EPA United States Environmental Protection Agency

# Fish and Shellfish Program NEWSLETTER

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## In This Issue





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

This issue of the *Fish and Shellfish Program Newsletter* generally focuses on Hawaii and the U.S. Territories.

## Recent Advisory News

### Hawaii Department of Health Issues Fish and Shellfish Advisory for Kaneohe Marine Corps Base Fuel Pier and Marina Area

On December 6, 2017, the Hawaii State Department of Health (DOH) advised the public not to eat fish and shellfish caught in the Kaneohe Marine Corps Base Hawaii (MCBH) Fuel Pier and Marina Area. Fish from the area may contain unsafe levels of harmful chemicals. Higher risk groups such as pregnant women, nursing mothers, women who are planning a pregnancy and children are especially sensitive to these chemicals. MCBH has issued a catch-and-release restriction for the area where recreational fishing is permitted on a limited basis.

Preliminary tests from two species of whole goatfish caught in the area indicate unsafe levels of polychlorinated biphenyls (PCBs) in the fish. Limited sampling of sediment in the area also found PCBs above U.S. Environmental Protection Agency (EPA) and DOH guidelines.

An ongoing investigation by the Navy/Marine Corps of the area shows the likely sources of contaminants in the fish were PCB-containing dielectric fluids from electrical transformers that may have leaked or spilled into the soil at the salvage yard. The salvage site was used to store excess construction and building materials during the 1940s and 1950s.

The DOH interim fish advisory will remain in effect until more extensive sampling is completed by the Navy/Marine Corps. DOH will work closely with MCBH to further investigate the impact of PCBs at the salvage yard site and determine if a long-term fish advisory is needed.

## DOH MCBH Advisory Factsheet: Interim Fish Advisory for Fuel Pier and Marina Area at the Marine Corps Base in Kaneohe, Hawaii

Frequently eating PCB-contaminated fish over a period of years may lead to PCBs building up in your body to levels that could affect your health. The health effects from eating fish contaminated with PCBs depend on:

- The concentration of PCBs in the fish you eat,
- How much fish you eat, and
- How long you eat it (for example, over weeks, months, or years).

Health effects also depend on your age, sex, diet, family traits, lifestyle, and overall state of health.

Eating large amounts of fish from this area for many years may put you at higher risk for cancer or other diseases.

**Studies have linked PCB exposure to these health conditions**

In the past, some people were exposed to very high levels of PCBs at work or from accidental poisoning.

- These people showed harmful health effects to their skin, eyes, and nerves.

**What are PCBs?**

- PCBs are man-made chemicals banned in the U.S. since 1976.
- PCBs were used extensively in manufacturing transformers, capacitors and other electrical equipment.
- PCBs stick to soil and sediment and remain in the environment for a long time.
- Fish take in PCBs when they eat sediment or smaller fish containing PCBs.
- PCBs build up in the fat of fish and can reach levels many times higher than the level in water or sediments.

Studies with animals showed that high levels of PCBs could harm the liver, digestive tract, and nerves; and could affect development, reproduction, and the immune system.

- PCBs have also been found to cause cancer in some animal studies.
- EPA says that PCBs probably can cause cancer in humans.

PCB levels in fish are much lower than levels that may have made people sick in the past from work or accidental poisonings. PCB levels in fish also are much lower than levels given to laboratory animals.

- Some studies suggest that low levels of PCBs, like those found in some fish, might cause small decreases in children's I.Q. or affect their memory, especially if exposures occur during pregnancy.

Your risk of cancer or other health effects from eating contaminated fish or shellfish cannot be predicted with certainty.

**Some groups are at higher risk for health effects from PCBs:**

- Pregnant women
- Nursing mothers
- Women who are planning a pregnancy
- Children

**It is unlikely that you will show obvious signs of harm from PCBs in fish and shellfish.**

- At the PCB levels measured by the Navy in whole goatfish from Fuel Pier and Marina Area at MCBH, DOH would not expect you to become ill from a single large meal or a few fish meals.
- However, frequent eating of PCB-contaminated fish over a period of months or years may lead to the buildup of PCBs that could affect your health.
- To prevent PCBs from causing harmful effects, DOH advises you to stop eating fish from the Fuel Pier and Marina Area at MCBH until further testing is completed.
- Over time, PCBs and other contaminants can slowly clear from your body and lessen your risk.
- To avoid any risk to your health, follow the DOH fish advisory.

