California seafloor mapping reveals hidden treasures

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This is a kelp greenling fish swimming above a seafloor of mixed gravel, cobble and rock outcrop with scattered shell. Fish is approx. 20 cm (8 inches) long. Image acquired 1 km (0.62 miles) offshore Half Moon Bay, California at a depth of 14 meters (46 ft). Also in the image are encrusting sponges, red algae (seaweed), and orange cup corals. Credit: U.S. Geological Survey

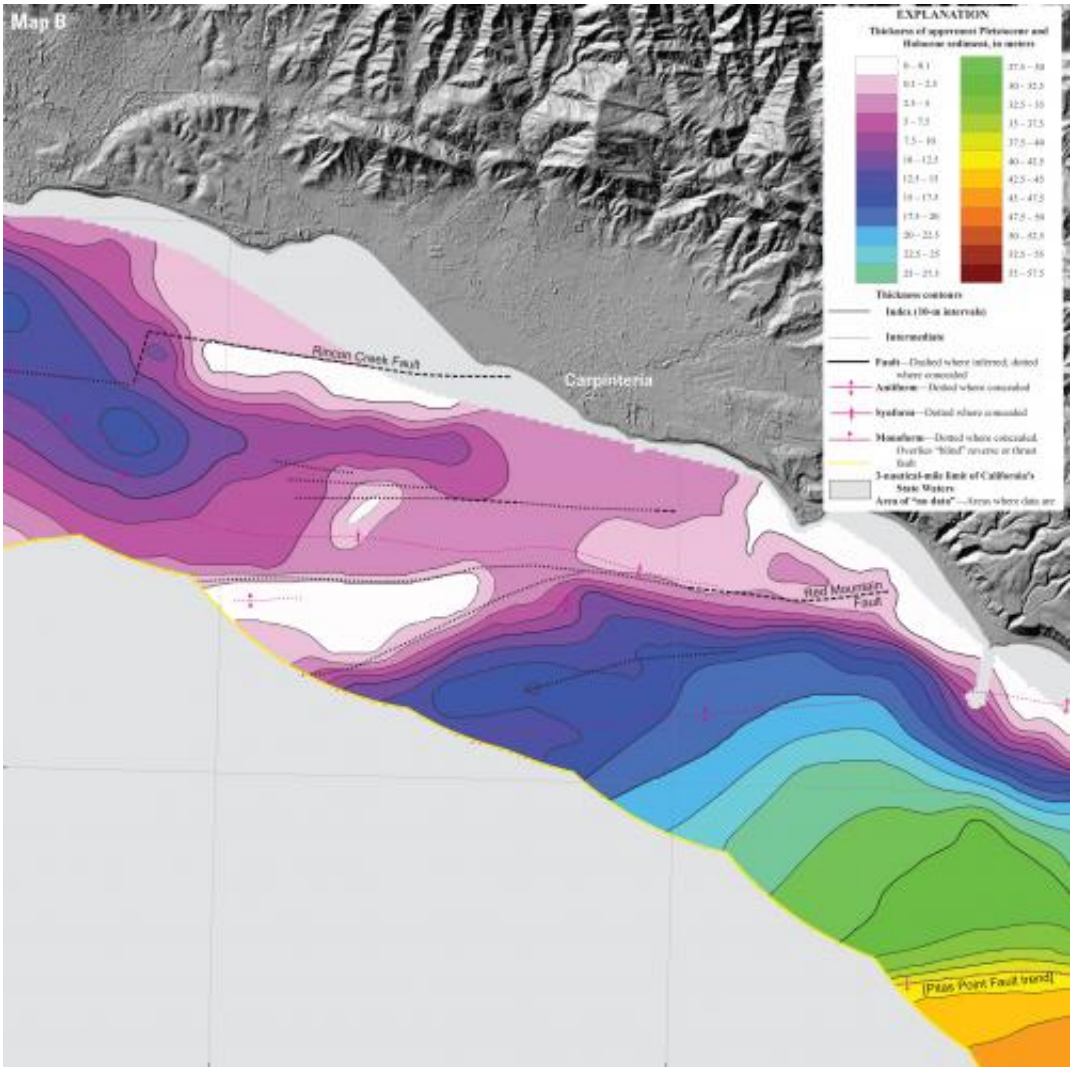
Science and technology have peeled back a veil of water just offshore of California, revealing the hidden seafloor in unprecedented detail. New imagery, specialized undersea maps, and a wealth of data from along the

