Testimony of
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Good morning Chairmen Whitehouse and Cardin, Ranking Members Barrasso and Crapo, and other members of the Subcommittees. I am Nancy Stoner, Deputy Assistant Administrator of the Office of Water, U.S. Environmental Protection Agency (EPA). With me today is Jim Jones, Deputy Assistant Administrator of the Office of Chemical Safety and Pollution Prevention. We thank you for the opportunity to speak with you today about EPA's role in protecting ocean health.

I would like to address both of the Subcommittee's areas of focus - ocean acidification and persistent bioaccumulative toxic (PBT) chemicals in the oceans- and then both of us are available to answer your questions.

We know that both of today's subjects of ocean acidification and persistent bioaccumulative toxics in the oceans adversely affect the marine environment. In its new report on *Ocean Acidification: A National Strategy to Meet the Challenges of a*

Changing Ocean[1], the National Research Council of the National Academies reported that ocean chemistry is changing at an unprecedented rate and magnitude due to human-made carbon dioxide ($CO_{2)}$ emissions, and that there will be "ecological winners and losers." The Interacademy Panel on International Issues, in a statement endorsed by the U.S. National Academy of Sciences, notes that ocean acidification is a "direct and real consequence of increasing atmospheric CO_2 concentrations, is already having an effect at current concentrations, and is likely to cause grave harm to important marine ecosystems." But, as outlined in the National Research Council's report, we don't yet fully understand the specifics of all the possible impacts of ocean acidification to marine organisms and seawater composition, the scope of which organisms are affected, what the effects mean, and what actions might help to prevent, abate, or control them.

Similarly, we know that toxics adversely affect the water, sediments, and living organisms of the marine environment. But we don't yet fully understand how many chemicals--individually or collectively--affect organisms or ecosystems, or how the degraded or metabolized products of those pollutants affect the same. We recently realized that even trace amounts of certain emerging contaminants of concern can have harmful effects.[2] We know that toxics reach the marine environment both directly

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[1] Ocean Acidification: A National Strategy to Meet the Challenges of a Changing Ocean. Committee on the Development of an Integrated Science Strategy for Ocean Acidification Monitoring, Research, and Impacts Assessment; National Research Council. National Academies Press. ISBN: 978-0-309-15359-1. 2010.

[2] "Persistent Organic Pollutants and Stable Isotopes in Biopsy Samples (2004/2006) from Southern Resident Killer Whales", Margaret M. Krahn *et.al*., National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Seattle; Cascadia Research; Fisheries and Oceans Canada (Pacific Biological Station); and Institute of Ocean Sciences, *Marine Pollution Bulletin*, 54(12), pp.1903-1911.
http://www.sciencedirect.com/science/article/B6V6N-4PVY331-1/2/37040056754545c70d03b06c62f47e28

through point sources, such as spills or urban stormwater discharges, or indirectly, through nonpoint sources including legacy pollutants, such as Polychlorinated Biphenyls (PCBs) that survive in sediments or atmospheric volatilization or deposition.

We have many questions left to answer in both of the subject areas of today's hearing. I would like to share with you examples of EPA activities that help us understand and address these challenges.

Ocean Acidification

Ocean acidification refers to the decrease in pH of the Earth's oceans caused by the absorption of carbon dioxide (CO_2) from the atmosphere. This is sometimes referred to as "the other CO_2 problem" with reference to climate change. However, ocean acidification is not a climate process, Ocean chemistry is directly affected as seawater absorbs CO_2 from the atmosphere. Other human activities also affect seawater chemistry, but not nearly to the extent of atmospheric CO_2-driven acidification.[3] We are only beginning to understand specifically how acidification is affecting our oceans and the life of our ecosystems, and to lay the scientific groundwork for possible actions to prevent, abate, or control such effects.

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[3] Caldeira, K.; Wickett, M.E. (2003). "Anthropogenic carbon and ocean pH". *Nature* **425** (6956): 365–365. doi:10.1038/425365a. http://pangea.stanford.edu/research/Oceans/GES205/Caldeira_Science_Anthropogenic%20Carbon%20and%20ocean%20pH.pdf

EPA already is taking action to regulate and control the root cause of ocean acidification: fossil fuel CO_2 emissions that also are the main driver of climate change.[4] As you are aware, EPA recently concluded under §202(a) of the Clean Air Act that these greenhouse gases endanger the public health and welfare of current and future generations. EPA and the Department of Transportation are embarking on a national program to substantially reduce greenhouse gas emissions from mobile sources by requiring better fuel economy for new cars and trucks sold in the United States.

