The Argo Project: Global Observations for Understanding and Prediction of Climate Variability

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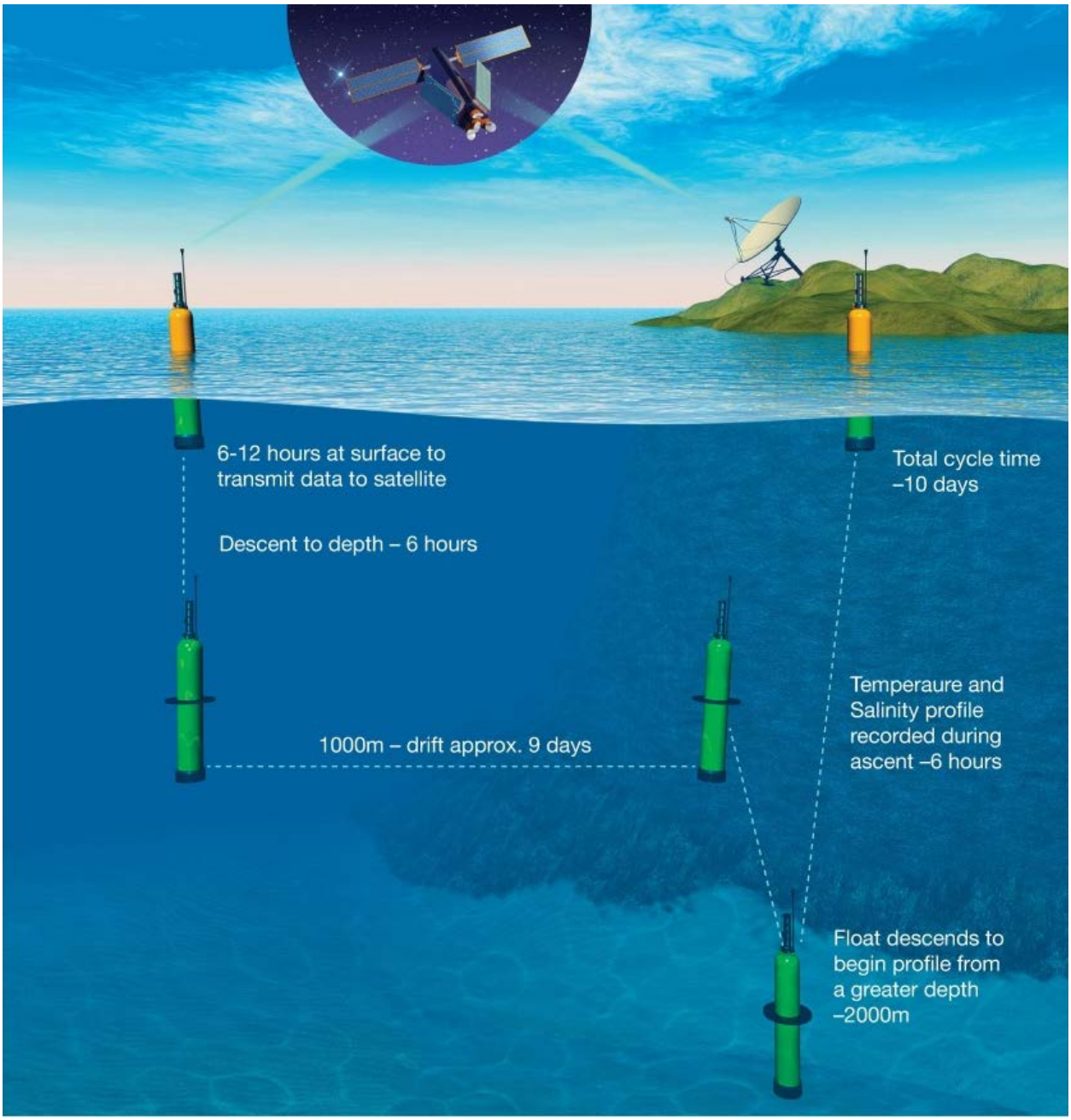
Project Summary

Broadening Knowledge of Ocean Characteristics

Argo, named after a mythological Greek ship, is an international collaborative ocean-observing program of over 3,500 drifting floats that gather approximately 120,000 temperature, salinity and depth profiles throughout the world's oceans every year. Combined with satellite observations, the information gathered by Argo floats allows ocean scientists and the public at large to better understand ocean dynamics and forecast global climate. Over fifty nations worldwide participate in the program.

The bright yellow floats drift on ocean currents descending to depths of over 6000 feet. After about 9 days submerged each float rises to the surface collecting temperature, salinity, and other information that are transmitted via satellite when the float reaches the surface. Argo provides the first ever global-scale, all-weather subsurface observations of the ocean. The Argo float network has played a key role in our understanding of ocean dynamics, ocean warming, and represents a major step forward in the ability to monitor ocean chemistry (e.g., dissolved oxygen, ocean acidity [pH]) globally, at higher frequency and lower cost.

