

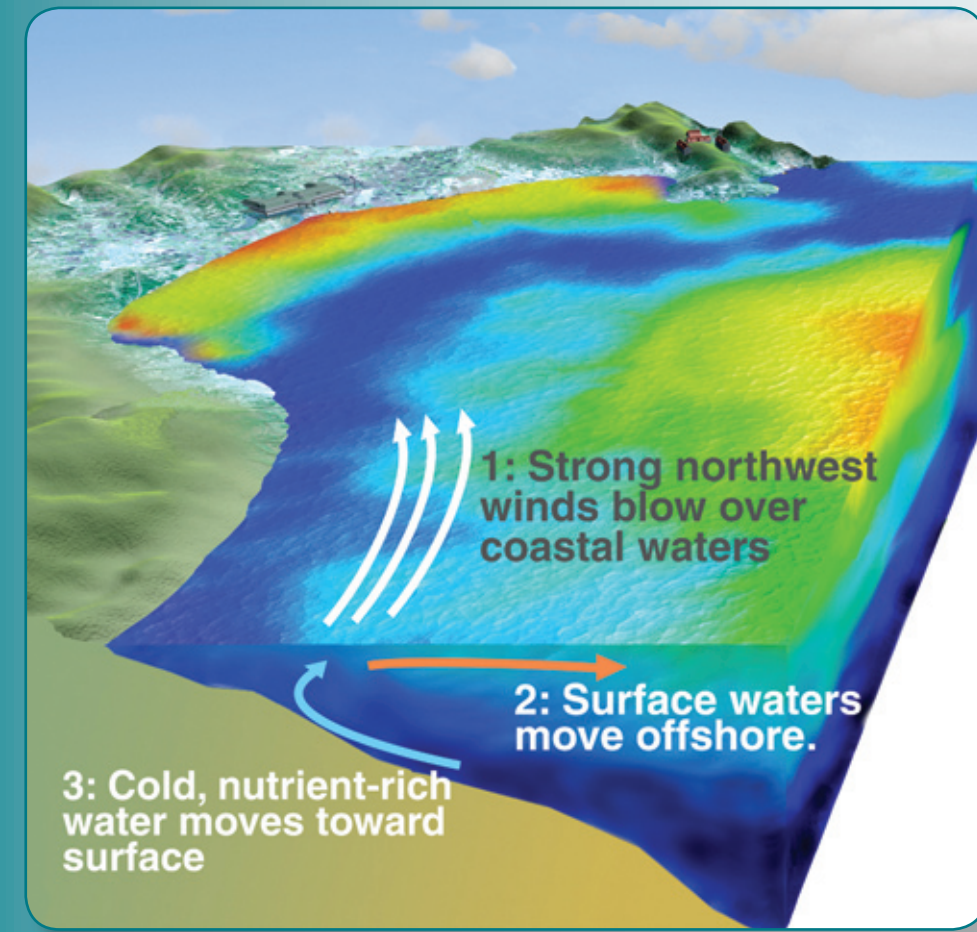
FLOWING OCEAN ... UNDERSTANDING THE CALIFORNIA CURRENT

WHAT ARE OCEAN CURRENTS?

Ocean currents transport water over vast distances, flowing in complex patterns and influenced by:

- The distribution of wind and heat over the globe
- Density differences in the ocean due to variations in temperature and salinity
- Pressure gradients caused by differences in sea level
- Earth's rotation, seafloor topography, and the shape of the continents

Upwelling as it occurs along portions of the California Coast.



The California Current (CC) is an Eastern Boundary Current (EBC), so named because it lies on the eastern side of a major ocean basin. All the EBCs flow equatorward, and are characterized by intense coastal upwelling that brings cold, nutrient rich water from the depths to the surface. This, along with oxygen and energy from the sun, promotes the