Serious implications for ocean and coastal marine ecosystems. Research over the last 10 years indicates that the implications of CO_2 for ocean and coastal marine ecosystems are potentially very serious.[5] The ocean has a large capacity to absorb carbon dioxide from the atmosphere. However, we have only recently recognized that the resulting lowered pH levels in ocean waters can have serious cascading effects.[6] Ocean acidification reduces the availability of calcium carbonate in the oceans. Marine calcifiers, including corals and shellfish, depend on calcium carbonate to produce their shells, skeletons, and other protective structures, and on saturating concentrations of carbonate ions to maintain their structures. Ocean acidification can reduce the ability of organisms to create such structures and increase dissolution of them. By diverting

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[4] Doney, S.; Fabry, V.; Feely, R. & Kleypas, J.Ocean acidification: the other CO2 problem *Annual Review of Marine Science,* 2009*, 1*, 169-192
http://ic.ucsc.edu/~acr/eart254/Doneyetal2009.pdf

[5] Guinotte, J. & Fabry, V. Ocean acidification and its potential effects on marine ecosystems *Annals of the New York Academy of Sciences,* 2008*, 1134*, 320-342
http://www.gg.mq.edu.au/rep/websites/docs/paper.pdf

[6] Orr, J.; Fabry, V.; Aumont, O.; Bopp, L.; Doney, S.; Feely, R.; nanadesikan, A.; Gruber, N.; Ishida, A.; Joos, F. & others Anthropogenic ocean aacidification over the twenty-first century and its impact on calcifying organisms *Nature,* 2005*, 437*, 681-686
http://www.up.ethz.ch/education/biogeochem_cycles/reading_list/orr_nat_05.pdf

energy from production to maintenance of the skeleton, organisms may have less energy available for feeding, escaping predators, and reproduction, leading to decreased survival.[7] Many of these creatures form the basis of ocean food webs and provide us with extensive resources and vital ecosystem services, including filtering ocean and coastal waters.

Marine calcifiers have an important role in the food chains of nearly all oceanic ecosystems, help regulate ocean chemistry, and are an important source of biodiversity and productivity. Either directly or indirectly, they provide benefits in terms of fisheries, tourism, recreation, and shoreline protection or stabilization, thereby protecting coastal property value. Studies by the World Resources Institute have estimated that coral reefs in the Caribbean region provide ecosystem goods and services with an annual net economic value between $3.1 billion and $4.6 billion in 2000.[8] Another study supported by the National Oceanic and Atmospheric Administration in 2001 estimated that Florida reefs have a capitalized value of over $7.6 billion.[9] Evidence to date shows that ocean acidification could adversely affect these benefits. In addition, changes in ocean chemistry due to ocean acidification are likely to make marine ecosystems less resilient

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[7] Cohen, A.L., and M. Holcomb. 2009. Why corals care about ocean acidification: Uncovering the mechanism. *Oceanography* 22(4):118–127. http://darchive.mblwhoilibrary.org:8080/bitstream/handle/1912/3179/22-4_cohen.pdf?sequence=1

[8] Burke, L. & Maidens, J. Reefs at Risk in the Caribbean *World Resources Institute,* 2004 http://pdf.wri.org/reefs_caribbean_full.pdf

[9] Johns, G.; Leeworthy, V.; Bell, F. & Bonn, M. Socioeconomic study of reefs in southeast Florida *Final Report. Hazen and Sawyer and Florida State University. October,* 2001*, 19*, 2001

to further change in ocean chemistry and more vulnerable to other environmental impacts, including climate change.[10]

EPA's ocean acidification research. The Interagency Working Group on Ocean Acidification, in which EPA participates, is drafting a strategic research plan for ocean acidification, to be completed in 2011. An initial report on the plan's progress, including a summary of existing federally funded ocean acidification research and monitoring activities and their budgets, will be completed shortly. This work results from the Federal Ocean Acidification Research and Monitoring Act of 2009.