Dana Swift (Left,University of Washington) holds an Argo Float, an autonomous, free-floating ocean device that collects a variety of data, including temperature, to over 6000 feet, every 10 days for over four years without the need of a ship once deployed (right). Each instrument weighs approximately 65 pounds.

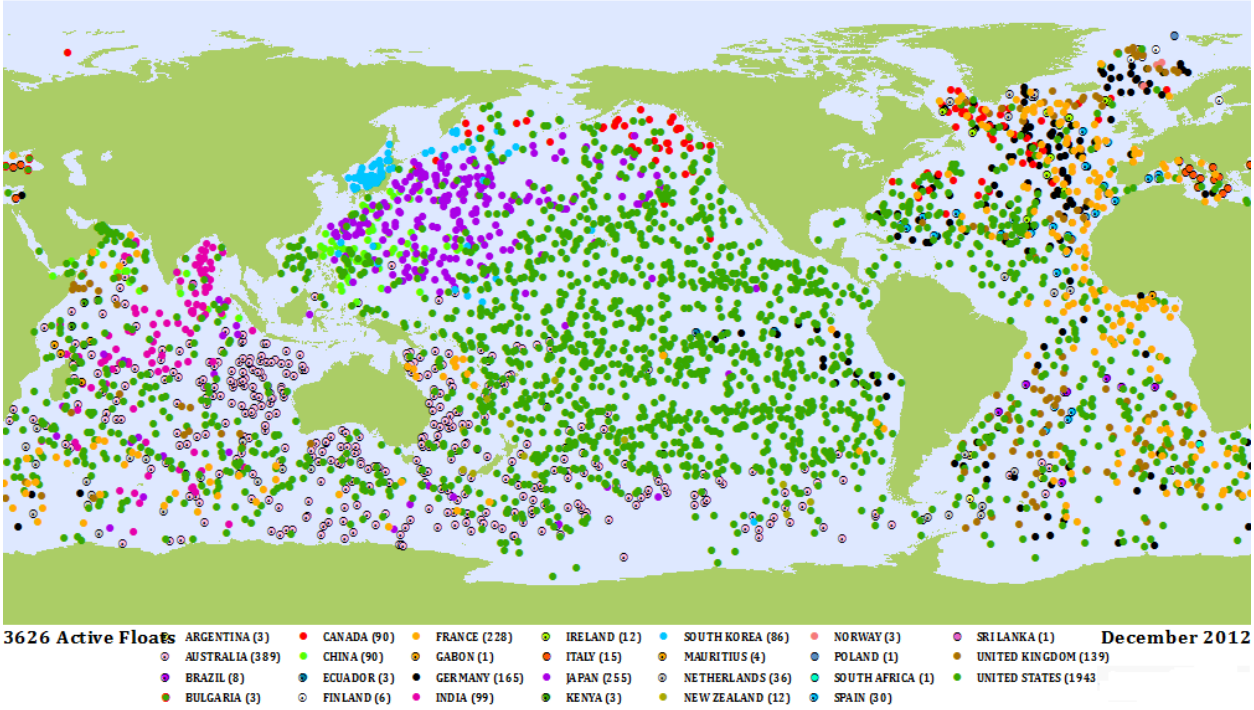


Schematic of a profiling float cycle. Upon reaching the surface at the end of a cycle, the data obtained are transmitted via satellite with most of the data being available to operational centers and researchers within twenty-four hours of collection.

Argo data are also being used in an ever-widening range of research applications that have led to new insights into how the ocean and atmosphere interact in extreme as well as normal conditions over periods from days to decades. Two examples are the processes in polar winters when the deep waters that fill most of the ocean basins are formed and, at the other temperature extreme, the transfer of heat

and water to the atmosphere beneath tropical cyclones. Both conditions are crucial to global weather and climate and could not be observed by ships.

Working with multiple partners the U.S. Argo Program provides and deploys approximately half of the floats in the global Argo array, and carries out data communications and data management for those floats. U.S. Argo contributes to ongoing float technology development, and has roles in the international coordination of Argo. The U.S. Argo Program is funded by the National Oceanic and Atmospheric Administration (NOAA) and is implemented by a partnership of five institutions: Scripps Institution of Oceanography (UCSD), the University of Washington, Woods Hole Oceanographic Institution, NOAA's Pacific Marine Environmental Laboratory, and NOAA's Atlantic Oceanographic and Meteorological Laboratory. The U.S. Navy is also a partner, providing public internet access to Argo data via one of Argo's Global Data Assembly Centers.



Status of the global array of profiling floats as of 31 December 2012