EPA United States Environmental Protection Agency

Fish and Shellfish Program NEWSLETTER

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In This Issue

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

Recent Advisory News

Commonwealth of Pennsylvania 2019 Fish Consumption Public Health Advisory

The Commonwealth of Pennsylvania has released its 2019 fish consumption public health advisories.

Health Benefits of Eating Fish

Fish are nutritious and good to eat. They are low in fat, high in protein, and provide substantial human health benefits. Fish provide valuable vitamins and minerals and beneficial oils that are low in saturated fat. Omega-3 fatty acids found in fish are also beneficial, particularly in terms of cardiovascular health. Preliminary evidence suggests that early exposure to omega-3 fats may enhance brain development as well. The federal Food and Drug Administration (FDA) recommends that consumers eat a balanced diet, choosing a variety of foods including fruits and vegetables, foods that are low in trans fat and saturated fat, as well as foods rich in high fiber grains and nutrients. A diet that includes a variety of fish and shellfish can be an important part of a balanced healthy diet. The FDA, U.S. Environmental Protection Agency (EPA), American Heart Association, and other nutrition experts recommend eating two meals (12 ounces) of fish per week. Following these advisories means that consumers should feel comfortable making one of those meals (up to 8 ounces) a recreationally caught Pennsylvania sport fish.

Contaminants in Fish

While most recreationally caught sport fish in Pennsylvania are safe to eat, chemicals such as mercury and polychlorinated biphenyls (PCBs) have been found in some fish from certain waters. The levels of these unavoidable chemical contaminants are usually low; however, they could potentially be a health concern to pregnant and breast-feeding women, women of childbearing age, and children and individuals whose diet consists of a high percentage of fish.

Long-lasting contaminants such as PCBs, chlordane, and mercury build up in the body over time. It may take months or years of regularly eating contaminated fish to build up amounts that are a health concern. Health problems that may result from the contaminants found in fish range from small changes in health that are hard to detect to birth defects and cancer. Mothers who eat highly contaminated fish for many years before

becoming pregnant may have children who are slower to develop and learn. The meal advice in this advisory is intended to protect children from these potential developmental problems. Adults are less likely to have health problems at the low levels that affect children. Following the advisory over a lifetime will minimize exposure and reduce health risks associated with contaminants in fish.

Introduction to Fish Consumption Advisories

It is important to note that the Pennsylvania Department of Health does not recommend that residents stop eating sport-caught fish, except where “Do Not Eat” is shown in the advisory listing. When properly prepared, eating fish regularly offers important health benefits as a good choice to replace high-fat foods. These benefits will be gained if the sport fish consumption advisory is carefully followed to choose safer places to fish; pick safer species to eat; trim and cook the catch correctly; and follow the recommended meal frequencies. Using this advice, exposure will be reduced to possible contamination.

Consumption advisories provide guidance to individuals or segments of the population that are at greater risk from exposure to contaminants in fish. Advisories are not regulatory standards, but are recommendations intended to provide additional information of particular interest to high-risk groups. These advisories apply only to recreationally caught sport fish in Pennsylvania, not commercial fish. The FDA establishes the legal standards for contaminants in food sold commercially, including fish.

Statewide Advisory

Pennsylvania has issued a general, statewide health advisory for recreationally caught sport fish advising that individuals eat no more than one meal (one-half pound) per week of sport fish caught in the state’s waterways. This general advice was issued to protect against eating large amounts of fish that have not been tested or that may contain unidentified contaminants.

How to Use this Advisory

Follow the general, statewide one meal per week advisory to limit exposure to contaminants. To determine if more protective advice applies to a species of fish, find the locations and species of fish caught in the tables that follow. Find the meal advice for the fish of interest. “Do Not Eat” means no one should eat those fish because of very high contamination. The other groups ("Two meals a Month," "One Meal a Month," "One Meal Every Two Months") provide advice for how often to eat a fish meal.

One meal is assumed to be one-half pound of fish (eight ounces before cooking) for a 150-pound person. The meal advice is generally equally protective for larger people who might eat larger meals, and smaller people who might eat smaller meals.

People who regularly eat sport fish, women of childbearing age, and children are particularly susceptible to contaminants that build up over time. If an individual falls into one of these categories, they should be especially careful to space fish meals out according to state advisories. A body can get rid of some contaminants over time. Spacing the meals out helps prevent the contaminants from building up to harmful levels in the body. For example, if the fish you eat is in the "One Meal a Month Group" wait a month before eating another meal of fish from any restricted category.