**You can also protect your health by maintaining a healthy lifestyle.**

- Get regular exercise.
- Eat a balanced and nutritious diet including fish from uncontaminated waters.
- Moderate your alcohol intake if you drink.
- If you smoke, try to quit.
- Get regular medical checkups for yourself and your family.
- Minimize stress as much as possible.

**This interim advisory is based on limited sampling of whole goatfish by the U.S. Navy in the Fuel Pier and Marina Area. More testing will be done.**

- The fish were sampled to determine if PCBs from the Salvage Yard are concentrating in recreational fish.
- The testing revealed levels of PCBs that were higher than acceptable.
- Further testing will determine if the fillets versus the whole fish contain unsafe levels of PCBs.

For more information about DOH oversight of cleanup activities at the Salvage Yard, contact Beryl Ekimoto at beryl.ekimoto@doh.hawaii.gov. For health effects, contact Dr. Barbara Brooks at barbara.brooks@doh.hawaii.gov.

Source: https://health.hawaii.gov/news/files/2017/12/17-102-DOH-issues-fish-advisory.pdf

# EPA News

## New EPA Publications: *Effect of Green Macroalgal Blooms on the Behavior, Growth, and Survival of Cockles in Pacific NW Estuaries*; and *Presence of pharmaceuticals in fish from urban rivers*

EPA recently published two studies.

***Effect of Green Macroalgal Blooms on the Behavior, Growth, and Survival of Cockles* (Clinocardium nuttallii*) in Pacific NW Estuaries.*** Nutrient enrichment of estuaries has become a pervasive issue that adversely affects benthic flora and fauna throughout the world. The impact of nutrient enrichment on the provision of estuarine ecosystem services is poorly known; however, in U.S. Pacific Northwest estuaries nutrients are predominately derived from natural sources (e.g., upwelling and red alder), as opposed to the anthropogenic sources of nutrients found in the majority of U.S. estuaries. Scientists from EPA's Pacific Coastal Ecology Branch in Newport, Oregon, have quantified the association between naturally occurring green macroalgae (GMA) mats and an important shellfishery bivalve (*Clinocardium nuttallii*; heart cockles). Through a series of surveys and experiments in the field, GMA was found to alter the distribution of cockles on a tideflat, suppress shell growth, and increase mortality. Cockles demonstrated vertical and lateral migration to avoid smothering beneath the mats. This behavior consequently increased their vulnerability to gull and temperature induced mortality on the sediment surface. In laboratory experiments, the interaction of a weighted barrier and GMA presence elicited a more rapid emergence response in cockles than did the sole effect of anoxia, GMA presence, or a weighted barrier alone. This research reveals that macroalgal mats (which may be produced by nutrient pollution) can directly and indirectly reduce the growth and survival of a harvested bivalve species, and likely affect other clams similarly.

For more information, contact Nathaniel Lewis at lewis.nathaniel@epa.gov or Ted DeWitt at dewitt.ted@epa.gov. The full study can be found here: https://doi.org/10.3354/meps12328.

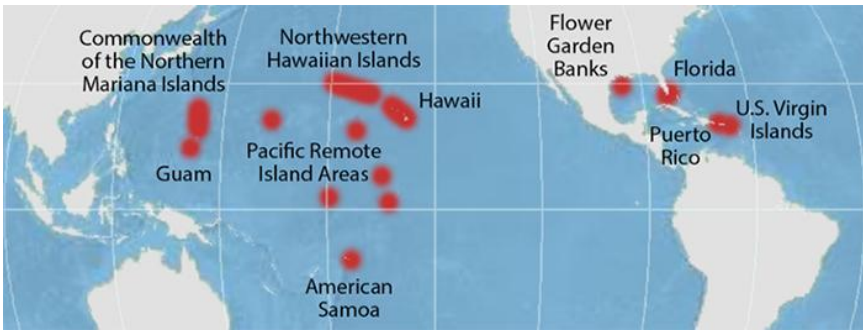
***Presence of pharmaceuticals in fish collected from urban rivers in the U.S. EPA 2008–2009 National Rivers and Streams Assessment.*** This study analyzed 20 pharmaceutical compounds in wild fish from 25 polluted U.S. river sites downstream from wastewater treatment plants (WWTPs). Thirteen of the 20 pharmaceuticals measured in fish fillets were at concentrations below 10 nanograms per gram (ng/g). The compounds that occurred most frequently were psychoactive drugs, including venlafaxine, carbamazepine, and its metabolite 2-hydroxy carbamazepine (58%, 27%, and 42%, respectively). This drug group is prescribed frequently and does not readily degrade in natural aquatic environments or as a result of conventional treatment in WWTPs. Additionally, two other drugs, salbutamol (also known as albuterol and treats asthma) and hydrochlorothiazide (a diuretic), were detected in 20% of the samples. The study concluded that seven pharmaceutical families (anti-inflammatories, antihelmintics, antiplatelet agents, ß-blockers, diuretics, psychoactive drugs, and antiasthmatics) were detected in eight fish species (white sucker, channel catfish, smallmouth bass, yellow perch, common snook,

