Filling the gap between turbidity current processes and products in British Columbia fjords

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Turbidity currents are one of the volumetrically most important processes to transfer sediments from land to sea. Fast-moving, powerful turbidity currents can damage seafloor infrastructure and carve submarine channels. These submarine channels feed deep sea fans, which are the largest sediment accumulations on Earth. Such huge sediment accumulations sequester organic carbon over geologic timescales and are thus thought to play a role in the global carbon cycle. Despite the global significance of turbidity currents, the link between flow processes (e.g. triggering mechanisms, seafloor erosion) and depositional products is still poorly constrained. This lack of knowledge is mainly due to the difficulty to monitor flows and to directly sample the associated deposits to these flows. Here we present direct observations of turbidity currents and their deposits in two Canadian fjords: Howe Sound and Bute Inlet in British Columbia. As these two fjords are connected at their head to glacier-fed rivers, they are excellent sites to study the transport and fate of particles from land to submarine sites. Using these new observations, this talk will cover three research themes: 1) How do dilute river plumes generate turbidity currents? 2) What is the depositional architecture/facies resulting from supercritical turbidity currents and crescentic bedforms? 3) How are organic carbon mixtures distributed in turbidites and what are the implications for the carbon cycle?

Keywords: turbidity current, turbidite, organic carbon, crescentic bedforms

