

Peer Review Plan

Date: 10/30/2013

Source Center: U.S. Geological Survey (USGS)
St. Petersburg Coastal and Marine Science Center
600 4th Street South
St. Petersburg, FL 33701

Preliminary Title: Use of USGS Wave Scenarios to Assess Potential Submerged Oil Mat (SOM) Formation along the Coast of Florida and Alabama.

Subject and Purpose: During the Deepwater Horizon oil spill, oil in the surf zone mixed with sediment to form heavier-than-water mats of various sizes, ranging from small (cm-scale) pieces to large mats (100-m scale). If the beach profile accreted at a particular site following the sinking of this material to the seafloor, sand/oil agglomerates may remain buried at that location. To assist in locating these potential sites of buried oil, previously developed USGS wave scenarios were used to identify at what depths surface oil had the potential to mix with resuspended sediment. For sediment to mix with floating oil and form an agglomerate of sufficient density to sink to the seafloor, either the water must be very shallow (e.g., swash zone) or sediment must be suspended to the water surface in sufficient concentrations to create a denser-than-sea water agglomerate. The focus of the current analysis is the latter possibility, suspended sediment mixing with surface oil in depths beyond the swash zone, in order to define the offshore limit of mat formation. A theoretical investigation of the amount of sand required to mix with oil and form a sinking mat revealed that non-breaking waves do not suspend enough sediment to the surface to form sinking sand/oil agglomerates. For this study, it was assumed that the cross-shore distribution of potential agglomerate formation could be captured by the primary breaker line, and the presence of plunging breakers, over the time frame of oiling. The potential locations of submerged oil mats (SOMs) are sites where (1) possible agglomerate formation occurred, (2) sediment accreted post-oiling and buried the SOM, and (3) the bathymetry has not subsequently eroded to re-expose any mat that may have formed. To facilitate the identification of these locations, the range of water level variation over the timeframe of oiling was also characterized, which when combined with the wave-breaking depth analysis and pre-oiling bathymetry would identify the potential geographic locations of SOMs. The manuscript for the subject information product will be submitted as an appendix to the Operational Science Advisory Team's (OSAT3) report to the U.S. Coast Guard Federal On-Scene Coordinator.

Impact of Dissemination: This information product is considered by the USGS to be Influential Scientific Information.

Timing of Review (Including Deferrals): September-October 2013. Deferrals are not anticipated at this time.

Manner of Review, Selection of Reviewers, and Nomination Process: Review will be by individual letters/memoranda/documents. USGS will select peer reviewers pursuant to requirements in Survey Manual chapter 502.3—Fundamental Science Practices: Peer Review (<http://www.usgs.gov/usgs-manual/500/502-3.html>).

Expected Number of Reviewers: Anticipate a minimum of two peer reviewers.

Requisite Expertise: Oceanography; hydrodynamic modeling; sediment/contaminant transport; oil spill response; mitigation of oil mats in the surf zone.

Opportunity for Public Comment: No opportunity for public comment is formally incorporated for this product.

Agency Contact: peer_review_agenda@usgs.gov.