

Editor's note: Diana Payne, Connecticut Sea Grant education coordinator since 1999, has been prominent in national and international efforts to advance ocean literacy as a fundamental educational concept that should be taught worldwide. As a leader in this area, she was recognized in 2021 with the National Marine Educators Association President's Award, and in May 2023 was among 20 people chosen by the United Nations Education, Science and Cultural Organization (UNESCO) for the Global Group of Experts on Ocean Literacy. In this article, Payne describes the origins, goals and achievements of the Ocean Literacy Campaign.



By Diana Payne
Photos courtesy of the National Marine Educators Association

The ocean. A vast watery highway covering more than 70% of Earth. It connects us. It makes Earth a place for life to exist. It plays a significant role in weather and climate. It is the defining feature of our planet. All life, including our own, exists because of the ocean.

But few of us learned much, if anything, about the ocean unless we chose to do so in specialized high school courses or in college. More than two decades ago, a group of passionate scientists and educators—myself among them—sought to change that.



Connecticut Sea Grant Education Coordinator Diana Payne, third from left, gathers with other participants at a recent UN Educational, Scientific and Cultural Organization (UNESCO) meeting in Venice, Italy. Photo courtesy of Diana Payne

The roots of what we now call the Ocean Literacy Campaign can be traced back to a few pivotal events.

An in-person workshop in May 2000, sponsored by the National Science Foundation (NSF), established the Centers for Ocean Sciences Education Excellence (COSEE). This was soon followed by reports from the Pew Oceans Commission in 2003 and the U.S. Commission on Ocean Policy in 2004. The reports noted that Americans knew very little about the ocean. Additionally, educators including me knew ocean science content was not part of what was then called the National Science Education Standards. We also knew that few ocean scientists were involved in education and outreach.

In the same time frame, other critical events occurred. In 2002, the National Geographic Society and the College of Exploration collaborated on the Ocean for Life program, which provided a model for convening a community of educators, scientists and others concerned about the public's lack of knowledge of the role of the ocean in their daily lives. The 2004 U.S. Commission on Ocean Policy report specifically called for increased ocean education as a critical component of ocean policy moving forward, specifically recognizing COSEE and the National Sea Grant College Program as "ocean education programs of particular importance."

The report also recognized the National Marine Educators Association (NMEA) and the National Science Teachers Association (NSTA) as "professional organizations that could build a collaborative ocean education network." The first seven COSEE centers and a national coordinating office were established in 2002, with three more centers added in 2004. Most centers included a Sea Grant partner and NMEA members. Also in 2004, the National Oceanic and Atmospheric Administration (NOAA), COSEE, the National Geographic Society, NMEA, the College of Exploration, and the Lawrence Hall of Science at the University of California

Campaign for ocean literacy works to bring marine education into classrooms and beyond



HOW INAPPROPRIATE TO CALL THIS PLANET EARTH, WHEN IT IS QUITE CLEARLY OCEAN.

—Sir Arthur C. Clarke

The Essential Principles of Ocean Literacy

- 1 Earth has one big ocean with many features.
- 2 The ocean and life in the ocean shape the features of Earth.
- 3 The ocean is a major influence on weather and climate.
- 4 The ocean makes Earth habitable.
- 5 The ocean supports a great diversity of life and ecosystems.
- 6 The ocean and humans are inextricably interconnected.
- 7 The ocean is largely unexplored.

Note: the use of the word “ocean” in Principle 1 in the singular. This is because there really is only one global ocean with several ocean basins



Berkeley convened a series of meetings to define the most important ideas people should understand about the ocean. These organizations provided the backbone support and leadership to ensure the process was as inclusive and transparent as possible, and that no one organization had or even today has ownership. The result was the seven Essential Principles and 44 (now 45) Fundamental Concepts.

In addition to the Essential Principles and Fundamental Concepts, a consensus definition of ocean literacy was created: ocean literacy is an understanding of the ocean’s influence on you and your influence on the ocean. The definition has three parts, because understanding alone does not make a person ocean literate. You must also be able to talk about the ocean with others in a meaningful way and apply what you know to making responsible decisions about the ocean and its resources.

Soon an *Ocean Literacy Guide* was created and released. Those who worked on it knew more resources needed to be developed. What is now known as the Ocean Literacy Framework came next, made up of four parts.

“Ocean literacy is an understanding of the ocean’s influence on you and your influence on the ocean.”

In addition to the *Ocean Literacy Guide*, which included definitions, essential principles and fundamental concepts, we developed a scope and sequence framework of how to conceptually build ocean learning through the grades. It was aligned with the Ocean Literacy Essential Principles and Fundamental Concepts and NGSS Disciplinary Core Ideas (the content), and the International Ocean Literacy Survey (IOLS), and translated into 17 languages. Each part of the framework was developed through collaboration, cooperation and transparency.