largemouth bass, freshwater drum, and spotted bass). These concentrations in fish were caused by chronic exposure to water that was contaminated with these substances.

For more information, contact Leanne Stahl at stahl.leanne@epa.gov. The study can be found here: https://www.ncbi.nlm.nih.gov/pubmed/29635196.

## EPA has a New Coral Reef Website

EPA launched its new website on coral reefs. The site offers basic information about these intricate ecosystems, including what they are, where they are found, and why they are important. Coral reefs are among the most biologically diverse and valuable ecosystems on Earth. An estimated 25% of all marine life, including over 4,000 species of fish, is dependent on coral reefs at some point in their life cycle. Approximately half a billion people globally depend on coral reef ecosystems for food, coastal protection, and income from tourism and fisheries.




Map of tropical coral reef ecosystems within the U.S. This map provides the general geographic distribution of U.S. coral reef habitat. *(Map courtesy of National Oceanic and Atmospheric Administration)*

Healthy coral reefs provide:

- Habitat, feeding, spawning, and nursery grounds for over 1 million aquatic species, including commercially harvested fish species.
- Food for people living near coral reefs, especially on small islands.
- Recreation and tourism opportunities, such as fishing, scuba diving, and snorkeling, which contribute billions of dollars to local economies.
- Protection of coastal infrastructure and prevention of loss of life from storms, tsunamis, floods, and erosion.
- Sources of new medicines that can be used to treat diseases and other health problems.

Executive Order 13089, Coral Reef Protection calls for all federal agencies whose activities may affect coral reef ecosystems to:

- Identify such actions.
- Use their programs and authorities to protect and enhance coral reef ecosystems.

Creole wrasse and Porites, a species of stony coral. *(Photo courtesy of Charles LoBue/EPA)*

- Ensure that any actions they authorize, fund, or carry out will not degrade the condition of coral reef ecosystems.

EPA protects coral reefs by implementing Clean Water Act programs that protect water quality in watersheds and coastal zones of coral reef areas. EPA also supports efforts to monitor and assess the condition of U.S. coral reefs, and conducts research into the causes of coral reef deterioration. The Agency is developing tools to help coral reefs adapt to better handle changing conditions. Much of EPA's work to protect coral reefs is conducted in partnership with other federal agencies, states, and territories. For example, EPA is an active member of the interagency U.S. Coral Reef Task Force.

Sources: https://www.epa.gov/coral-reefs and https://www.epa.gov/coral-reefs/what-epa-doing-protect-coral-reefs

# Other News

## Assessment of Chemical Contaminants in Sediments and Biota from Cocos Lagoon, Guam

This National Oceanic and Atmospheric Administration (NOAA) National Centers for Coastal Ocean Science (NCCOS) research project, funded by the NOAA's Coral Reef Conservation Program (CRCP), began in May 2015 and is ongoing. The goal of this project is to quantify the extent of chemical contamination in sediments and fish in Cocos Lagoon, Guam. Significant chemical contaminant issues have been identified in the area of Cocos Island, as a result of past land use activities. The project is providing an assessment of the spatial distribution of a suite of both organic and inorganic chemical contaminants in sediments, as well as contaminant body burdens in fish.


The island of Guam, Figure 1 from the *Assessment of Chemical Contaminants in Sediments and Biota from Cocos Lagoon, Guam*, Technical Memorandum NOS NCCOS 235. *(Photo courtesy of NOAA)*

### Why NCCOS Cares

Cocos Lagoon (see Figure 1 from NCCOS' technical memorandum) is an atoll-like coral reef lagoon located on the southwestern coast of the island of Guam. The lagoon is separated from the open ocean by a series of fringing

reefs and barrier islands, of which Cocos Island is the largest. Cocos Lagoon is a popular area for recreational activities including fishing, boating and diving, along with subsistence fishing.