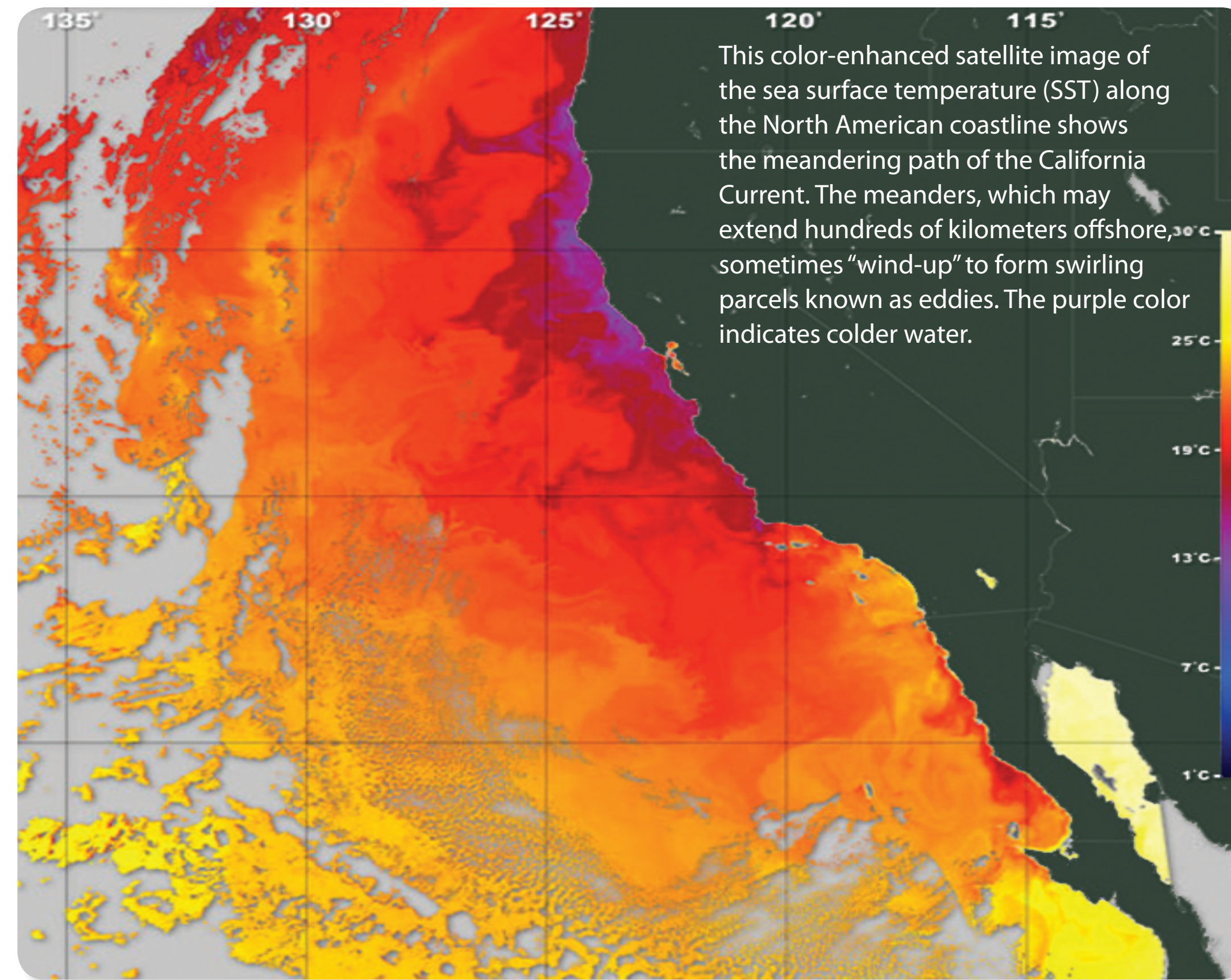
growth of phytoplankton which serve as the base of the marine food chain supporting an amazing diversity of marine life including invertebrates, fish, birds, and mammals.

WHAT IS THE CALIFORNIA CURRENT SYSTEM (CCS)?

The California Current System (CCS) contains a complex arrangement of moving water masses including the southern-flowing California Current (CC), which can extend up to 1000 km offshore, the subsurface California Undercurrent (CUC), the nearshore Davidson Current (DC), and the Southern California Countercurrent (SCC). All of these components must be considered for a complete description and understanding of the California Current System.

CALIFORNIA CURRENT FACTS

- The California Current is among the most biologically productive marine environments in the world!
- The California Current System is characterized as having numerous circular surface formations called "Eddies" which form by meandering sections that spin off in different directions.
- The California Current System includes currents, such as the CUC and DC, which flow in the opposite direction from the CC. These currents generally carry warmer, saltier water from the south, unlike the CC which transports cooler, fresher water from the north.
- The California Current keeps temperatures mild along the coast during the summer months.