Women beyond their childbearing years and men generally face fewer health risks from these contaminants. However, it is recommended that these populations also follow the advisory to reduce their total exposure to contaminants. For these groups, it is the total number of meals during the year that becomes important, and many of those meals can be eaten during a few months of the year. If most of the fish consumed are from the "One Meal a Month" category, these populations should not exceed 12 meals per year.

Sometimes, anglers catch fish with external growths, sores, or other lesions. Such abnormalities generally result from viral or bacterial infections and may occasionally be caused by exposure to certain chemical contaminants. The appearance of viral or bacterial infections in fish may be unsightly, but there is no evidence to suggest that these infections pose a threat to consumers of these fish. Whether or not to eat such fish is a matter of personal choice.

2019 Additions and Changes to Fish Consumption Advisories

The following table lists new additions and changes to the Commonwealth of Pennsylvania Fish Consumption Advisories for 2019.

2019 Commonwealth of Pennsylvania Fish Consumption Advisories ● = New Addition ● = Change					
River Basin	**Waterbody**	**Area Under Advisory**	**Species**	**Meal Frequency**	**Contaminant**
Delaware River Basin	● Brady's Lake *(Monroe Co.)*	Entire Lake	Chain Pickerel	6 meals/year	Mercury
			Yellow Perch	1 meal/year	Mercury
Delaware River Basin	● Little Bushkill Creek *(Pike Co.)*	Lake Maskenozha to mouth	American Eel	2 meals/month	Mercury
Delaware River Basin	Red Clay Creek *(Chester Co.)*	● Entire Basin	● All species	● 3 meals/year	● PCB, DDT, Dioxins, Chlorinated-Pesticides
Susquehanna River Basin	Black Moshannon State Park Lake *(Centre Co.)*	Entire Lake	Chain Pickerel	● 2 meals/month	Mercury
Susquehanna River Basin	Susquehanna River *(Snyder, Northumberland, Juniata, Perry, Dauphin, Cumberland, York and Lancaster Co.)*	West Branch to PA/MD border	Catfish over 20 inches ● Flathead catfish over 30 inches	1 meal/month	PCB Mercury
Susquehanna River Basin	West Branch Susquehanna River *(Clinton, Lycoming, Union and Northumberland Co.)*	Bald Eagle Creek to confluence with Susquehanna River	● Walleye	● 2 meals/month	● Mercury
Susquehanna River Basin	White Deer Creek *(● Clinton, Centre and Union Co.)*	● Entire basin	Brown Trout	2 meals/month	Mercury
Ohio River Basin	Sugar Lake *(Crawford Co.)*	Entire Lake	● Largemouth Bass, Chain Pickerel	2 meals/month	Mercury

For Additional Information

The advisory listing in the Fish and Boat Commission's Summary of Fishing Regulations and Laws is published annually; however, fish consumption advisories may be issued or lifted periodically throughout the year. Not all fish consumption advisories are listed in the summary table above. Notice of changes to the Summary of Fishing Regulations and Laws are released to the public through press releases or are described on the state's website.

For further information or the most current advice contact:

- Pennsylvania Department of Environmental Protection at (717) 787-9637, or visit: www.dep.pa.gov for questions concerning current advisory listings, waters sampled, sampling methods;
- Pennsylvania Department of Health at (717) 787-3550, or visit: www.health.pa.gov for questions about effects of chemicals on human health;
- Pennsylvania Fish and Boat Commission at (814) 359-5147, or visit: www.fishandboat.com for questions about effects of chemicals on fisheries, current advisory listings, and other related fishing regulations.

Source:
http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/FishConsumption/FishAdvisory/FINAL-2019-Summary-Book_consumption_excerpt.pdf and https://www.dep.pa.gov/Business/Water/CleanWater/WaterQuality/FishConsumptionAdvisory/Pages/default.aspx

EPA News

EPA Approves Idaho's New and Revised Human Health Water Quality Criteria for Toxics and Other Water Quality Standards Provisions

On April 4, 2019, EPA approved the State of Idaho's water quality standards (WQS) for toxic pollutants after determining the standards are consistent with the Clean Water Act (CWA) and are protective of human health.

Background

Under the CWA, states and authorized tribes have the primary responsibility for establishing and revising WQS for bodies of water, and EPA has the responsibility for approving these standards. These WQS include the designated uses for a waterbody or waterbody segment and the water quality criteria necessary to protect those designated uses.

