



## PACE MISSION

PACE will extend and improve NASA's 20 plus years of global satellite observations of our living ocean, atmospheric aerosols, and clouds and initiate an advanced set of climate-relevant data records. By determining the distribution of phytoplankton, PACE will help assess ocean health. It will also continue key measurements related to air quality and climate.

### Science Goals

To extend systematic ocean color, atmospheric aerosol, and cloud data records for Earth system and climate studies.

To address new and emerging science questions by detecting a broader range of color wavelengths that will provide new and unprecedented detail.

### Key Mission Characteristics

- \* Hyperspectral ocean color instrument
- \* Two multi-angle polarimeters
- \* Launch readiness date: Fall 2022
- \* 675 km (419 mi) orbital altitude
- \* Sun-synchronous, polar orbit
- \* Global coverage every two days
- \* Managed by Goddard Space Flight Center

National Aeronautics and Space Administration

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**Our ocean supports one in 45 American jobs and contributes over \$350 billion to the U.S. Gross Domestic Product (GDP) every year.**



**Ocean color observations by PACE will assist fisheries management and toxic algae bloom response.**



**PACE measurements of the ocean and atmosphere will inform water, air quality, and weather forecasts, improve national security and our understanding of Earth's climate.**



**PACE products will aid decisions makers in policy, military, commercial sectors, and the public.**

## Economy & Society

PACE will provide insight into systems that affect our everyday lives.

Plankton, Aerosol, Cloud, ocean Ecosystem

*More wavelengths.*

*Unprecedented information.*

# Economy & Society

The U.S. ocean economy contributes over \$350 billion to the GDP (based on 2014 data) and supports more than 3.1 million jobs, equivalent to 1 in 45. Currently, this ocean economy, including the Great Lakes, is growing faster than the total U.S. economy in both contributions to inflation-adjusted GDP (15.6% since 2007 compared to 5.8%) and jobs (8.1% compared to flat).

Earth's ocean teems with life, supporting economies, food security, and our everyday well-being. Key to ocean health are phytoplankton: microscopic plants and algae. These diverse organisms fuel the marine food web, reduce atmospheric carbon dioxide, and have produced half of the oxygen on Earth. On the other hand, some species are harmful and can contaminate drinking water, kill fish, or force the closure of recreational areas.

PACE will be the first mission to provide measurements that enable prediction of the "boom-bust" cycle of fisheries, the appearance



of harmful algae, and other factors that affect commercial and recreational industries. While current satellites provide essential tools for monitoring the ocean, coasts, and Great Lakes, they cannot always be used effectively to evaluate changes to fisheries or identify harmful algae.

PACE will also observe clouds and tiny airborne particles that absorb and reflect sunlight, known as aerosols. Industry, the Department of Defense, National Oceanic and Atmospheric Administration, policy makers, and scientists all rely on these key data to forecast weather, visibility, and air quality. PACE will observe the ocean, clouds, and aerosols together to better understand their interactions. Its data will reveal new details about the exchange of carbon dioxide, how some aerosols can fuel

*Without PACE, we will continue to be blind to the impacts of diversity changes in our marine resources.*

*PACE will provide observations that benefit society in ways that current satellites cannot.*

phytoplankton growth, and how phytoplankton can release particles to the atmosphere that lead to the formation of clouds. Overall, these processes affect how much heat is trapped by Earth's atmosphere and thus are vital for accurate weather and climate predictions.

For operational users, policy implementers, the commercial sector, and scientists, PACE will offer unprecedented opportunities to monitor fisheries and harmful algae, while improving our understanding of water resources, the impact of disasters, ecological forecasting, human health, and air quality.

## Example PACE user communities:

- ✦ Resource managers
- ✦ Researchers and computer modelers
- ✦ Military users and operational users
- ✦ Environmental health agencies
- ✦ Renewable energy sectors
- ✦ Educators of the general public
- ✦ Policy makers and economists

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Learn more at [pace.gsfc.nasa.gov](http://pace.gsfc.nasa.gov)

