the outreach efforts. Thao Vu with the Mississippi Coalition of Vietnamese American Fisher Folks and Families helped the researchers reach out to Vietnamese fishers and provided language interpretation. Vu also helped participants compile questions about coastal science topics important to them including loss of oyster reefs, marine oil snow, water movement, plankton distributions, harmful algal blooms, effects of freshwater flow, fishing regulations, and oil spill impacts.

The participants learned about ongoing research from senior and early-career scientists who shared their specific areas of research, gave overviews of what is currently known, and explained how the research is applicable to fishers’ livelihoods and health. Participants interested in becoming



Participants watch as Jessie Kastler demonstrates how to use a CTD instrument (Photo credit: Maggie Dannreuther, courtesy of the GoMRI)

directly involved with ongoing research received hands-on training in methods and instruments, including the YSI's CastAway and ProDSSII conductivity-temperature-depth (CTD) water samplers, and learned how to consistently record observations.

Participants then used the training they received to collect data while they fished and trawled for shrimp and reported it to the scientists. The researchers, in turn, included the fishers' data in computer models that they are developing for improved predictions of sub-surface water flows. Fisher folk will continue collecting and returning data through the end of the CONCORDE project.

The scientists are benefiting, too, from the engagement efforts. "We want to learn from them," Kastler said. "They've been out on the water for decades and know through experience what is typical for the area." Lessons learned will help the team be more effective in public interactions the next time an event like an oil spill or harmful algal blooms happen.

"We want the public to approach science with a sense of trust," said CONCORDE Director Monty Graham as he explained what they hope to accomplish. "It's unraveling what people think about science and how it can be applied. By getting instruments in their hands and engaging them in our activities, hopefully they will find that science is not mysterious and they can contribute to it."

The Mississippi Coalition of Vietnamese American Fisher Folks and Families and the University of Southern Mississippi are the recipients of a 2017 National Academies of Science [Gulf Research Program Capacity Building Grant](#). Their project will continue efforts to connect scientists with multi-ethnic fishing communities in Mississippi, Louisiana and Alabama to encourage a two-way information exchange.

For more information, contact Jessica Kastler at Jessica.Kastler@usm.edu.

Source: <http://gulfresearchinitiative.org/marine-researchers-engage-fishing-communities-improve-trust-science/>

Recently Awarded Research

NCCOS Awards \$1.7M to Harmful Algal Bloom and Toxins Research

On October 3, 2017, the National Centers for Coastal Ocean Science (NCCOS) announced it awarded \$1.68 million in Fiscal Year 2017 funding for nine research projects to identify conditions increasing bloom toxicity, model toxin movement from water into shellfish, fish, and marine mammals, and improve toxin monitoring and forecasts. These multi-year awards from the NCCOS competitive programs, Ecology and Oceanography of HABs ([ECOHAB](#)) and Prevention, Control, and Mitigation of HABs ([PCM HAB](#)), with a total funding target of \$5.2 million through 2019, will have a national impact.

- The University of Alaska Fairbanks and the Sitka Tribe of Alaska received \$247,000 to uncover the mechanisms behind wintertime occurrences of Paralytic Shellfish Poisoning toxicity in geoduck clam fisheries in Southeast Alaska.

