From Research to Action: Responding to Plastic Pollution through Science International Summit on Plastic Pollution

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Keynote Address: A Cleaner Ocean

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Good morning.

Three basic facts bring us together. Humanity now manufactures about 50 kilograms, or 110 pounds, of plastics every year for each of the 8 billion of us on Earth. Second, much of this ends up carelessly disposed in the oceans.   Third, plastics are such brilliant materials for transport and storage of goods that large-scale substitution of alternatives will be hard. In sum, we know we are manufacturing a planetary risk, though we have little idea of the actual harm so far, nor the costs of amelioration.

Thus, thanks to the Embassy of France, Global Council for Science and the Environment, and Long Island University for organizing this timely Summit. Particular thanks to the members of the Steering Committee, and to Stephane Raud, Michelle Wyman, Kimberly Cline, Randy Burd, and Alan Gertler. Thanks to all the participants, both in-person and virtual, especially to the elected officials of both France and the US who build their competence on the plastics question and contribute their experience in problem-solving.

I have the privilege to open the meeting as the Chair of the Richard Lounsbery Foundation, one of the sponsors, and also as a marine scientist.

Let me first speak on behalf of Lounsbery, a small philanthropic foundation active mainly in basic science. Happily, Lounsbery's mission includes encouragement of scholarly cooperation between the USA and France. About a year ago, Lounsbery welcomed an excellent proposal prepared under the leadership of Dr. Fabienne LaGarde of Université Le Mans. The proposal

aimed to lift French-American cooperation with regard to marine plastics, and the Foundation is thrilled that the scope of the project has grown to the scale of this Summit.

Although Lounsbery is small and in general chooses a low profile, we are proud of the people, projects, and organizations we support in ocean science, French-American cooperation, and marine debris studies. Let me mention a few of the activities.

In ocean sciences broadly, Lounsbery provided germinal funding for the [Partnership for the Observation of the Global Oceans](#), the [Ocean Biodiversity Information System](#), and the [Deep-Sea Biology Society](#). We also helped initiate the [International Quiet Ocean Experiment](#) and very recently the [Global Library of Underwater Biological Sounds](#). French ocean science ventures have included early support for the documentary film [Oceans](#), produced by Jacques Perrin. In fact, Lounsbery has supported several efforts of Jacques Perrin about nature, including we hope a new one about the landscape of the American West. Lounsbery has also supported several expeditions of the Paris Natural History Museum led by Philippe Bouchet, to Corsica, Madagascar, New Caledonia, and the Caribbean.

With regard to marine debrise, Lounsbery is a supporter of [SCOR Working Group 153](#), Floating Litter and its Oceanic TranSport Analysis and Modelling (FLOTSAM). I expect that several participants in this Summit also contribute to the SCOR group.

More recently, Lounsbery has supported the West African [COLLECT project](#) – Citizen Observation of Local Litter in Coastal ECosysTems, involving sampling campaigns in Ghana, Nigeria, Benin, Cote d'Ivoire, Morocco and Cabo Verde.

Let me briefly speak now also about my personal involvement in the [UN Decade of Oceans Science (UNDOS) for Sustainable Development](#). Since late 2019, I have served as a member of the Clean Ocean Expert Group of the UNDOS co-chaired by Angelika Brandt (Germany) and Elva Escobar Briones (Mexico).

On 17 November 2021 our Expert Group issued a [Manifesto for Clean Ocean 2030](#). Our Manifesto aimed to increase circularity of the economy in the face of increasing industrialization of the oceans and promote mobilization to manage ocean pollution at its sources in ways that enable both a profitable [Blue Economy](#) and a Clean Ocean.

We considered the many forms of pollution that threaten or already dirty the ocean:

- Debris, including plastics

- Oil and chemical spills and releases from seafloor extraction, pipelines, and shipping

- Runoff of fertilizers, pesticides, and other chemicals from agriculture and both rural and suburban areas

- Sewage and other coastal runoff, including pharmaceuticals, from urban areas and harbors, and associated harmful algal blooms

- Contaminants that, although settled in sediments, can be remobilized by disturbances

- Sewage and other improperly discarded wastes from vessels

- Acute and chronic elevation of noise and light

- Radiation from radioactive materials deposited or discharged into the oceans

- Invasive species and other harmful aspects of bilge and ballast water carelessly released

- Construction debris from platform and island building, spoils from channel dredging and pipe-laying, and derelict facilities

- Abandoned and discarded equipment from ocean navigation and research and military activities

We considered threats to a Clean Ocean that come from land-based and atmospheric sources and from the sea itself.

- Land sources include agricultural fertilizers (causing deoxygenation or dead zones), herbicides, pesticides, fungicides, and other materials employed in the bioeconomy; micro- and macro-plastics from carelessly used and discarded products; non-metabolized medicines and other drugs from human consumption; detergents and many other chemicals that form parts of urban and industrial metabolism; heavy metals from mining; and brine from marine water desalination.

- Atmospheric sources include greenhouse gases (primarily generated on land) associated with climate change and acidification; forms of sulfur, nitrogen, mercury, and other

harmful pollutants generated both at sea and on land; noise from aviation and wind farms, and dust from anthropogenic fires.

