PACE will provide a combination of atmosphere and ocean observations to benefit society in the areas of water quality, human health, fisheries management, ecological forecasting, disaster impacts, and air quality.

Users at local, state, federal and international agencies as well as the general public will be able to apply data from PACE to make more informed and robust decisions about their activities.

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: January 2024**
- **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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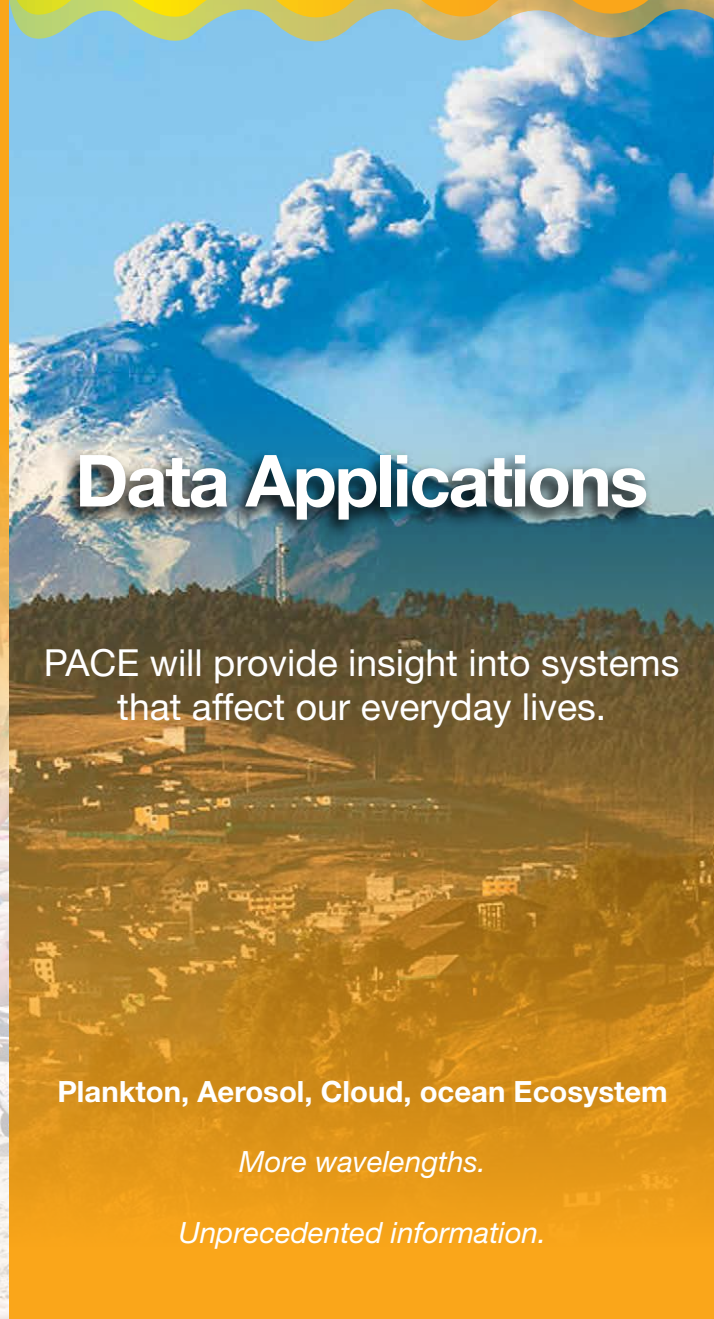
National Aeronautics and Space Administration



Data Applications

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

Plankton, Aerosol, Cloud, ocean Ecosystem

More wavelengths.

Unprecedented information.

Data Applications

With state-of-the-art technology, PACE will deliver NASA's most comprehensive look at our living ocean. Even better, these data will have higher spectral resolution than ever before. Its sensors are designed to identify the types of microscopic algae that float in our ocean, *phytoplankton*. Such information will be used to evaluate the state of our ocean's health. PACE will also carry instruments to detect the properties of clouds and small particles suspended in the atmosphere known as *aerosols*.

In addition to meeting its fundamental science goals, PACE data will be applied to vital societal issues. For example, it is important to inform the public of the impact of aerosols from air pollution or fires. In regions without ground measurements of these types, satellite data can contribute to air quality index reports.

One of nature's most spectacular "air shows," volcanoes can spew large volumes of dangerous ash into Earth's atmosphere. In April 2010,

over 100,000 commercial airline flights were canceled due to ash plumes from Iceland's Eyjafjallajökull volcano. Aerosol data from PACE – size, location, and thickness of particles – will be used to assess the safety of airline routes.

From sky to sea, PACE data will improve our everyday lives. It will map habitats that support and sustain ocean ecosystems and commercial fisheries. New details on ocean productivity will shed light on species' behavior. How? By revealing how some organisms adjust to environmental change, including adaptations in their range and life cycles.

Overall, phytoplankton provide great benefit. Dwelling near the top of our ocean – where air meets the sea – their growth helps to reduce carbon dioxide levels in the atmosphere.

PACE will fill critical data gaps in regions that lack ground-based air quality measurements.

Why do we need PACE? To improve our understanding of Earth's changing marine ecosystems.

However, some species can be harmful: killing fish, tainting seafood, and polluting our waters. Data from PACE will be used to identify harmful algal blooms (HABs) and track their evolution over time. As a result, communities will be better able to anticipate and mitigate the adverse effects of HABs.

The connected atmosphere-ocean system regulates the health of our planet, and also our own. By observing this system as a whole, PACE will inform data-driven decision making from local to global scales. Thus, applications of PACE will provide great value, equaling the impact of the mission's primary science goals.

Advanced PACE capabilities will result in new products that will help with many pressing environmental issues, including:

- **Air quality degradation**
- **Aviation safety**
- **Managing marine fisheries**
- **Harmful algal blooms**

Plankton, Aerosol, Cloud, ocean Ecosystem

Learn more at pace.gsfc.nasa.gov