Between 1944 and 1963, the U.S. Coast Guard (USCG) operated a Long Range Navigation (LORAN) station on Cocos Island. Components from the LORAN station, including several transformers and capacitors containing PCBs, likely used in the operation of the station were found on land and in nearby waters. The USCG has since removed the PCB containing transformers and capacitors, along with a substantial amount of contaminated soil, but there is evidence that these chemicals have migrated into several marine matrices including fish and nearshore sediments. This is of concern to local managers and to the public. Exposure to PCBs has been found to elicit a range of toxic responses in animal studies including reduced growth, reproductive impairment, and vertebral abnormalities. PCBs may also cause cancer in animals. A fish consumption advisory was put in place in Cocos Lagoon in 2006, following detection of PCBs in fish through USCG-funded research. In 2015, local resource managers asked NCCOS for help in assessing chemical contaminants in sediments and fish to understand the extent of the contamination throughout Cocos Lagoon.

The analysis of samples from Cocos Lagoon is being conducted through the National Status and Trends (NS&T) Program. Since 1984, NOAA has maintained the NS&T Program, a nationwide long-term monitoring program that measures the spatial distribution, temporal (historical) trends, and effects of chemical contamination in U.S. coastal waters. The NS&T Program is located within the Monitoring and Assessment Branch of NCCOS' Stressor Detection and Impacts Division. Results from the work in Cocos Lagoon will be compared with other data collected from the nation's coastal areas over the last 30 years as well as with established guidelines.

## NCCOS Partners

For this project, NCCOS worked closely with the Guam Environmental Protection Agency (Guam EPA), Guam Department of Agriculture, the University of Guam, and a local fisher, to design the sampling strategy and collect the samples from Cocos Lagoon. NCCOS also worked with NOAA National Marine Fisheries Service (NMFS) and CRCP scientists on Guam, in the planning and in the field effort. In addition to working with the partners in the design of the project, Guam EPA provided vessels and personnel for the fieldwork.


One of the Guam EPA vessels used to sample Cocos Lagoon. *(Image courtesy of NOAA)*

## What NCCOS Did

For this project, NCCOS collected sediment samples (25 total) and samples of eight species of fish (27 total) representative of those that are locally eaten. Fish were collected using a cast net or hook and line. Sediment and fish tissue (whole fish) samples were analyzed for approximately 190 chemical contaminants, including 83 PCBs, petroleum hydrocarbons, heavy metals, and several pesticides such as DDT (dichlorodiphenyltrichloethane). The

contaminant analysis protocols were developed by NOAA's NS&T Program, and have been used to monitor the health of the nation's coastal waters for over 30 years. Concentrations of chemical contaminants detected in sediments were compared to NOAA sediment quality guidelines. Concentrations of contaminants in the fish were compared with human health screening values (SV) developed by EPA. Risk as defined by EPA is one excess cancer case per 100,000 individuals that results from consumption of fish contaminated with PCBs over a 70-year lifetime. When SV are exceeded, more intensive site-specific studies are needed. Subsistence fisher SV are lower than recreational fishers. Subsistence fishers consume fish at a higher rate, and therefore would potentially accumulate higher amounts of the PCBs over time.

## What NCCOS Found

Sediments. Concentrations of chemical contaminants in sediments were low. One sediment sample near Cocos Island slightly exceeded a sediment quality guideline established by NOAA for the banned pesticide DDT. The sediments that occur throughout most of Cocos Lagoon consist of sand and coral gravel, which do not readily accumulate organic chemical contaminants.

Fish. Concentrations of total PCBs (sum of the 83 PCBs measured) were above EPA SV for some of the fish caught in Cocos Lagoon. Total PCB concentrations were above the EPA recreational SV in five species (banded sergeant, blackspot sergeant, convict tang, honeycomb grouper, and orange-striped emperor) from around Cocos Island. No fish from other locations in the lagoon were above the recreational PCB screening values. Four honeycomb groupers caught in other parts of Cocos Lagoon were above the subsistence SV. DDT was found at concentrations above the recreational fisher SV for two fish species, and above the subsistence SV for four other species around Cocos Island. No fish from any other areas of Cocos Lagoon were above either SV for DDT. No other chemical contaminants analyzed for this project were above available EPA SV.