Consistent with the State's recreational use designations, the Idaho Department of Environmental Quality (IDEQ) developed its new and revised human health criteria for toxic pollutants using fish consumption survey data to set criteria that protect the general population and Idaho tribes who are known to eat more fish than the general population. EPA reviewed Idaho's human health criteria for toxic pollutants for consistency with the CWA and its implementing regulations. Learn more at https://www.epa.gov/wqs-tech/water-quality-standards-regulations-idaho.

Summary of Recent Fish Consumption Surveys in Idaho

From spring 2014 to spring of 2015, IDEQ conducted telephone surveys of Idaho residents (including anglers) to collect fish consumption data that were used to establish fish consumption rates (FCRs) for Idaho's general population as well as for recreational anglers in the state. These FCRs were based on statistical modeling of short-

term dietary recall data. The modeling methodology was originally developed by the National Cancer Institute (NCI), and is commonly referred to as the "NCI method." Many believe the NCI method to be the state-of-the-art approach for conducting dietary intake surveys, including consumption of fish. Idaho considered these survey results in developing its new and revised state water quality criteria.[1] IDEQ's survey presented, for both the general population and recreational anglers, consumption of 1) total fish and 2) fish obtained from Idaho waters (excluding salmon with the exception of steelhead). EPA recommends including species from freshwater, near coastal, and estuarine habitats when determining FCRs for use in deriving human health criteria because those are the waters under CWA jurisdiction.[2] The EPA includes species from those waters when calculating its recommended FCRs based on national data. Survey results and FCR statistics for the Idaho general population and recreational anglers are as follows in Tables 1 and 2.

Table 1. Idaho General Population and Recreational Angler Total Fish Consumption Rates (grams per day)

Population	Sample Size	Statistic					
		50%	Mean	75%	90%	95%	99%
General Population	2,959	14.2	22.0	29.7	51.1	67.7	118
Anglers	1,175	15.9	26.5	36.9	64.6	86.4	146

Table 2. Idaho General Population and Recreational Angler Consumption Rates (grams per day) for Fish Obtained in Idaho

Population	Sample Size	Statistic					
		50%	Mean	75%	90%	95%	99%
General Population	2,959	0.1	2.3	0.8	4.7	11.2	40.5
Anglers	1,175	0.6	4.5	2.9	10.8	21.4	62.4

From 2014 to 2015, the Nez Perce and Shoshone-Bannock Tribes in Idaho conducted surveys of current fish consumption. Additionally, the Nez Perce, Shoshone-Bannock, Kootenai of Idaho, and Coeur d'Alene Tribes in Idaho prepared reports detailing historic or heritage FCRs. The surveys were funded with General Assistance Program funding, under an EPA contract, and involved three consulting firms with relevant expertise. The current FCR for each of the two tribes was derived using the NCI methodology described in the previous section as well as a food frequency questionnaire (FFQ) approach.[3] NCI results for the Nez Perce Tribe were deemed most relevant for derivation of WQS based on preference for the NCI method and the fact that NCI Nez Perce Tribe's FCRs were greater than those determined for the Shoshone Bannock Tribe. Survey results and current NCI-based FCR statistics for species of CWA relevance (freshwater, near coastal, and estuarine species) for the Nez Perce Tribe are summarized in Table 3.

Table 3. FCRs for the Nez Perce Tribe in Idaho Using National Cancer Institute Methodologies (NCI)
(Note: FCRs represent consumption of fish of Clean Water Act relevance)

Population	Sample Size	Statistics					
		50%	Mean	75%	90%	95%	99%
Nez Perce	446	36	66.5	81.7	159.4	233.9	NA

The survey and data analyses were peer reviewed by recognized experts in survey design, implementation, and analysis of both the NCI and FFQ survey data.[4] IDEQ considered all of the survey results, including results from the

Nez Perce and Shoshone-Bannock Tribes, who are high-consuming subpopulations in the state. Ultimately, IDEQ selected the mean FCR derived from Nez Perce Tribe data, for an FCR of 66.5 grams per day. The selected FCR is equal to approximately the 95th percentile Idaho general population consumption rate for all fish, the 90th percentile of the Idaho angler population, and the 70th percentile of the Nez Perce consumption rate (the highest of the surveyed tribes). This FCR selection is consistent with the EPA's 2000 Human Health Methodology.

For more information on the development of Idaho's human health water quality criteria, contact Dan Opalski at (206) 553-1855 or opalski.dan@epa.gov.