California coast are now available. Three new products in an ongoing series were released today by the U.S. Geological Survey—a map set for the area offshore of Carpinteria, a catalog of data layers for geographic information systems, and a collection of videos and photos of the seafloor in state waters along the entire California coast.

"A program of this vast scope can't be accomplished by any one organization. By working with other government agencies, universities, and private industry the USGS could fully leverage all its resources," said USGS Pacific Region Director Mark Sogge. "Each organization brings to the table a unique and complementary set of resources, skills, and know-how."

The USGS is a key partner in the California Seafloor Mapping Program, a large, unique, and historically ambitious collaboration between state and federal agencies, academia, and the private sector to create a comprehensive base-map series for all of California's ocean waters. Scientists are collecting sonar data, video and photographic imagery, seismic surveys, and bottom-sediment data to create a series of maps of seafloor bathymetry, habitats, geology, and more, in order to inform coastal managers and planners, government entities, and researchers. With the new maps, decision makers and elected officials can better design and monitor marine reserves, evaluate ocean energy potential, understand ecosystem dynamics, recognize earthquake and tsunami hazards, regulate offshore development, and improve maritime safety.

"The Ocean Protection Council recognized early on that seafloor habitats and geology were a fundamental data gap in ocean management," said California's Secretary for Natural Resources and Ocean Protection Council Chair John Laird. "After an impressive effort by many partners to collect and interpret the data, the maps being produced now are providing pioneering science that's changing the way we manage our oceans."



This is a map showing thickness of bottom sediment in the Santa Barbara Channel offshore Carpinteria, Calif. Excerpt from USGS map SIM 3261, Sheet 9, inset Map B. California State Waters Map Series—Offshore of Carpinteria, California http://pubs.usgs.gov/sim/3261/. Credit: U.S. Geological Survey

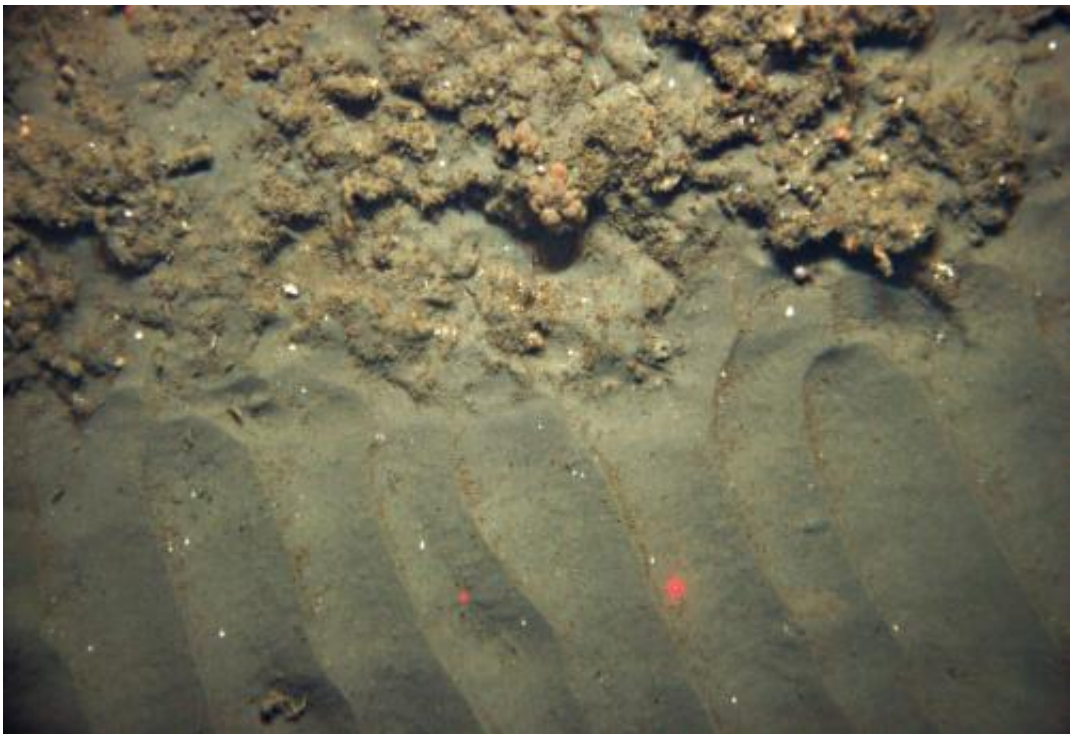
"Our collaboration with the state and more than 15 other partners is critical to the success of this program. We've come together to make the maps, and then to use them. We all like to say that you can't manage it, monitor it, or model it if you don't know what the 'it' is, and our seafloor