## Next Steps

NOAA will continue data analysis, working with Guam EPA, the EPA, and the USCG. EPA has indicated that it will conduct further human health risk assessments using the NOAA data. A technical memorandum on the results from the collection and analysis of sediments and fish became available in late 2017 and can be found here: https://repository.library.noaa.gov/view/noaa/17261.

Funding from NOAA's CRCP has also been received for an effort to look for PCBs in the water column around Cocos Island, using a series of passive water samplers. Sediments are typically a reservoir for many chemical contaminants that can accumulate in aquatic organisms, however, the sediments collected in Cocos Lagoon, including those from around Cocos Island, contained very low levels of PCBs and other contaminants Because of this, sediments may not be the only source or medium through which contaminants are accumulating in the fish.

One possibility is that chemical contaminants like PCBs are being transported via water from Cocos Island (e.g., through surface water runoff or groundwater inputs) and then subsequently taken up by the fish. It is also possible that the fish are accumulating contaminants through the food chain, through the sediments, or perhaps through a combination of all three sources. To assess the possibility that the water column may be an important source of PCBs and other contaminants in the fish found adjacent to Cocos Island, NOAA in partnership with EPA and Guam

EPA, deployed an array of passive water samplers, known as PEDs or polyethylene devices, adjacent to Cocos Island in late September 2017. Public notification about the PEDs being deployed was released in September 2017, and it can be viewed here: ftp://ftp.nodc.noaa.gov/pub/data.nodc/coris/library/NOAA/CRCP/NOS/NCCOS/Project/31181/Pait2017_PEDs_Guam.pdf.

For more information, contact Ian Hartwell at ian.hartwell@noaa.gov, Tony Pait at tony.pait@noaa.gov, Dennis Apeti at dennis.apeti@noaa.gov, or Andrew Mason at andrew.mason@noaa.gov.

Source: https://coastalscience.noaa.gov/project/assessment-chemical-contaminants-sediments-biota-cocos-lagoon-guam/

## 2017 NOAA Science Report: First Stock Assessments of 27 Hawaii Reef and Bottom Fish Species

Giant trevally. *(Image courtesy of NOAA)*

Reef fish are an economically important fishery in the Hawaiian Islands. They serve as an important source of food for local fisherman, hold significance in Hawaiian culture, and draw tourists to coral reefs. The NOAA Pacific Islands Fisheries Science Center recently pioneered an improved stock assessment approach for 27 of the most commonly exploited coral reef species of Hawaii, including the culturally important kala or unicornfish. Previously data-poor, catch-based models that lumped whole families of species together were used to set reef fish annual catch limits. NOAA's improved approach combines observed length data, life history-based stock assessment models, and commercial and recreational catch data to calculate the current stock condition. Findings from this assessment suggest 11 out of the 27 species assessed, including the giant trevally, five species of surgeonfish, two species of goatfish, and three species of parrotfish, are experiencing overfishing. By comparing these findings to well-established sustainability guidelines NOAA scientists were able to propose options for future fisheries management.

Source: https://research.noaa.gov/DesktopModules/EasyDNNNews/DocumentDownload.ashx?portalid=0&moduleid=587&articleid=2336&documentid=20, page 26

## Fishery Population and Habitat Assessment in Puerto Rico Streams

Puerto Rico is known for its marine fisheries, but the freshwater habitats of the island also support a substantial number of relatively unknown fishes, many of which provide recreational fishery values. Thomas J. Kwak from the North Carolina State University Cooperative Fish and Wildlife Research Unit in the Department of Applied Ecology completed research to evaluate stream and river fish and habitat sampling techniques and to develop standardized sampling protocols. The researchers modeled patterns in occurrence and abundance of stream and river fish populations as related to physical habitat, water quality, riparian and watershed attributes, and river regulation. They quantified contaminant concentrations and dynamics in the stream food web, and elucidated the ecology and

migration of amphidromous fishes. Ongoing objectives of the research include sampling fishes in downstream river reaches, assessing fish age and growth techniques, and studies of fish early life history and recruitment dynamics. Findings from these objectives will be synthesized toward a better understanding of fish biology, ecology, and management. Funding for this work was provided by the Puerto Rico Department of Natural Resources.