Additionally, EPA is engaged in a variety of research and monitoring efforts that contribute to our understanding of the effects of ocean acidification. We estimate our ocean acidification-related research and monitoring activities in 2009 at $2 million. This includes laboratory and field efforts to understand the effects on corals of ocean acidification and other stressors, such as sediment and rising seawater temperatures, which often are related to climate change. Laboratory studies are conducted in specialized coral culture facilities that hold both Pacific and Caribbean corals, in order to study tissue survival and obtain accurate growth measurements. Changes in coral survival and growth are measured under highly controlled laboratory conditions to measure consequences of single and multiple stressors. Laboratory studies are used because small changes in growth rate can be measured over short exposure periods

[10] Hoegh-Guldberg, O.; Mumby, P.; Hooten, A.; Steneck, R.; Greenfield, P.; Gomez, E.; Harvell, C.; Sale, P.; Edwards, A.; Caldeira, K. & others Coral reefs under rapid climate change and ocean acidification *science, AAAS,* 2007*, 318*, 1737 http://media.eurekalert.org/aaasnewsroom/2008/FIL_000000000120/HoeghGuldberg%20et%20al.%202007%20complete.pdf

using methods that are not readily adaptable to the. Field studies have focused on the Caribbean Sea and Western Atlantic Ocean, where reef declines appear to be greater than in any other area of the world.[11] In a collaborative effort with resource managers and scientists from Puerto Rico, the U.S. Virgin Islands and Florida, we have surveyed coral condition and identified coral reef measurements, or indicators, that are sensitive to human-generated stresses. These indicators are different than traditional coral reef measurements because they are able to distinguish effects of human activity from natural change. Using these indicators and probabilistic sampling designs specifically developed for large regional assessments, we are able to provide a monitoring approach that addresses CWA reporting and regulatory needs as well as future development of biological criteria. EPA recently completed a regional assessment of coral reefs in the U.S. Virgin Islands, which can serve as the basis for interpreting future gains or losses in coral condition relative to ocean acidification and other environmental stresses.

In addition, we are working to improve our understanding of reef services. We want to ensure that all relevant coral reef services, including recreation, tourism, fisheries, shoreline protection, marine natural products and ecological integrity, are being valued with the best available methods. EPA is preparing a "state of the science" summary of peer-reviewed literature to characterize which reef services have already been measured and how the services were quantified and valued. Filling any gaps will lead to improved measurements in reef assessments--measurements that will better describe

[11] Mora, C., 2008. A clear human footprint in the coral reefs of the Caribbean. Proceedings of the Royal Society B 275, 767–773.; Gardner, T.A., I..M . Cote, J.G. Gill, A. Grant, and A.R. Watkinson. 2003. Long-term region-wide declines in Caribbean corals. Science 301 (5635):958-960.

gains and losses in benefits we receive from coral reef ecosystems. A related effort EPA is undertaking will include consideration of the impacts of ocean acidification in our studies of the impacts of CO_2 emissions. Thus far, estimates of the benefits from reducing CO2 emissions have focused on climate-related impacts. EPA researchers are engaged in a modeling exercise that will also account for ocean acidification impacts when evaluating those benefits.

A Coral Mortality and Bleaching Output (COMBO) Model[12] is one product of our research. This computer program models the effects of climate change and ocean acidification on coral reefs at local-to-regional scales. COMBO projects impacts to coral reefs from CO2 concentrations and from periodic high temperature bleaching events. Coral bleaching, which is a sign of corals responding to stress, can be caused by a number of factors, including ocean acidification and other changes in water chemistry. Coral reefs located in Hawaii and the US Virgin Islands were tested to determine the relative importance of stressors and enabled the identification of priority areas for reef conservation.

Ocean acidification and the Clean Water Act. EPA has used Section 304(a)(2) of the Clean Water Act to develop new information relating to ocean acidification. Using data collected on EPA's Ocean Survey Vessel, the *Bold*, EPA published a reef assessment method ("Stony Coral Rapid Bioassessment Protocol," July 2007) for assessing the

[12] Buddemeier, R.; Jokiel, P.; Zimmerman, K.; Lane, D.; Carey, J.; Bohling, G. & Martinich, J. A modeling tool to evaluate regional coral reef responses to changes in climate and ocean chemistry *Limnol. Oceanogr.: Methods,* 2008*, 6*, 395-411

health and condition of stony corals.[13] In addition, EPA is developing a Technical Support Document "Coral Reef Biological Criteria: Using the Clean Water Act to Protect a National Treasure". The latter document will inform coral reef managers of a framework for developing coral reef biocriteria as water quality standards under the Clean Water Act in order to strengthen protection of coral reefs.