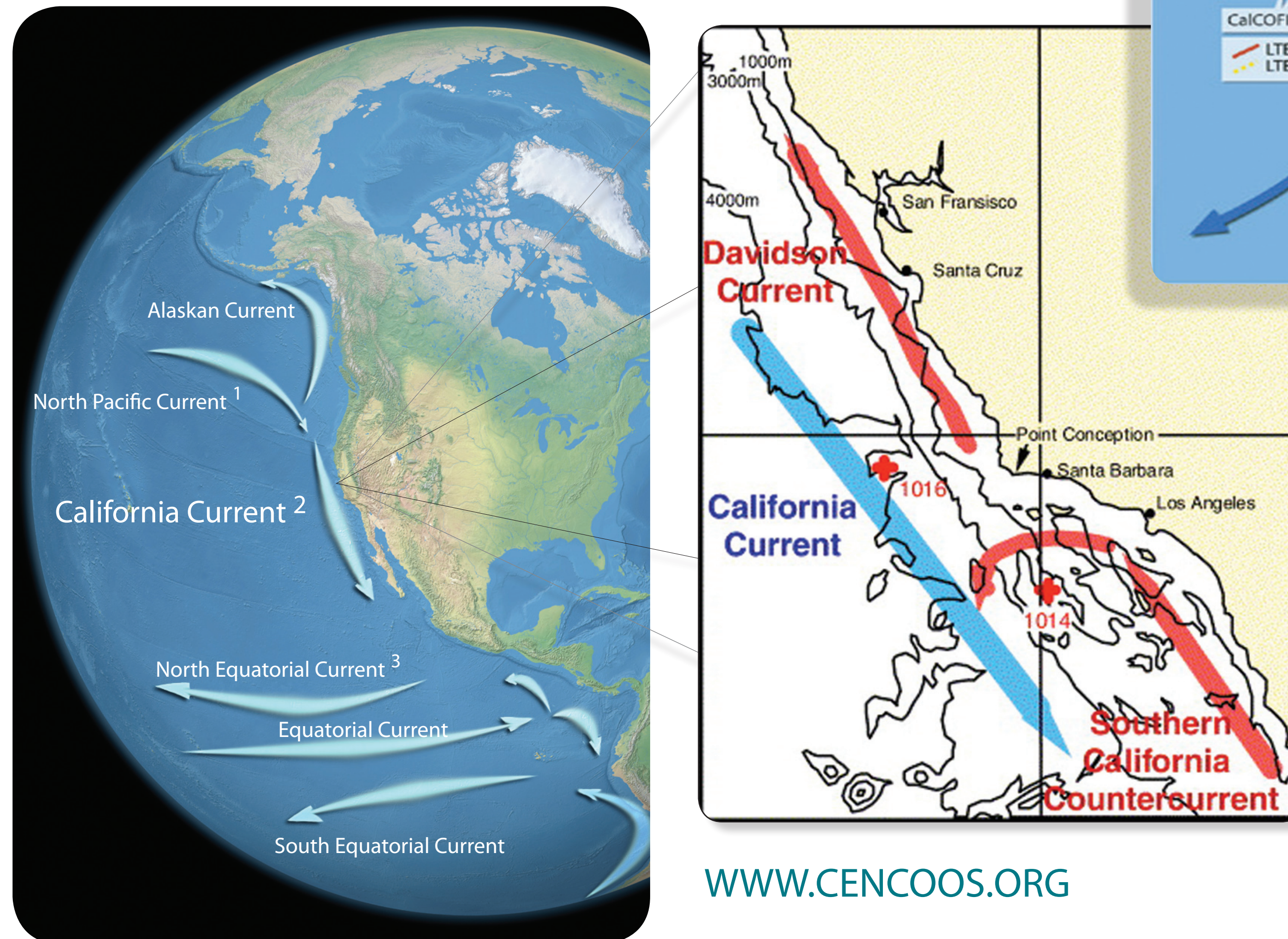
WHY DO WE STUDY CURRENTS?

Ocean currents are part of a global system of heat transport from the equator to the poles. This movement of heat influences global climate, local weather patterns, and living conditions for life on Earth. Monitoring sea surface current conditions, such as temperature and velocity from coastal and global ocean observing systems, has tremendous benefits including better response and mitigation of hazardous material spills, improved search and rescue operations, more effective protection and conservation of marine ecosystems, more accurate weather forecasting, and improved climate change predictions.

HOW DO SCIENTISTS STUDY CURRENTS?

Scientists collect information about a current's speed, temperature, and direction using the following tools:

- Drifting buoys that can be tracked with satellites over time
- Current meters that are mounted on moored buoys, fixed platforms, and ships
- Satellite altimeters that measure sea surface height (SSH) which can be used to infer the underlying ocean currents
- Shore-based high frequency (HF) radar that transmits electromagnetic waves across the ocean surface - The signal is backscattered to the station and is used to derive the current speed and direction.
- Numerical models that provide computer-generated predictions



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For more information on the integrated ocean observation system and other ocean science educational materials visit www.cencoos.org - Central and Northern California Ocean Observing System.

