Ultrahigh-resolution bathymetry of the axial channels within Monterey and Soquel submarine canyons

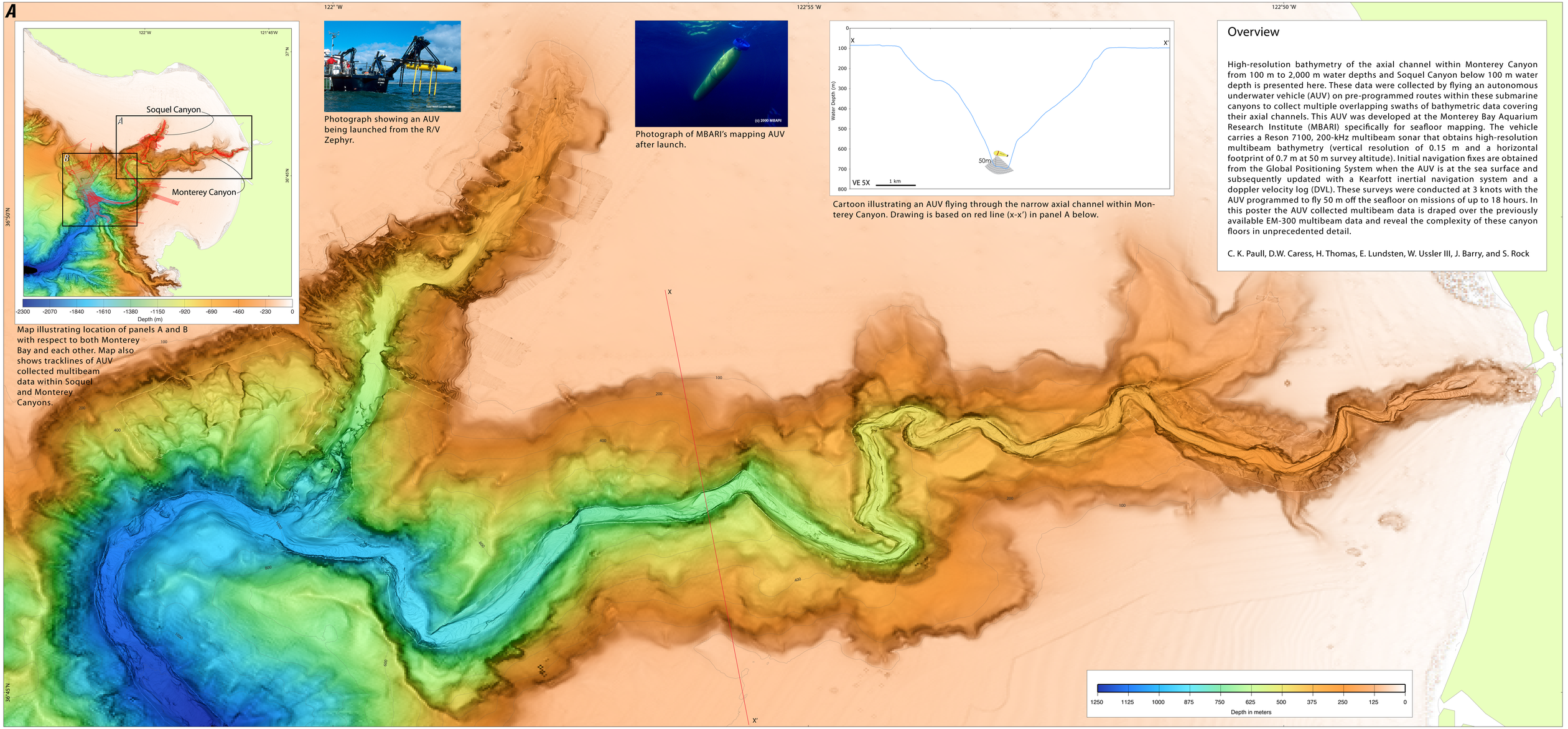
Map illustrating location of panels A and B with respect to both Monterey Bay and each other. Map also shows tracklines of AUV collected multibeam data within Soquel and Monterey Canyons.

Photograph showing an AUV being launched from the R/V Zephyr.

Photograph of MBARI's mapping AUV after launch.

Cartoon illustrating an AUV flying through the narrow axial channel within Monterey Canyon. Drawing is based on red line (x-x') in panel A below.

Overview

High-resolution bathymetry of the axial channel within Monterey Canyon from 100 m to 2,000 m water depths and Soquel Canyon below 100 m water depth is presented here. These data were collected by flying an autonomous underwater vehicle (AUV) on pre-programmed routes within these submarine canyons to collect multiple overlapping swaths of bathymetric data covering their axial channels. This AUV was developed at the Monterey Bay Aquarium Research Institute (MBARI) specifically for seafloor mapping. The vehicle carries a Reson 7100, 200-kHz multibeam sonar that obtains high-resolution multibeam bathymetry (vertical resolution of 0.15 m and a horizontal footprint of 0.7 m at 50 m survey altitude). Initial navigation fixes are obtained from the Global Positioning System when the AUV is at the sea surface and subsequently updated with a Kearfott inertial navigation system and a doppler velocity log (DVL). These surveys were conducted at 3 knots with the AUV programmed to fly 50 m off the seafloor on missions of up to 18 hours. In this poster the AUV collected multibeam data is draped over the previously available EM-300 multibeam data and reveal the complexity of these canyon floors in unprecedented detail.

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