End Notes

1 Idaho Human Health Criteria Update Justification and Compliance with the Clean Water Act, Idaho Docket 58-0102-1201 (Dec. 2016) (hereinafter "Idaho HHC Update Justification") pp. 6-13. Available at http://www.deq.idaho.gov/media/60179450/58-0102-1201-human-health-criteria-justification-compliance-clean-water-act-1216.pdf

2 Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health. U.S. Environmental Protection Agency, Office of Water, Washington, D.C., EPA-822-B-00-004 (Oct. 2000), pp. 4-24 (hereinafter "EPA's 2000 Human Health Methodology"). Available at https://www.epa.gov/wqc/human-health-water-quality-criteria. Human Health Ambient Water Quality Criteria and Fish Consumption Rates: Frequently Asked Questions, U.S. Environmental Protection Agency (Jan. 2013). Available at https://www.epa.gov/wqc/human-health-ambient-water-quality-criteria-and-fish-consumption-rates-frequently-asked

3 Food frequency questionnaire approaches ask respondents to estimate their consumption of dietary items of interest over the course of some period of time, for example a year.

4 External Peer Review of EPA's Draft Document: A Fish Consumption Survey of the [Shoshone-Bannock Tribes] [Nez Perce Tribe] Combination Draft Final Report, Contract No. EP-C-13-010 Task Order 2015-24 (Oct. 7, 2015).

Source: https://www.epa.gov/sites/production/files/2019-04/documents/04042019_cover_letter_approval_of_deq_human_health_criteria_signed.pdf

Other News

New Video Features State Methods for Sampling to Keep Shellfish Industry at Work and Consumers Safe

A recent video highlights Rhode Island's upgrading of its shellfish monitoring program in the wake of an unprecedented harmful algal bloom. The bloom shut parts of Narragansett Bay to shellfish harvesting in 2016, and Rhode Island did not have an FDA-approved method for re-opening the waters once they were cleared of the bloom. This meant that harvesters and dealers had to throw away shellfish that would have been safe to eat but had been kept out of the market. Rhode Island's state agencies, including the Rhode Island Department of Health and the Rhode Island Department of Environmental Management, worked to fix this problem in collaboration with the Rhode Island Coastal Resources Management Council and the shellfish industry to ensure the safety of shellfish for consumers.

As part of its "Shellfish Shorts' series, the Rhode Island Sea Grant posted Shellfish Shorts Episode 6: The Science Behind Shellfish Safety to highlight the state's work on this issue.

For more information, contact Henry Leibovitz at Henry.Leibovitz@health.ri.gov.

Source: https://www.youtube.com/watch?v=2f6PnqyAcH4&feature=youtu.be.

Ocean Temperatures Could Influence Algal Bloom Occurrence in Alaska

On July 18, 2018, the National Oceanic and Atmospheric Administration (NOAA) reported that in the first major study of the harmful algal bloom species *Alexandrium catenella* (*A. catenella*) in Cook Inlet, Alaska, its scientists found a link between ocean temperature and bloom development. *Alexandrium* species produce a neurotoxin responsible for paralytic shellfish poisoning (PSP), which happens after consuming shellfish with accumulated toxin. PSP poses a serious health threat in Alaska and prevents effective use of shellfish resources.

Photomicrograph of *Alexandrium catenella* cells. *(Photo courtesy of NOAA)*

Though PSP toxins in Alaskan shellfish are well characterized, little is known about the environmental conditions that foster toxic *A. catenella* blooms. To address this question, scientists collected water samples and environmental monitoring data along Lower Cook Inlet and Kachemak Bay over a five-year period between 2012 and 2017. During the course of the study, the northern Pacific underwent a warming event that caused average winter minimum and summertime maximum water temperatures to increase by more than 2°C. These elevated water temperatures promoted greater development of *A. catenella* blooms in Kachemak Bay, causing shellfish collected in the latter portion of the study to become toxic.

Further analysis of monthly surface water temperatures showed that other periods of anomalously warm conditions occurred repeatedly between 1998 and 2016. Many of these shellfish toxicities exceeded the FDA action level (80 micrograms of toxin per 100 grams of edible shellfish tissue). During periods with cold anomalies, shellfish toxicity was generally low. The analysis indicated that regional water temperature data may be used as an early indicator of *A. catenella* bloom formation and PSP risk in the region, and potentially, across the state.