The newest resource is *A Handbook for*

“Each of us has a part to play in helping to foster global ocean literacy within our own communities and regions.”



A fisherman tosses a net in the waters of the South Pacific.

Increasing Ocean Literacy. This handbook updates some of the articles and tools in NMEA's *Special Report on Ocean Literacy* (now out of print) and integrated other resources developed since 2010 (e.g., the NGSS alignments). An accessible version is now available on the NMEA website. This version enables those with a visual impairment to also access the framework documents.

While we did not intend to be a model for other disciplines, within a year of the first guide being published we saw an effort launched to create a climate literacy document. Since then, the *Ocean Literacy Guide* has influenced other groups, resulting in numerous publications. Each guide includes a definition of the topic, and a small number of big ideas, supported by smaller, underlying concepts. These topics include atmospheric science, climate, Earth science, energy, estuaries, Great Lakes, Lake Erie, neurosciences, and Mediterranean Sea literacy.

The actions that became the Ocean Literacy Campaign addressed specific challenges in the United States, including a lack of ocean science content in the education system. Ocean literacy has also become a global phenomenon. Not only have there been numerous adaptations and translations of the original *Ocean Literacy Guide* into other cultures and languages, the seven Essential Principles have influenced curricula, exhibit design and common messaging and communications internationally.

In large part through international participation at NMEA conferences and collegial connections, multiple marine education organizations have developed

with a focus on ocean literacy in various regions, including the International Pacific Marine Educators Network—IPMEN (Maui 2005), European Marine Science Educators Association—EMSEA (Boston 2011), Asia Marine Educators Association—AMEA (Rhode Island 2015), CaNOE—the Canadian Network for Ocean Education—(2015) and RELATO—Latin American Education Network for the Ocean (Latin America and the Caribbean) (2019).

More recently, global efforts have begun to co-create and co-develop programs and projects to increase global ocean literacy. In 2017, UNESCO released *Ocean Literacy for All: A toolkit*. The publication connects the Ocean Literacy Essential Principles and Fundamental Concepts with UN Sustainable Development Goal No. 14: “Conserve and sustainably use the oceans, seas, and marine resources for sustainable development.” It also includes vignettes featuring perspectives of scientists on the importance of a global population that is ocean literate. The document also shares success stories and several activities aligned to Ocean Literacy Principles and UNESCO Sustainable Development goals.

The United Nations Decade of Ocean Science for Sustainable Development (Ocean Decade), led by the Intergovernmental Oceanographic Commission (IOC) of UNESCO, kicked off in January 2021. While the main focus is on scientific data collection and advancing ocean technology, ocean literacy is also a key component of Ocean Decade activities and includes a specific program—Ocean Literacy With All (OLWA). OLWA goals include: advancing ocean literacy through international partnerships and networks; designing and implementing

transformative locally and globally relevant education and research-based activities and projects by and for diverse stakeholders; and aiming toward capacity and behavior change to achieve an ocean literate society to help ensure sustainable development of the global ocean.

In May 2023, the IOC assembled a Group of Experts on Ocean Literacy. The Group of Experts will provide guidance in the scoping, implementation and monitoring of IOC/UNESCO ocean literacy activities.

“Ocean literacy is a fundamental tool to advance ocean sustainability” said Francesca Santoro, senior programme officer for ocean literacy at the IOC-UNESCO Secretariat. “The IOC/UNESCO is becoming a leading force in promoting ocean literacy across different regions and countries. We look forward to working with the Group of Experts to bring their diverse expertise together with different perspectives and approaches.”

Ocean literacy is critical to the success of the Ocean Decade and particularly Challenge 10: *Change humanity's relationship with the ocean*. Each of us has a part to play in helping to foster global ocean literacy within our own communities and regions.

RESOURCES:

Ocean literacy overview: <https://www.marine-ed.org/ocean-literacy/overview>

Ocean Literacy Essential Principles and Fundamental Concepts: https://static1.squarespace.com/static/5b4cecfde2ccd188cfed8026/t/60b90193e346816a95717bb/1622737304272/OceanLiteracy_ENG_V3.1_2021.pdf

Ocean Literacy Scope and Sequence for Grades K-12: <https://www.marine-ed.org/ocean-literacy/scope-and-sequence>

Ocean literacy alignment with NGSS: <https://www.marine-ed.org/ocean-literacy/ngss-alignment>

A Handbook for Increasing Ocean Literacy: <https://www.marine-ed.org/ocean-literacy/handbook>