EPA recently published a Federal Register notice seeking comments on how to address ocean acidification under the Clean Water Act Section 303(d) impaired waters program, including whether EPA should issue guidance regarding the listing of waters as threatened or impaired for ocean acidification, and what that potential guidance might entail.[14] In addition, EPA requested information regarding recommendations for Total Maximum Daily Load development for waters impaired by ocean acidification. EPA will complete a memorandum by November 15, 2010, that describes how the Agency will approach ocean acidification under the 303(d) program.

After reviewing a wide range of information received in response to a "Notice of Data Availability",[15] EPA recently decided against revising the marine pH criterion for aquatic life under section 304(a) of the Clean Water Act at this time.[16] In most coastal regions, the data that are available to characterize diurnal and seasonal variability are so limited that short term trends in carbon system parameters and pH cannot be determined.

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[13] Link to "Stony Coral Rapid Bioassessment Protocol"
http://www.epa.gov/bioiweb1/pdf/EPA-600-R-06-167StonyCoralRBP.pdf

[14] http://edocket.access.gpo.gov/2010/pdf/2010-6239.pdf

[15] http://www.epa.gov/fedrgstr/EPA-WATER/2009/April/Day-15/w8638.htm

[16] This decision was transmitted in a letter from EPA to the Center for Biological Diversity.

Consequently, without additional monitoring, it would be difficult at this time to establish a national water quality criterion that accurately reflects the impacts of ocean acidification on coastal waters within the 3-mile statutory limit where water quality standards for states, tribes and territories are implemented.

Persistent Bioaccumulative Toxic Chemicals in the Marine Environment

In conjunction with natural toxins, human-made chemicals have become an accepted and significant part of the modern world. They're in what we eat, what we drink, what we touch, and what we breathe. In fact, traces of many such man-made chemicals can be found in the umbilical cords of almost every baby born today. As is true of ocean acidification, our understanding of toxics and their effects on the marine environment is growing, however huge data gaps remain.

Persistent Bioaccumulative Toxic Chemicals (PBTs) are long-lasting substances that build up in the food chain and, at certain exposure levels, may be harmful to human health and the environment. They do not break down, so when they are released to the environment they remain, essentially unaltered, for months or years. With continued use and release, they build up in sediments and soil. Their concentrations increase as they go up the food chain from sediment, to aquatic insects, to fish, for example. It is this concentration in the food chain which, under certain circumstances, can cause adverse effects in humans, including reproductive defects, or in wildlife. Some PBTs

are also susceptible to long range transport such that adverse effects can be found far removed from their site of production or use. Combined, these properties are what make EPA concerned not only with historical PBT chemicals, such as DDT and PCBs, but also with chemicals with similar properties entering commerce today or in the future.

As part of Administrator Jackson's comprehensive effort to strengthen EPA's chemical management program and assure the safety of chemicals, EPA has released five action plans -- on phthalates, short-chain chlorinated paraffins, perflourinated chemicals (PFCs), Polybrominated diphenyl ethers (PBDEs), and Bisphenol-A (BPA), -- which outline a range of actions the agency is considering, including utilizing for the first time ever TSCA's section 5(b)(4) authority to list chemicals of concern.

Addressing Persistent Bioaccumulative and Toxic Chemicals (PBTs) Generally. Among efforts to address PBTs, EPA has adapted its standard risk assessment methodologies for pesticides to specifically address the particular needs of compounds that exhibit persistent, bioaccumulative, and toxic characteristics. These refined methods are designed to account for the unique attributes of PBT chemicals and are applied on the basis of internationally-recognized screening criteria.[17] The Agency has begun using these methods to address the potential long-term build up of these chemicals in the environment, their potential biomagnification in aquatic food webs, and their potential transport to remote regions such as the Arctic.