The findings have serious implications for coastal regions of the arctic and subarctic where *Alexandrium* blooms are normally suppressed by cold water temperatures. Recent rising ocean temperatures in the Bering and Chukchi seas have resulted in record low winter sea ice and may promote *Alexandrium* blooms, resulting in accumulation of PSP toxins in marine mammals and seabirds, and increased risk to human populations dependent on these resources.

For more information, contact Mark Vandersea at Mark.W.Vandersea@noaa.gov.

Source: https://coastalscience.noaa.gov/news/ocean-temperatures-could-influence-algal-bloom-occurrence-in-alaska/

Study Finds Pharmaceuticals, Other Contaminants in Chesapeake Bay and Charleston Harbor

On November 28, 2018, NOAA reported that its scientists recently completed regional assessments of the contaminants of emerging concern (CEC) for Chesapeake Bay, Maryland, and Charleston Harbor, South Carolina. Conducted as part of NOAA's National Status and Trends (NS&T) Mussel Watch Program, these regional pilot studies sampled oyster and sediment from study areas to quantify the magnitude and distribution of CECs, such as pharmaceutical and personal care products (PPCPs), pesticides, flame retardants, new industrial chemicals, stain resistant compounds, and endocrine-disrupting chemicals.

Oyster collection in South Carolina tidal marsh. *(Photo courtesy of NOAA)*

Results indicated that CECs are being accumulated at various degrees in coastal resources and the environment, with perfluorinated compounds (PFCs), the flame retardants, and current use pesticides being the most common to both study areas. In the Chesapeake Bay, at least one PFC and polybrominated diphenyl ether (PBDE) flame retardant was found across all sediment samples, with PFCs and PBDEs detected in 40 percent and 21 percent, respectively. Alternative (non-brominated) flame retardants were the least detected of all CEC classes. The highest concentration CECs found in Maryland oyster tissues were linked to the pharmaceuticals prednisone, hydrocortisone, and acetaminophen. PPCPs, on the other hand, were detected far less frequently than PBDEs and PFCs in Maryland oyster tissue and sediment.

As in the Chesapeake Bay samples, at least one CEC was detected at each South Carolina station for both sediment and oyster samples, and overall CEC detection frequencies followed a similar overall pattern. PFCs were the most common in sediments and oysters. The flame retardants were also often detected in both sediments and oysters in South Carolina samples. The highest concentrations reported in Charleston Harbor sediments, however, were for current use pesticides.

Overall occurrence and distribution of some CEC chemicals appeared to be associated with land use from the watershed adjacent to the survey sites, although further study is required to confirm this association. In general, the number of reported concentrations at urban sites was elevated compared to the suburban sites in both study areas. The same relative numbers were observed between suburban and undeveloped (or reference) sites.

For management purposes, these findings constitute unprecedented baseline information on CECs. With the exception of an existing EPA health advisory for PFCs in drinking water, there are currently no federal standards or guidelines to assess the maximum contaminants threshold for the majority of CEC chemicals in the environment. Thus, although organisms in the environment may be exposed to these chemicals, it is challenging to relate environmental concentrations of CECs to impacts on organisms. Overall, the detection of these compounds in sediment and oyster tissue is evidence of their presence and potential accumulation in the environment and in coastal resources.

NOAA's Mussel Watch Program has monitored the nation's coastal waters for chemical contaminants and biological indicators of water quality since 1986. With the goal to support ecosystem management nationwide, Mussel Watch and its sister program, the National Bioeffects Program, conduct environmental monitoring, assessment, and research to describe the status and trends in the environmental quality of the nation's estuarine and coastal waters. In response to recent public concerns about the widespread distribution and potential impacts of these unregulated contaminants, NOAA's National Centers for Coastal Ocean Science, through the Mussel Watch Program, has investigated the prevalence and magnitude of CEC chemicals in our coastal areas through a series of pilot studies.

For more information, contact Dennis Apeti at dennis.apeti@noaa.gov.