Source: https://appliedecology.cals.ncsu.edu/nccoopunit/research/fishery-population-and-habitat-assessment-in-puerto-rico-streams/

# Recently Awarded Research

## NOAA Awards $8 Million for Coastal Resiliency Investments Across the Nation

Originally reported in 2016, and updated as recently as May 2018, NOAA Fisheries announced $8 million in recommended funding for 11 shovel-ready coastal resiliency projects in various sites across the country, including projects in Hawaii. These awards are part of NOAA's continued commitment to build resilient coastal ecosystems, communities, and economies.

"Americans who live on the coast face enormous risks when Mother Nature strikes; however, it is natural infrastructure - wetlands, marshes, floodplains, and coral reefs - that often serve as our best defense. The selected projects will restore our natural barriers and help keep people, communities, and businesses safe," said Eileen Sobeck, assistant NOAA administrator for Fisheries.

Six projects aim to restore critical wetlands, marshes, and floodplains in Massachusetts, California, Washington, and Hawaii. These will increase resiliency and offer flood protection for homes and businesses.

- The Confederated Tribes and Bands of the Yakama Nation will receive $250,000 to restore floodplain connectivity in the Teanaway Community Forest which will reduce peak flows and recharge groundwater for the nearby community and enhance streams for salmon by reducing water temperatures.

- The Nature Conservancy will receive $721,095 to support coastal habitat restoration on the Hawaiian island of O'ahu through invasive species removal, native species replanting, and traditional management practices to strengthen ecological and community resilience.

- Port Gamble S'Klallam Tribe will receive $1 million to restore the tidal connection between Kilisut Harbor and Oak Bay, Washington. This effort will provide passage for endangered juvenile salmon, and enhance cultural traditions of fishing and clam digging.

- The Redwood Community Action Agency will receive $1,091,045 in funds to support a multi-phase project to enhance Martin Slough in Northern California which will reduce flooding on surrounding public and agricultural land and improve habitat for threatened salmonids.

- The Town of Yarmouth, Massachusetts, will receive $633,044 to replace a degraded and undersized bridge on a major transportation corridor in Cape Cod and allow for restoration of the estuary to reduce flooding for property owners caused by storm surge and also improve fish passage.

Two projects focus on coral reef restoration efforts in Florida and in Hawaii to help sustain many economically important fisheries and natural barriers to storm surge.

- The Coral Reef Alliance will receive $842,782 to reduce the flow of water and levels of nutrients and sediment that reach nearshore coral reefs off West Maui. In applying best management practices, the project will increase these reefs' resilience to climate changes.

- The University of Miami will receive $521,920 to restore coral reefs across Miami Beach and Key Biscayne which will improve the resiliency of threatened staghorn and elkhorn corals to sea temperature changes.

Three projects focus on dam removals in Massachusetts and Maryland to remove unnecessary or unsafe structures and restore critical fish passage:

- American Rivers will receive $1 million to work with partners to remove the Bloede Dam (near Baltimore, Maryland) which will enhance the natural resiliency of the Patapsco River Valley and restore 65 miles of spawning habitat for herring, shad, eel, and other species.

- The Massachusetts Department of Fish and Game will receive $212,871 as part of a partnership to remove the Carver Cotton Gin Dam, which will remove a safety hazard and open 13 miles of riverine corridor for migratory fish like river herring and eel.

- The Town of Scituate, Massachusetts, will receive $192,566 to remove the Hunter Pond Dam, which will open five river miles for fish species that have been in decline for centuries, including the American eel, river herring, and rainbow smelt. Removing the dam will eliminate the potential for dam failure that would cause flooding and close a road.

These projects will be funded through Coastal Ecosystem Resiliency Grants, administered by NOAA Fisheries, which is dedicated to the development of healthy and sustainable coastal ecosystems through habitat restoration actions.

Source: https://www.fisheries.noaa.gov/media-release/noaa-awards-8-million-coastal-resiliency-investments-across-nation

# Tech and Tools

***Tech and Tools*** is a new section of the *Fish and Shellfish Program Newsletter*. It will highlight new or recent technologies and tools for fish advisories as well as those for monitoring and assessing fish, shellfish, and their habitat. Features will showcase apps, maps, and other innovative tools and methods.

## Alaska's Fish Tissue Monitoring Map

The Alaska Fish Monitoring Program characterizes and tracks contaminant levels from over 90 species of aquatic species from across the state. The Fish Tissue Monitoring Map shows the sampling and results of the locations of the fish tested.

View the map here: http://dec.alaska.gov/eh/vet/fish-monitoring-program/fish-monitoring-map.aspx.