[17] http://epa.gov/oscpmont/sap/meetings/2008/102808_mtg.htm

A number of other activities in our TSCA chemicals program address PBTs. EPA has developed a policy statement for new chemicals that provides guidance criteria for determining persistence, bioaccumulation, and toxicity, and advises the industry about our regulatory approach, including the evaluation criteria, review process, exposure/release controls, and testing strategy for potential new PBT chemicals.[18] This policy statement made clear to submitters of new chemical notifications under TSCA that substances meeting these criteria may need to undergo testing on persistence and bioaccumulation endpoints which, if confirmed, would be followed by appropriate toxicity testing to identify ''PBT chemical substances.'' In addition, the policy statement made clear that control action under TSCA may be needed in varying degrees, based upon the level of risk concern. EPA has also developed a computerized tool, the PBT Profiler, to help evaluate whether chemicals have characteristics of persistence, bioaccumulation, and toxicity and has made this PBT Profiler available on an EPA website at www.pbtprofiler.net. Our regional office in Chicago also has a significant PBT program and our TRI program takes into account the importance or significance of PBT characteristics through lower thresholds for reporting requirements. In addition, PBTs are a major regulatory focus in the Agency's Great Lakes Water Quality Initiative, finalized in 1995.[19] All in all, the breadth of PBT actions throughout the Agency is indicative of the importance we place on protecting human health and the environment from exposure to such harmful substances.

[18] http://www.epa.gov/oppt/newchems/pubs/pbtpolcy.htm

[19] http://www.epa.gov/waterscience/standards/gli/mixingzones/

Moreover, the Agency recently completed and released five chemical action plans which outline potential steps to address chemical risks, with chemicals selected on the basis of multiple factors, including persistence, bioaccumulative, and toxic characteristics.[20] Three of the first five chemical action plans, covering polybrominated diphenyl ethers (PBDEs), longchained perfluorinated chemicals, and short-chained chlorinated paraffins, include chemicals that are known internationally for their PBT characteristics. We are moving forward to implement the actions in those plans. EPA recently made public a list of chemicals for upcoming Action Plan development and is currently considering its approach for stakeholder engagement.

International Agreements on PBTs. The global nature of many of these substances is why the Obama Administration identified the Stockholm Convention on Persistent Organic Pollutants (POPs) and the Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade as priority treaties for U.S. ratification. The United States was instrumental in negotiating both the Stockholm Convention and the Rotterdam Convention, each of which contributes in its own way to a healthier global environment and to a healthier America. The Stockholm Convention prohibits or restricts the production, use, and release of chemicals that are toxic, persist in the environment for long periods of time, bioaccumulate as they move up through the food chain, and are transported long distances in the environment, often landing far from the sources where they are released. The reduction or elimination of these POPs sources will have

[20] http://www.epa.gov/oppt/existingchemicals/pubs/ecactionpln.html

significant benefit to the United States and other countries around the world by reducing exposures that adversely affect human health and the environment.

The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (PIC) was developed to promote information exchange and informed risk-based decision-making in the global movement of hazardous chemicals and pesticides. The Convention empowers governments to make their own domestic science- and risk-based decisions in an informed manner and, with regard to listed substances, obligates Parties to ensure that such substances are not exported to Parties that have not provided their consent. Additionally, for certain substances considered banned or severely restricted in the exporting country, the agreement requires the exporting government to provide export notification to the importing government. This prior informed consent regime is particularly helpful and important to developing countries that lack the capacity to enforce their own regulatory decisions.

The POPs Protocol to the Convention on Long Range Transboundary Air Pollution (the LRTAP POPs Protocol), which is similar to the Stockholm Convention, also addresses substances that are toxic, persistent, bioaccumulative, and susceptible to long range transport. However, this Protocol is regional in nature, covering the Member States of the United Nations Economic Commission for Europe, which includes, among others, the United States, Canada, the EU, Russia, parts of the former Soviet Union, and Eastern Europe.

Although the United States is a signatory to the Stockholm and Rotterdam Conventions as well as the LRTAP POPs Protocol, it has yet to ratify them. This being the case, and although the United States has already taken some steps to address the risks posed by PBT substances generally, and specifically the risks posed by the PBT substances covered by the Conventions and Protocol, it is of utmost importance for the United States to ratify them and take the final step to establish the legislation necessary to implement these agreements. Full participation in these Conventions and this Protocol by the United States is of special importance, for example, for the people and environment of Alaska, which is impacted more than any other state by POPs transported by air and water from outside the United States. This is particularly true for Alaskan Natives, who, like many around the United States, rely heavily on traditional diets comprised of fish and wildlife. By joining with the rest of the world to phase out or reduce the use and release of these PBTs, we protect both human health and the environment, not only for ourselves, but for the rest of the world. At EPA, we take the risks posed by these substances to our environment and public health very seriously. We are internationally recognized for our sound scientific risk assessments and regulatory decision making, and other countries look to the United States to provide strong leadership in the area of chemical safety. Our actions to protect the environment are respected and often replicated in other countries across the globe. But we are hampered by our lack of implementing legislation.