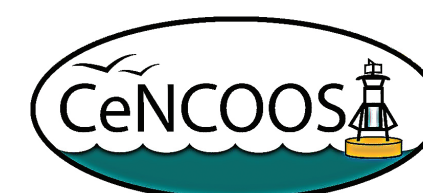
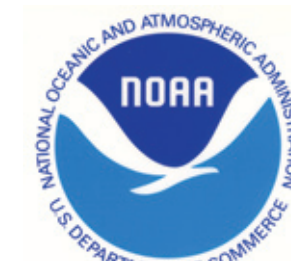
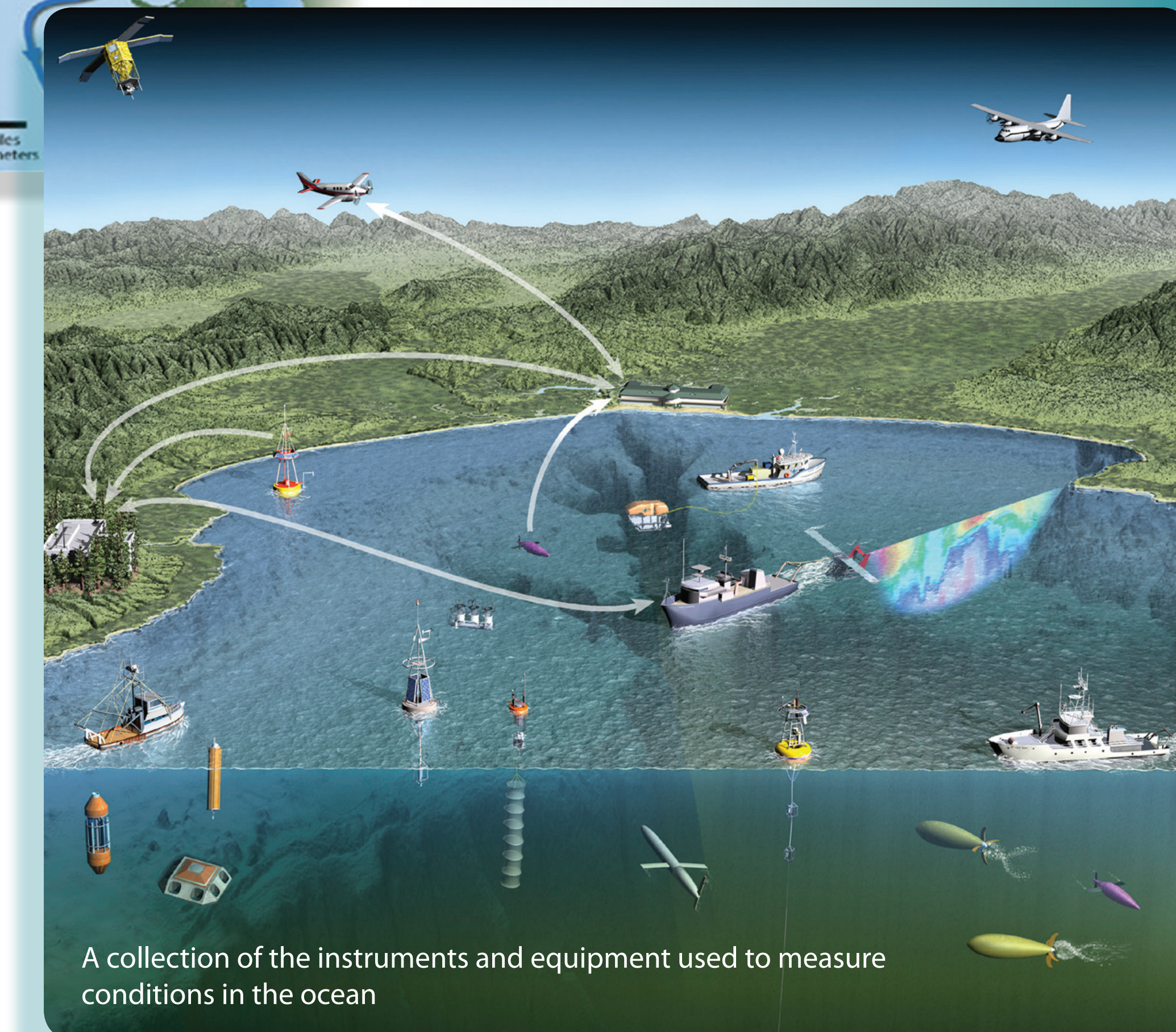


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