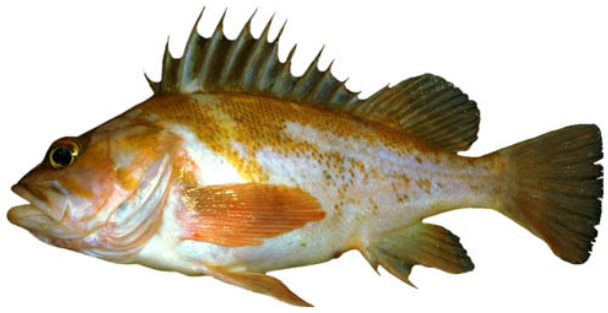
Citation: Apeti, D.A., E. Wirth, A.K. Leight, A. Mason, and E. Pisaski. 2018. An Assessment of Contaminants of Emerging Concern in Chesapeake Bay, MD and Charleston Harbor, SC. NOAA Technical Memorandum NOS NCCOS 240. Silver Spring, MD. 104 pp. doi:10.25923/p4nc-7m71

Source: https://coastalscience.noaa.gov/news/study-finds-pharmaceuticals-and-other-contaminants-in-chesapeake-bay-and-charleston-harbor/

Recently Awarded Research

NFWF Announces $521,833 in Grants to Support Sustainable Fisheries in Six States

On December 3, 2018, the National Fish and Wildlife Foundation (NFWF) announced $521,833 in grants to support sustainable fisheries through fishermen and community-led projects in California, Florida, Louisiana, Alaska, Massachusetts, and Hawaii. The grants will generate $780,287 in matching contributions for a total conservation impact of more than $1.3 million.



Copper rockfish. *(Photo courtesy of NOAA)*

The grants were awarded through the Fisheries Innovation Fund (FIF), a partnership between NFWF and NOAA. This year's projects will reduce bycatch, address the needs of recreational fisheries and enhance sustainable economic opportunities for fishing communities around the U.S.

"NFWF is excited to support these locally led projects that will advance marine aquaculture, increase public access for recreational anglers and build capacity in fisheries and fishing communities," said Jeff Trandahl, Executive Director and CEO of NFWF.

Grant recipients will build capacity among fishermen and fishing communities, promote full utilization of annual catch limits, and help implement marine aquaculture by developing new markets, increasing fishing access, minimizing bycatch, and reducing discard mortality.

Examples of projects funded through these grants include:

- Local Bounty will test new troll gear to maximize catch of target rockfish while reducing bycatch of overfished species of concern such as cowcod and yelloweye in the Monterey Bay area of California.
- In Alaska, Aleutians East Borough will pilot a new initiative that advances aquaculture development through identifying sites to implement kelp mariculture.
- The University of Hawaii will improve recreational fishing opportunities by mapping access points.

A complete list of the 2018 grants made through FIF is available here.

"The Fisheries Innovation Fund provides critical support for initiatives developed by fishermen and fishing communities," said Chris Oliver, Assistant Administrator for NOAA Fisheries. "We are committed to our partnership with NFWF in support of innovative approaches to sustainable management of recreational and commercial fisheries. We look forward to collaborating with the grant recipients on projects that enhance fishing opportunities and strengthen coastal communities."

FIF was established in 2010 to increase revenue and provide sustainable access and fishing opportunities for both commercial and recreational fishermen in the U.S. Since its inception, FIF has awarded $10.4 million to 104 projects in the Northeast, the mid-Atlantic, the Caribbean, the Gulf of Mexico, the Pacific coast, Hawaii, Alaska, and the Great Lakes.

Source: https://www.nfwf.org/whoweare/mediacenter/pr/Pages/nfwf-announces-grants-to-support-sustainable-fisheries-in-six-us-states-2018-1203.aspx

Tech and Tools

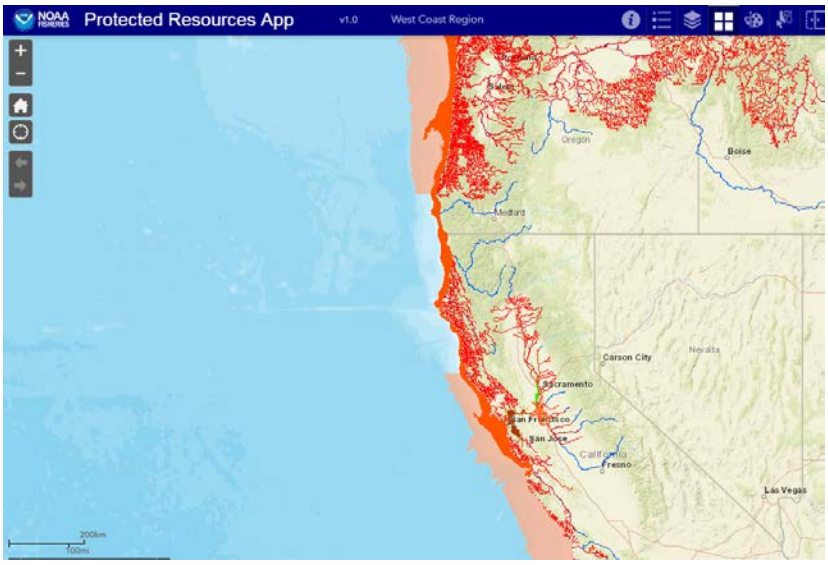
New App Makes Endangered Species Habitat Easy to Find