- The University of California Santa Cruz received \$130,000 to investigate interactions between the toxin-producing algal diatom *Pseudo-nitzschia* and marine bacteria in controlling domoic acid biosynthesis and toxic bloom formation.
- The Florida Fish and Wildlife Institute of the Florida Fish and Wildlife Commission received \$90,000 to partner with the U.S. Food and Drug Administration integrating alternate methods of analysis to the classical mouse bioassay into the Neurotoxic Shellfish Poisoning monitoring and management framework.
- The Florida Gulf Coast University and its partners at the University of South Alabama and Dauphin Island Sea Lab, Woods Hole Oceanographic Institution, and University of the Virgin Islands received \$250,000 to study hyper-toxic strains (“super-bugs”) of the ciguatera disease-causing dinoflagellate *Gambierdiscus* and ciguatera toxin fate in coral reef food webs.
- The Bigelow Laboratory for Ocean Sciences and the Maine Department of Marine Resources received \$50,000 to expand options for monitoring diarrhetic shellfish poisoning (DSP) by accelerating regulatory approval of two accurate and rapid screening methods for DSP toxins.
- The University of Maryland received \$166,000 to couple a hydrodynamic-biogeochemical model to a new harmful algal bloom model to predict toxic blooms of *Prorocentrum minimum* and *Karlodinium veneticum* in Chesapeake Bay.
- The Ohio State University and its partners at LimnoTech (Inc.), Michigan Technological University, University of Toledo, Bowling Green State University, and Wayne State University received \$248,000 to link models and field experiments to forecast the potential toxicity of *Microcystis* cyanobacterial blooms in Lake Erie.
- The Virginia Institute of Marine Science (College of William and Mary) received \$250,000 to partner with four other institutions for cross-regional comparisons (Gulf of Mexico, Puget Sound, Long Island Sound and Chesapeake Bay) of the ecology and toxicity of the DSP-causing dinoflagellate *Dinophysis*.
- The Virginia Institute of Marine Science received \$249,000 to study the toxicity and food web impacts of *Alexandrium monilatum* and its toxins in Chesapeake Bay.

The GoMRI is producing a rich legacy of research and technical innovation, with more than 915 peer-reviewed scientific articles and 3,600 scientific conference presentations to date. The proposals funded under Request for Proposals (RFP) VI will contribute further to this growing knowledge base. “The findings from these studies will benefit society by informing new strategies to prevent and mitigate any negative effects of an oil spill in the Gulf of Mexico as well as in other parts of the world,” said Dr. Rita Colwell, Chairman of the GoMRI Research Board. “I am pleased that GoMRI is a leader in efforts to ensure that research data are preserved and made available for the public and future researchers.” This is an important contribution because the GoMRI requires researchers it funds to make all data available to others via its data management system, Gulf of Mexico Research Initiative Information and Data Cooperative. More than 1,500 datasets have been archived and are available for further research. This database continues to increase as research is completed and published. “Because significant science has been accomplished and the GoMRI program will sunset in 2020, RFP VI is focused on integrating existing data and synthesizing research findings,” said Colwell. RFP VI requested proposals addressing: 1) Continuation of previously designated research themes and topics that emerged from prior research; 2) Data integration; 3) Scientific synthesis across themes and consortia; and/or 4) Other overarching scientific and technological products fulfilling the GoMRI scientific legacy. The selected proposals will support science in the five GoMRI thematic areas:

1. Physical distribution, dispersion, and dilution of petroleum (oil and gas), its constituents, and associated contaminants (e.g., dispersants) under the action of physical oceanographic processes, air–sea interactions, and tropical storms.
2. Chemical evolution and biological degradation of the petroleum/dispersant systems and subsequent interaction with coastal, open-ocean, and deep-water ecosystems.
3. Environmental effects of the petroleum/dispersant system on the sea floor, water column, coastal waters, beach sediments, wetlands, marshes, and organisms; and the science of ecosystem recovery.
4. Technology developments for improved response, mitigation, detection, characterization, and remediation associated with oil spills and gas releases.
5. Impact of oil spills on public health including behavioral, socioeconomic, environmental risk assessment, community capacity and other population health considerations and issues.