- Sea sources include spills from extraction, transport, and use of petroleum products; ship sources of waste, including discarded fishing gear and other forms of waste; untreated wastewater from recreational and commercial vessels; deep-sea tailing placements; lubricants and other chemicals from offshore facilities; underwater noise from shipping, mining, fishing, and pile driving; and night-time illumination of vessels and fleets.

We proposed that the leadership of the Ocean Decade set not more than ten ambitious global goals for a Clean Ocean. New targets and timetables should be similar in scope and character to the already Endorsed Recommendations to protect 30% of the marine environment by 2030 and complete the high-resolution mapping of the seabed by 2030.

This process should aim to define and attract financial and other support to meet an initial set of goals for 2025, followed by goals for the end of the Ocean Decade in 2030.

Examples of Clean Ocean objectives for 2025 include

- Quantify the global harm of marine pollution from all major sources on ecosystems and organisms and on human health;

- Define a Clean Ocean, including acceptable levels of pollution to set threshold values, and define ecological boundaries or maximal levels of pollutants as well as their rates of degradation to maintain well-functioning ecosystems;

- Identify high-priority geographic challenges such as polar regions and urban coasts.

- Identify barriers to action impeding scaling up solutions for regional and global impact; quantify possibilities for amelioration.

- Develop reference scenarios for industrialization of the oceans during the next decade, including tourism, seabed mining, windfarm development, for example, as they relate to a Clean Ocean.

- Develop initial estimates of costs associated with transitions to a Clean Ocean.

- Secure major financial commitments.

In short, by 2025 the Expert Group aimed to identify potential pathways toward solutions for knowing what is manageable. By 2030 we want to achieve measurable improvement in monitoring and clear reduction of emissions and harm through a spectrum of technical and behavioral strategies.

Examples of Clean Ocean objectives for 2030

- Enlarge understanding of pathways for spread and fates of pollutants.

- Reduce and remove top-priority forms of pollution (e.g., marine debris) by large amounts, as much as 50% to 90%.

- To prevent recurrence, reduce sources or emission of pollutants (e.g., anthropogenic noise, discarded plastic and harmful chemicals, farming practices adding harmful sediment outflow).

- Improve dramatically the outcomes of control measures (e.g., to decrease amounts of mercury in tuna, die-offs of marine life, eutrophication).

- Improve monitoring (often as part of the Global Ocean Observing System [GOOS]) for more accurate, precise, timely, comprehensive real-time tracing of spills and monitoring of ocean soundscapes; improve systems to provide timely warning of pollutants emerging and increasing.

- Identify and accelerate development and adoption of technologies to promote a Clean Ocean. These could range from cleaner, more efficient motors and fuels to new forms of remediation and waste management; better ways to monitor, track, and map marine pollutants and progress toward a clean ocean (such as aerial remote sensing, genomics, and hydrophone arrays); and better technologies for emergency cleanup.

- Improve national mechanisms (legal, regulatory) for control and prevention, better align financial incentives, and lift compliance with international treaties.

- Lift public engagement and understanding with access to information associated with behavioral shifts favoring the motto of "reduce, re-use and recycle" and encourage participation in citizen science as part of events involving sailing, surfing, and other activities dependent on a Clean Ocean.

Our manifesto concludes: *Now is the time for ambitious targets and timetables to elicit the science for the Clean Ocean we want.*

Let us not despair. Let us recall that plastics first appeared on planet Earth at the start of the 20th century as a solution, not only for overuse of wood and other products of the bioeconomy, and of metals, but also as a way to increase utilization of waste materials from the processing of crude oil and natural gas.

Clearly, we need both behavioral and technical approaches, and the technical approaches must fit with human behavior. Recycling probably accounts for less than 10 percent of all plastics produced every year.

But we see signs of action, at least words about action. The global agreement adopted in 2019 by more than 180 countries aims at restricting the exporting of plastic trash from wealthy countries to poor countries. In March 2022 representatives of 175 countries agreed to begin writing a legal binding global treaty addressing growth of plastic pollution as well as its impact on climate change and biodiversity loss. In addition to improving recycling efforts and cleaning up plastics trash, the treaty aims to include curbs on production of certain plastics and on single-use plastics.

Countries are also making national and local regulations and laws, some mostly symbolic from the point of view of tonnage, but still indicators. As the Gospel of John says, in the beginning was the word.

The outstanding new report released a few weeks ago by the Back to Blue initiative of the Economist magazine and The Nippon Foundation, The Invisible Wave: Getting to zero chemical pollution in the ocean, usefully identifies three generic areas for action:

Governance: a country's mix of laws, regulation, and incentives for plastics management

Systemic capacity: a country's scope to oversee, collect, sort and recycle plastic waste, and its investment in capacity building-efforts, and

Stakeholder engagement: international and national efforts by governments to combat plastic waste, along with endeavours made by the private sector and consumers

This Summit offers a special opportunity for at least two reasons. One is the spectrum of specialties of the participants, which allows the group to address all three of these areas for actions. Second, France and the USA account for far the largest portions of the global exclusive economic zones (EEZs), more than 11 million square kilometers for each nation. France and the USA are marine superpowers. We matter very directly and by example.

In the spirit of the UN Decade of Ocean Science, may this Summit set ambitious targets for 2030 and inspire our own nations and the world to reach them.

Thank you.