On February 22, 2019, NOAA Fisheries announced the launch of a new Protected Resources Application (app) for the west coast region that quickly and easily displays the locations of marine and anadromous species and their habitats protected under the Endangered Species Act (ESA).

The app draws on geographic information system (GIS) data, making it simple for the public, tribes, and government agencies, among others, to identify protected habitats. For example, users can easily create detailed maps comparing the habitat of different ESA-listed salmon and steelhead stocks and see where their habitats overlap.

Through the app, landowners can find out if their property contains ESA-designated critical habitat, grant applicants can focus and maximize habitat restoration proposals in areas where multiple protected species reside, and field biologists can decipher whether their geographic position is within a protected area by loading the app on any mobile device and using the "My Location" feature.

"This app provides a one-stop shop for NOAA Fisheries' geospatial data throughout Washington, Idaho, Oregon, and California and along the coast," said Scott Rumsey, Deputy Regional Administrator of NOAA Fisheries' West Coast Region. "It helps organize and display mountains of data into something that is truly user-friendly. It will prove a valuable tool in helping to visually interpret NOAA Fisheries regulations and better understand how our sea turtles, marine mammals, and fish are distributed."



This data layer displays the critical habitat of protected species on the West Coast. *(Photo courtesy of NOAA)*

In addition to NOAA Fisheries data, the app displays real-time data from external sources such as the U.S. Census Bureau, which provides congressional district and tribal boundary information. This helps keep data and spatial relationships current. NOAA Fisheries will continue to expand and update the app tools and incorporate new data.

Before this app, geographic data were available in many different formats and only accessible to those with specialized GIS software to open the files. Now, anyone with a computer and an internet connection can explore the data.

Use the Protected Species App in any web browser. Once in, click on the "Layers" icon to access and display datasets depicting different geographic areas. Users can draw on maps, for a truly customized experience, as well as share maps.

"The data development for this app took five years and I'm really excited to share the final product with the dedicated people who want protected species to recover and thrive," said Shanna Dunn, of NOAA Fisheries West Coast Region and app designer. "I hope that more accessible protected species data will support conservation efforts."

For more information, contact Shanna Dunn at Shanna.Dunn@noaa.gov.

Source: https://www.fisheries.noaa.gov/feature-story/new-app-makes-endangered-species-habitat-easy-find?utm_medium=email&utm_source=govdelivery

Recent Publications

Journal Articles

The list below provides a selection of current research articles.

- Consumption of contaminated seafood in an environmental justice community: A qualitative and spatial analysis of fishing controls
  Basra,K., M. P. Fabian, and M. K. Scammell. 2018. Consumption of contaminated seafood in an environmental justice community: A qualitative and spatial analysis of fishing controls. *Environmental Justice* 11(1): 6-14.

- Persistent organic pollutants in fish from Charleston Harbor and tributaries, South Carolina, United States: A risk assessment
  Fair, P A., N. D. White, B. Wolf, S. A. Arnott, K. Kannan, R. Karthikraj, and J. E. Vena. 2018. Persistent organic pollutants in fish from Charleston Harbor and tributaries, South Carolina, United States: A risk assessment. *Environmental Research* 167: 598-613.

- Optical probe for the analysis of trace indole in shrimp
  Federico-Perez, R. A. and Z. Xue. 2018. Optical probe for the analysis of trace indole in shrimp. *Analytical Biochemistry* 557: 104-10.

- Using a dynamic bioenergetics-bioaccumulation model to understand mechanisms of uptake and bioaccumulation of salmon-derived contaminants by stream-resident fish
  Gerig, B. S., N. T. Hermann, D. T. Chaloner, and G. A. Lamberti. 2019. Using a dynamic bioenergetics-bioaccumulation model to understand mechanisms of uptake and bioaccumulation of salmon-derived contaminants by stream-resident fish. *Science of The Total Environment* 652: 633-42.

