The Reach Sensitivity Index: A Planning and Response Tool for Rivers, with Examples from Puerto Rico

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ABSTRACT

The Reach Sensitivity Index (RSI) is an oil spill planning and response tool which uses a watershed approach emphasizing stream reaches to map the sensitivity of smaller rivers and streams. RIS maps have been developed for sixteen of the rivers and streams on the main island of Puerto Rico. The maps encompass all of the major rivers on the island, from headwaters to river mouth. The RSI maps are merged with the shoreline Environmental Sensitivity Index (ESI) maps at the approximate upstream limit of salt water incursion into the stream. Both ESI and RSI maps and databases include biological and human-use resources.

The sensitivity of the reaches of the rivers and streams of Puerto Rico is based on the:

1) Degree of difficulty anticipated for the containment and recovery of the spilled oil from the water surface
2) Degree of mixing of oil into the water column
3) Potential for retention of the oil (e.g., by penetration of the oil into coarse-grained sediments on bars in the stream, or between large boulders; trapping of oil by vegetation on bars and banks)
4) Ease of cleanup
5) Sensitivity and vulnerability of associated wetlands
6) Human use
7) Sensitivity and importance of stream biota

The RSI delineated for Puerto Rico, presented in order of increasing sensitivity to spilled oil, is listed below:

1) Quiet pool; low-sensitive banks
2) Straight channel with currents; low-sensitive banks (mud dominant)
3) Meandering channel; sand point bars
4) Meandering channel; vegetated point bars
5) Rapids over bedrock
6) Meandering channel; sand and gravel point bars
7) Split channels with coarse gravel; some rapids
8) Small falls; boulders in channel
9) Large falls; boulders in channel
10) Channels with associated vulnerable wetlands

The presentation will present the methods used in determining the RSI and how the RSI should be used