The following are some of the titles of the available datasets:

- Spatial Genetic Features of Eastern Oysters (*Crassostrea virginica Gmelin*) in the Gulf of Mexico: Northward Movement of a Secondary Contact Zone
- Time-course mRNA sequencing on red drum (*Sciaenops ocellatus*) embryos exposed to slick oil
- Mahi-mahi specific dynamic action (SDA) study
- In vivo cardiac function during swimming in juvenile cobia (*Rachycentron canadum*) following crude oil exposure

- Combined effects of oil exposure, temperature and UV-radiation on buoyancy and oxygen consumption of embryonic mahi-mahi, *Coryphaena hippurus*
- Significant differential gene expression in red drum intraperitoneal injected with Louisiana crude oil
- Exposure of zebrafish embryos to 2- and 6-hydroxychrysene, chrysene and phenanthrene to assess developmental toxicity
- Cytotoxicity and CYP1A inhibition in rainbow trout liver (RTL-W1) cell lines exposed to dispersant Corexit 9500 and its major surfactant components
- Acute toxicity and genotoxicity of Corexit® dispersants and their components on early life stages of sheepshead minnow (*Cyprinodon variegatus*)

For more information, contact Maggie Dannreuther at maggied@ngi.msstate.edu.

Source: <http://gulfresearchinitiative.org/scientists-awarded-50-million-to-study-effects-of-oil-on-gulf-of-mexico-ecosystem/>

Recent Publications

Journal Articles

The list below provides a selection of research articles focusing on the Gulf of Mexico.

- ▶ [Crude oil impairs immune function and increases susceptibility to pathogenic bacteria in southern flounder](#)
Bayha, K.M., N. Ortell, C.N. Ryan, K.J. Griffitt, M. Krasnec, J. Sena, T. Ramaraj, R. Takeshita, G.D. Mayer, F. Schilkey, and R.J. Griffitt. 2017. Crude oil impairs immune function and increases susceptibility to pathogenic bacteria in southern flounder. *PLoS One* 12(5):e0176559.
- ▶ [A novel cardiotoxic mechanism for a pervasive global pollutant](#)
Brette, F., Shiels, H. A., Galli, G. L. J., Cros, C., Incardona, J. P., Scholz, N. L., and Block, B. A. 2017. A Novel Cardiotoxic Mechanism for a Pervasive Global Pollutant. *Scientific Reports* 7 Published online.
- ▶ [National estimation of seafood consumption in Mexico: Implications for exposure to methylmercury and polyunsaturated fatty acids](#)
Cantoral, A., C. Batis, and N. Basu. 2017. National estimation of seafood consumption in Mexico: Implications for exposure to methylmercury and polyunsaturated fatty acids. *Chemosphere* 174:289-296.
- ▶ [Environmental indicators of oyster norovirus outbreaks in coastal waters](#)
Chenar, S.S. and Z. Deng. 2017. Environmental indicators of oyster norovirus outbreaks in coastal waters. *Marine Environmental Research* 130:275-281.
- ▶ [Development of genetic programming-based model for predicting oyster norovirus outbreak risks](#)
Chenar, S.S. and Z. Deng. 2018. Development of genetic programming-based model for predicting oyster norovirus outbreak risks. *Water Research* 128:20-37.