- Effects of salinity and transparent exopolymer particles on formation of aquatic aggregates and their association with norovirus
  Hanley, K. T., S. Wuertz, A. Schriewer, U. Passow, W. Smith, P. Olin, and K. Shapiro. 2018. Effects of salinity and transparent exopolymer particles on formation of aquatic aggregates and their association with norovirus. *Science of The Total Environment* 643: 1514-1521.

- Bioaccumulation of non-essential hazardous heavy metals and metalloids in freshwater fish. Risk to human health
  Hazrat, A. and K. Ezzat. 2018. Bioaccumulation of non-essential hazardous heavy metals and metalloids in freshwater fish. Risk to human health. *Environmental Chemistry Letters* 16(3): 903-917.

- Temporal trends of PCBs and DDTs in Great Lakes fish compared to those in air
  Hites, Ronald and T. M. Holsen. 2019. Temporal trends of PCBs and DDTs in Great Lakes fish compared to those in air. *Science of the Total Environment* 646: 1413-1418.

- Mercury concentrations in sentinel fish exposed to contaminated sediments under a natural recovery strategy within the St. Lawrence River Area of Concern at Cornwall, Ontario, Canada
  Lapointe, D. and J. J. Ridal. 2019. Mercury concentrations in sentinel fish exposed to contaminated sediments under a natural recovery strategy within the St. Lawrence River Area of Concern at Cornwall, Ontario, Canada. *Archives of Environmental Contamination and Toxicology* 76(2): 216-230.

- Performance of cold chains for Chesapeake Bay farmed oysters and modeled growth of *vibrio parahaemolyticus*
  Love, D. C., R. M. Lane, B. J. K. Davis, K. Clancy, J. P. Fry, J. Harding, and B. Hudson. 2019. Performance of cold chains for Chesapeake Bay farmed oysters and modeled growth of *vibrio parahaemolyticus*. *Journal of Food Protection* 82(1): 168-78.

- The relation between polychlorinated biphenyls and population metrics of 4 species of fish from the upper Hudson River, New York, USA
  Maceina, M. J and S. M. Sammons. 2019. The relation between polychlorinated biphenyls and population metrics of 4 species of fish from the upper Hudson River, New York, USA. *Environmental Toxicology and Chemistry* 38 (2): 329-339.

- Personalised fish intake recommendations: The effect of background exposure on optimisation
  Persson, M., S. Fagt, M. J. Nauta. 2018. Personalised fish intake recommendations: the effect of background exposure on optimisation. *The British Journal of Nutrition* 120 (8): 946-957.

- Interactive effects of hypoxia and temperature on coastal pelagic zooplankton and fish
  Roman, M. R., S. B. Brandt, E. D. Houde, and J. J. Pierson. 2019. Interactive effects of hypoxia and temperature on coastal pelagic zooplankton and fish. *Frontiers in Marine Science* 6: 139.

- A single meal containing phytosterols does not affect the uptake or tissue distribution of cholesterol in zebrafish (*Danio rerio*)
  van Spankeren, M., N. Sibinga, Ø. Reinshol, B. E. Torstense., Ø. Sæle, N. S. Liland. 2019. A single meal containing phytosterols does not affect the uptake or tissue distribution of cholesterol in zebrafish (*Danio rerio*). *Frontiers in Marine Science* 6: 92.

- Statistical models of fecal coliform levels in Pacific Northwest estuaries for improved shellfish harvest area closure decision making
  Zimmer-Faust, A. G., C. A. Brown, and A. Manderson. 2018. Statistical models of fecal coliform levels in Pacific Northwest estuaries for improved shellfish harvest area closure decision making. *Marine Pollution Bulletin* 137: 360-69.

Upcoming Meetings and Conferences

6th East Coast Trout Management and Culture Workshop
June 10-12, 2019
Frostburg, Maryland

2019 American Fish Society Fish Health Section Annual Meeting and 60th Western Fish Disease Workshop
June 17-20, 2019
Ogden, Utah

International Conference on Molluscan Shellfish Safety
September 13, 2019
Ensenada, Baja California

Organization of Fish and Wildlife Information Managers Annual Conference
October 6-10, 2019
Shepherdstown, West Virginia

International Association for Great Lakes Research 62nd Annual Conference
June 10-14, 2019
Brockport, New York

2019 Gulf and South Atlantic Shellfish Conference
August 4-7, 2019
Savannah, Georgia

American Fisheries Society & The Wildlife Society 2019 Joint Annual Conference
September 29 – October 3, 2019
Reno, Nevada

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.