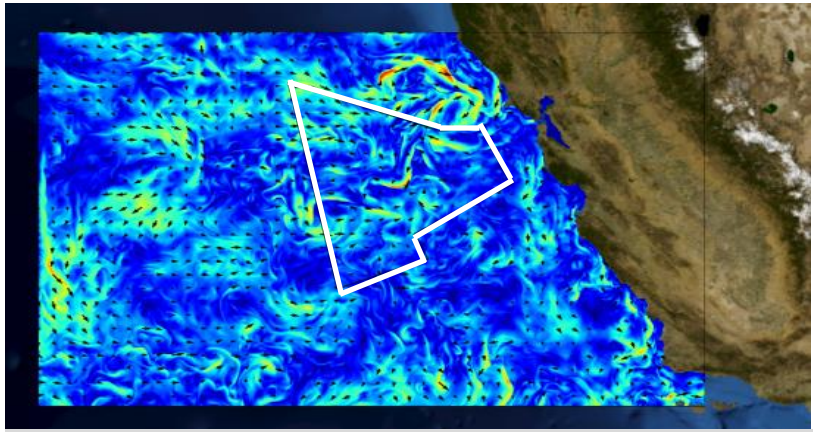
ARC manages field campaign Sub-Mesoscale Ocean Dynamics Experiment

Background: Small scale physical processes on the ocean's surface may play a significant role in climate change. Whirlpools and eddies influence the way the ocean absorbs and emits heat, greenhouse gases, and nutrients. In order to understand this relationship, NASA initiated S-MODE, the Sub-Mesoscale Ocean Dynamics Experiment. The project involves NASA centers, research institutions, and universities who operate instruments and analyze data from a range of aircraft, research ships, autonomous marine vehicles, and satellite observations. At the operation's helm, ARC's Earth Science Project Office (ESPO) provides project management for all mission phases.

Main Findings: Data collected from the three S-MODE campaigns offer researchers an unprecedented view of small-scale ocean physics, which will improve the accuracy of ocean modeling and, ultimately, to better forecast weather and climate. This monumental scientific effort was orchestrated successfully by ESPO. ESPO facilitated collaboration between governmental agencies and the academic community by developing and executing project plans, navigating bureaucratic hurdles and consensus building. ESPO facilitated each phase of the mission, from site preparation and ship mobilization support, to data management and public outreach.

Impact: Results from S-MODE fill a gap in climate modeling and drive future research on the ocean's role in Earth's complex climate system. The Earth Science Division at ARC was uniquely positioned to manage the S-MODE campaign because its research expertise is integrated in its airborne and shipborne field campaigns. ESPO will continue to manage projects that enable groundbreaking science with their upcoming project AEROMMA: Atmospheric Emissions and Reactions Observed from Megacities to Marine Areas.

ARC feature story on S-MODE



Surface currents from NCOM model data April 21, 2023 for S-MODE operations area (white trace) off California's coast.

The Today Show visited ARC for a news feature on S-MODE scientific results.