- ▶ [Ciguatoxicity of *Gambierdiscus* and *Fukuyoa* species from the Caribbean and Gulf of Mexico](#)
Litaker, R.W., W.C. Holland, D.R. Hardison, F. Pisapia, P. Hess, S.R. Kibler, and P.A. Tester. 2017. Ciguatoxicity of *Gambierdiscus* and *Fukuyoa* species from the Caribbean and Gulf of Mexico. *PLoS One* 12(10):e0185776.
- ▶ [Mercury levels of yellowfin tuna \(*Thunnus albacares*\) are associated with capture location](#)
Nicklisch, S.C.T., L.T. Bonito, S. Sandin, and A. Hamdoun. 2017. Mercury levels of yellowfin tuna (*Thunnus albacares*) are associated with capture location. *Environmental Pollution* 229:87-93.
- ▶ [Environmental exposure to dioxins, dibenzofurans, bisphenol A, and phthalates in children with and without autism spectrum disorder living near the Gulf of Mexico](#)
Rahbar, M.H., H.M. Swingle, M.A. Christian, M. Hessabi, M.J. Lee, M.R. Pitcher, S. Campbell, A. Mitchell, R. Krone, K.A. Loveland, and D.G. Patterson. 2017. Environmental Exposure to Dioxins, Dibenzofurans, Bisphenol A, and Phthalates in Children with and without Autism Spectrum Disorder Living near the Gulf of Mexico. *International Journal of Environmental Research and Public Health* 14(11):1425.
- ▶ [Mercury biomagnification through food webs along a salinity gradient down-estuary from a biological hotspot](#)
Rumbold, D.G., T.R. Lange, D. Richard, G. DelPizzo, and N. Hass. 2018. Mercury biomagnification through food webs along a salinity gradient down-estuary from a biological hotspot. *Estuarine, Coastal and Shelf Science* 200:116-125.
- ▶ [Post-Deepwater Horizon blowout seafood consumption patterns and community-specific levels of concern for selected chemicals among children in Mobile County, Alabama](#)
Sathiakumar, N., M. Tipre, A. Turner-Henson, L. Chen, M. Leader, and J. Gohlke. 2017. Post-deepwater horizon blowout seafood consumption patterns and community-specific levels of concern for selected chemicals among children in Mobile County, Alabama. *International Journal of Hygiene and Environmental Health* 220:1-7.
- ▶ [Development of artificial intelligence approach to forecasting oyster norovirus outbreaks along Gulf of Mexico coast](#)
Shamkhali, S. and Z. Deng. 2018. Development of artificial intelligence approach to forecasting oyster norovirus outbreaks along Gulf of Mexico coast. *Environment International* 111:212-223.
- ▶ [A multi-year study of hepatic biomarkers in coastal fishes from the Gulf of Mexico after the Deepwater Horizon Oil Spill](#)
Smeltz, M., L. Rowland-Faux, C. Ghiran, W.F. Patterson, S.B. Garner, A. Beers, Q. Mievre, A.S. Kane, and M.O. James. 2017. A multi-year study of hepatic biomarkers in coastal fishes from the Gulf of Mexico after the Deepwater Horizon Oil Spill. *Marine Environmental Research* 129:57-67.
- ▶ [Occurrence and distribution of microplastics at selected coastal sites along the southeastern United States](#)
Yu, X., S. Ladewig, S. Bao, C.A. Toline, S. Whitmire, and A.T. Chow. 2018. Occurrence and distribution of microplastics at selected coastal sites along the southeastern United States. *Science of The Total Environment* 613-614:298-305.

Upcoming Meetings and Conferences

[2018 Great Lakes Commission Semiannual Meeting and Great Lakes Day](#)

March 6-8, 2018
Washington, DC

[148th Annual Meeting of the American Fisheries Society - Communicating the Science of Fisheries Conservation to Diverse Audiences](#)

August 19-23, 2018
Atlantic City, New Jersey

[Organization of Fish and Wildlife Information Managers Annual Conference and Business Meeting](#)

November 4-8, 2018
Hood River, Oregon

[International Association for Great Lakes Research 61st Annual Conference: Great Science for Tomorrow's Solutions](#)

June 18-22, 2018
Toronto, Canada

[72nd Annual Pacific Coast Shellfish Growers Association Shellfish Conference and Tradeshow](#)

October 14-18, 2018
Blaine, WA

[Fish Passage 2018 - International Conference on River Connectivity: Incorporating the First Symposium on Hydropower and Fish Management](#)

December 10-14, 2018
Albury, New South Wales, Australia

Additional Information

This monthly newsletter highlights current information about fish and shellfish.

For more information about specific advisories within the state, territory, or tribe, contact the appropriate state agency listed on EPA's National Listing of Fish Advisories website at <https://fishadvisoryonline.epa.gov/Contacts.aspx>.

For more information about this newsletter, contact Sharon Frey (Frey.Sharon@epa.gov, 202-566-1480).

Additional information about advisories and fish and shellfish consumption can be found at <https://www.epa.gov/fish-tech>.