mapping gives that important 'it' to the entire coastal management and research community," said the USGS' lead researcher on this project, Sam Johnson.

USGS California Seafloor Mapping Program Map Series

The heart of the USGS California Seafloor Mapping Program effort is a series of map sets. To date, three sets have been published, including the most recent one released today covering the area "Offshore of Carpinteria," USGS Scientific Investigations Map 3261. Each of the map sets includes 10 or more sheets, illustrating different features of the seafloor, including geology, bathymetry, habitats, and geology within the three-nautical-mile limit of California's state waters. The maps are created through the collection, integration, interpretation, and visualization of swath sonar data, acoustic backscatter, seafloor video, seafloor photography, high-resolution seismic-reflection profiles, and bottom-sediment sampling data. Fourteen other map sets are being formatted for publication; the California State Waters Map Series is planned to comprise 83 such seafloor map sets spanning the entire coast of California.

USGS California Seafloor Mapping Program Data Catalog



This is an image of ripples in sand, next to a rocky surface on the seafloor 2.5 km (1.5 miles) offshore San Mateo County, California at a depth of 24.6 meters (81 feet). The two red dots in the image (from lasers mounted on the camera and used as reference points) are 15 cm (6 inches) apart. Credit: U.S. Geological Survey

Underlying the series of published seafloor map sets are large geospatial digital files, including bathymetry, acoustic backscatter, offshore geology and geomorphology, faults, folds, potential marine habitats, seafloor character, sediment thickness, visual observations of bottom habitat from video, and more. These data sets are now available through a new California State Waters Map Series Data Catalog for users to create their own maps or engage in further investigations of the seafloor. The catalog, USGS Data Series 781, provides all GIS data layers associated with the map sets published by the California Seafloor Mapping Program. Data will be continually added to the data series catalog as new seafloor map sets are published. All data files can be

viewed and downloaded at no charge. As the California Seafloor Mapping Program continues to produce new maps, they –and all the background data– will be made available online.

USGS California Seafloor Mapping Program Video & Photo Portal

The unique set of seafloor images (video and still photography) collected by the USGS from the U.S.-Mexico border to the Oregon state line is now available via a new California Seafloor Mapping Program Video and Photograph Portal. More than 500 hours of video and 87,000 photographs were collected and are now posted in the online portal for viewing. Scientists are using these data to ground-truth their interpretations of sonar data, to provide a framework for understanding seafloor ecosystems, and to create maps of seafloor materials and habitats. The video and photo portal is based on an interactive map, allowing users to zoom into a particular area, and see the imagery available. The video and still photographs of the same locations are displayed simultaneously, just as they were acquired along the track-line.

Provided by United States Geological Survey