As your committee considers the issue of PBTs, I would stress the importance of implementing legislation that would allow the United States to join the Stockholm Convention, the Rotterdam Convention, and the LRTAP POPs Protocol. Over the past few decades, the United States has negotiated and signed international agreements that have the goal of protecting human health and the environment from toxic chemicals, but has been unable to join these agreements due to our lack of domestic legislation. The Obama Administration believes that it is time to pursue U.S. ratification and full implementation of these agreements.

Reforming TSCA. The Toxic Substances Control Act (TSCA) was signed into law in 1976 and was intended to provide protection of health and the environment against risks posed by chemicals in commerce. However, when TSCA was enacted, it authorized manufacture and use, without evaluation, of all chemicals that were produced for commercial purposes at that time. As a result of the legal hurdles and procedural requirements that TSCA places on EPA prior to collecting data, there are large, troubling gaps in the available data and state of knowledge about many widely used chemicals in commerce. Although there is a review process for new chemicals being introduced into commerce, chemical producers are not required to provide, without further action from EPA, the data necessary to fully assess a chemical's potential risks.

In the cases where EPA has adequate data on a chemical, and wants to protect the public against well-known risks to human health and the environment, there are legal

hurdles that prevent quick and effective regulatory action. Meanwhile, the public may be exposed to chemicals for which we have little understanding of the consequences.

Accordingly, the Administration believes it is important to work together with Congress and all interested stakeholders to quickly modernize and strengthen the tools available in TSCA to increase confidence that chemicals used in commerce, which are vital to our Nation's economy, are safe and do not endanger the public health and welfare of consumers, workers, and especially sensitive sub-populations such as children, or the environment. The Agency released "Essential Principles for Reform of Chemicals Management Legislation" in December to help inform efforts underway in this Congress to reauthorize and significantly strengthen the effectiveness of TSCA. These Principles present Administration goals for updated legislation that will give EPA the mechanisms and authorities to expeditiously target chemicals of concern and promptly assess and regulate new and existing chemicals. We look forward to working with Congress on updating TSCA as it moves forward.

Additional Areas of EPA Focus regarding Toxic Chemicals in the Marine Environment

Impact of Toxic Chemicals on Marine Mammals. Exposure to PBTs has been linked to a wide range of toxic effects in marine mammals. PBTs stored in dolphin blubber can be redistributed to other tissue during stress and consequent weight loss. Two endangered species of orcas in Puget Sound are among the most highly contaminated

marine mammals in the world. Their contamination levels reflect the continued presence of high levels of pollutants including PCBs, polybrominated diphenyl ethers (PBDE), and DDT in the greater Puget Sound area and the region's other marine ecosystems.[21]

Pollutants within an estuary can cascade through the food web and have indirect implications for crucial ecosystem processes. The endangered "apex predator" orcas are exposed exclusively to toxic contamination through their diet. Scientists believe that the orcas, for whom salmon are forage fish, are declining in health and reproductive capacity due to dwindling salmon populations which themselves are heavily contaminated by high levels of pollutants.

Examples of the contaminants' impacts on orcas are: impairment of reproduction by reducing hormone production; impairment of liver and thyroid function; skeletal deformities; suppression of the immune system, causing greater susceptibility to infectious disease; and promotion of tumor growth.

