

Direct Measurement of Field Turbidity Currents: Preliminary Results of the Monterey Coordinated Canyon Experiment

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Turbidity currents flowing through submarine canyons are among the most important sediment transport processes on Earth. When compared to other sediment transport processes such as rivers that have been monitored on regular bases for many years (e.g. USGS gauging network), there are very few direct measurements of turbidity currents in action. However, technological advances in recent years now have allowed us to directly measure the hydraulic and sedimentological properties of turbidity currents. The Coordinated Canyon Experiment (CCE) was designed to do just that - to capture field turbidity current events in Monterey Canyon, offshore California. A total of 6 moorings that hosted instrument packages including acoustic Doppler current profilers (ADCPs), temperature and salinity sensors, turbidity sensors, and sediment traps were distributed from 270 to 1,850m water depths along the axis of the canyon. In addition, an array of benthic event detectors (BEDs) that record the canyon floor movements were deployed in the shallow reaches of the canyon. During the first two deployments (2015/10 –2016/4; 2016/4 –2016/10), at least 2 turbidity currents were recorded to run out for more than 50km, passing through all 6 moorings with average velocities of 5.4 and 4.2m/sec respectively. Individual moorings and instruments were transported down-canyon up to 7.8 km in one event. This talk will present some highlights of the recorded turbidity currents and discuss the preliminary findings from this rare CCE dataset.

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