# Recent Publications

## Journal Articles

The list below provides a selection of research articles focusing on Hawaii, the U.S. Territories, and reefs.

- Spatial distribution of sewage pollution on a Hawaiian coral reef
  Abaya, L.M., T.N. Wiegner, J.P. Beets, S.L. Colbert, K.M. Carlson, and K.L. Kramer. 2018. Spatial distribution of sewage pollution on a Hawaiian coral reef. *Marine Pollution Bulletin* 130: 335-347.

- Contaminants in tropical island streams and their biota
  Buttermore, E.N., W.G. Cope, T.J. Kwak, P.B. Cooney, D. Shea, and P.R. Lazaro. 2018. Contaminants in tropical island streams and their biota. *Environmental Research* 161: 615-623.

- Follow that fish: Uncovering the hidden blue economy in coral reef fisheries
  Grafeld, S., K.L.L. Oleson, L. Teneva, and J.N. Kittinger. 2017. Follow that fish: Uncovering the hidden blue economy in coral reef fisheries. *PLoS ONE* 12(8): e0182104.

- Small-scale fisheries under climate change in the Pacific Islands region
  Hanich, Q., C.C.C. Wabnitz, Y. Ota, M. Amos, C. Donato-Hunt, and A. Hunt. 2018. Small-scale fisheries under climate change in the Pacific Islands region. *Marine Policy* 88: 279-284.

- Abundance of commercially important reef fish indicates different levels of over-exploitation across shelves of the U.S. Virgin Islands
  Kadison, E., M. Brandt, R. Nemeth, J. Martens, J. Blondeau, and T. Smith. 2017. Abundance of commercially important reef fish indicates different levels of over-exploitation across shelves of the U.S. Virgin Islands. *PLoS ONE* 12(7): e0180063.

- Pilot surveys to improve monitoring of marine recreational fisheries in Hawai'i
  Ma, H., T.K. Ogawa, T.R. Sminkey, F.J. Breidt, V.M. Lesser, J.D. Opsomer, J.R. Foster, and D.A. Van Voorhees. 2018. Pilot surveys to improve monitoring of marine recreational fisheries in Hawai'i. *Fisheries Research* 204: 197-208.

- Large-scale climatic effects on traditional Hawaiian fishpond aquaculture
  McCoy, D., M.A. McManus, K. Kotubetey, A.H., Kawelo, C. Young, B. D'Andrea, K.C. Ruttenberg, and R.A. Alegado. 2017. Large-scale climatic effects on traditional Hawaiian fishpond aquaculture. *PLoS One* 12(11): e0187951.

- Estimating nearshore coral reef-associated fisheries production from the main Hawaiian Islands
  McCoy, K.S., I.D. Williams, A.M. Friedlander, H. Ma, L. Teneva, and J.N. Kittinger. 2018. Estimating nearshore coral reef-associated fisheries production from the main Hawaiian Islands. *PLoS ONE* 13(4): e0195840.

- Mercury bioaccumulation in offshore reef fishes from waters of the Southeastern USA
  Sinkus, W., V. Shervette, J. Ballenger, L.A. Reed, C. Plante, and B. White. 2017. Mercury bioaccumulation in offshore reef fishes from waters of the Southeastern USA. *Environmental Pollution* 228: 222-233.

- Linking ecosystem service supply to stakeholder concerns on both land and sea: An example from Guánica Bay watershed, Puerto Rico
  Smith, A., S.H. Yee, M. Russell, J. Awkerman, and W.S. Fisher. 2017. Linking ecosystem service supply to stakeholder concerns on both land and sea: An example from Guánica Bay watershed, Puerto Rico. *Ecological Indicators* 74: 371-383.

# Upcoming Meetings and Conferences

**148th Annual Meeting of the American Fisheries Society - Communicating the Science of Fisheries to Diverse Audiences**
August 19-23, 2018
Atlantic City, New Jersey

**72nd Annual Pacific Coast Shellfish Growers Association Shellfish Conference and Tradeshow**
September 18-20, 2018
Blaine, Washington

**Organization of Fish and Wildlife Information Managers Annual Conference and Business Meeting**
November 4-8, 2018
Hood River, Oregon

**9th International Conference on Fisheries and Aquaculture**
September 17-18, 2018
Vancouver, British Columbia, Canada

**18th International Conference on Harmful Algae**
October 21-26, 2018
Nantes, France

**Fish Passage 2018 - International Conference on River Connectivity**
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).