To support and restore intact ecosystem processes within the Puget Sound, the Puget Sound Partnership, one of the 28 National Estuary Programs, plans to support new

[21] "Persistent Organic Pollutants and Stable Isotopes in Biopsy Samples (2004/2006) from Southern Resident Killer Whales", Margaret M. Krahn *et.al*., National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Seattle; Cascadia Research; Fisheries and Oceans Canada (Pacific Biological Station); and Institute of Ocean Sciences, *Marine Pollution Bulletin*, 54(12), pp.1903-1911.
http://www.sciencedirect.com/science/article/B6V6N-4PVY331-1/2/37040056754545c70d03b06c62f47e28

research to fill critical knowledge gaps, inform development of models on food web structure, and identify stressors affecting salmon and other forage fish.[22]

Toxic Chemicals and Marine Debris. Marine debris serves as a vehicle for toxic chemicals to be introduced into coastal and ocean waters. A significant amount of the marine debris collected each year from the marine environment is plastic, such as convenience containers, plastic bottles, plastic bags, and plastic pellets.[23] Plastic can accumulate and concentrate toxic chemicals in the marine environment, serving as a source and a transport medium for toxic chemicals in the food chain. EPA's Marine Debris Prevention Program[24] is working to prevent debris from entering the marine environment and is beginning to explore the relationship between marine debris and toxic chemicals.

National Coastal Assessment Program. The National Coastal Assessment Program collects estuarine and coastal data from hundreds of stations along the coasts of the continental United States to assess coastal conditions. The assessment focuses on five indices of condition: water quality**,** sediment quality, benthic community condition, coastal habitat loss, and fish tissue contaminants. Toxic chemicals are included in the sediment quality and fish tissue contaminants indices, and are indirectly associated with the benthic community condition index. Results of these monitoring efforts are

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[22] *Final Results from the 2007-2009 Puget Sound Conservation and Recovery Plan, July 1, 2007 - June 30, 2009*; http://www.psp.wa.gov/downloads/SOS09/PSPlanResults.pdf , and *Ecosystem Status & Trends; A 2009 Supplement to State of the Sound Reporting, November 2009* http://www.psp.wa.gov/downloads/2009_tech_memos/Ecosystem_status_and_trends_tech_memo_2009_06_11_FINAL.pdf

[23] http://www.epa.gov/owow/oceans/debris/prevention/plastics.html

[24] http://www.epa.gov/owow/oceans/debris/prevention/index.html

presented in the National Coastal Condition Report series, which rates the ecological condition of the coasts as good, fair, and poor based on the five indices.[25]

The National Coastal Condition Report III, released in December, 2008, rates the overall condition of the nation's sediment toxicity as good, with 4% of the U.S. coastal area rated as poor.[26] The sediment contaminants component indicator, which includes PBTs, was rated overall as good. Poor sediment contaminant condition was observed in 3% of the coastal area, and fair condition was observed in an additional 5% of the area. PBT concentrations in fish tissue were also assessed, with 18% percent of all stations where fish were caught showing contaminant concentrations above EPA Advisory Guidance values. These areas were dominated by fish that had elevated concentrations of total PCBs, total DDT, and mercury. Significant regional variation was also observed.

Toxic Chemicals in Vessel Discharges. Pollution from vessels can also have serious impacts on ocean health. Pollution from recreational, commercial, and military vessels emanates from a variety of discharges, including gray water, bilgewater, sewage, ballast water, and anti-fouling paints. These discharges can include metals such as copper, zinc and lead, aromatic organic compounds such as benzene and phthalate, and other toxic chemicals. EPA is implementing existing requirements and developing new

[25] http://www.epa.gov/owow/oceans/nccr

[26] http://www.epa.gov/owow/oceans/nccr3/downloads.html

requirements under the Clean Water Act to address the discharge of harmful substances from vessels.

Toxic Chemicals and Ocean Dumping. EPA prevents toxic chemicals from entering ocean and coastal waters through implementation of the Marine Protection, Research and Sanctuaries Act (MPRSA). MPRSA prohibits the ocean dumping of harmful materials that would unreasonably degrade or endanger human health and the environment. Sediments dredged from our ports and harbors to maintain navigation are one of the more significant materials disposed into the ocean under the authority of MPRSA. Sediments can contain a wide range of organic and inorganic contaminants, such as heavy metals, polyaromatic hydrocarbons and PCBs. Working closely with the Army Corps of Engineers, EPA requires testing of all dredged materials proposed for ocean dumping to determine whether they meet EPA's environmental criteria. This testing process is designed to protect against toxicity and bioaccumulation that may adversely impact the marine environment. In addition, EPA designates and monitors ocean dumpsites using the Ocean Survey Vessel *Bold* to ensure proper placement and disposal of dredged materials, further preventing adverse impact to the marine environment.

Thank you for the opportunity to describe EPA's role in protecting ocean health. We would be happy to answer any questions you may have at this time.