

# Customizable Oil Spill Modeling Particles

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TRL 3



TEM image of a Tunable Fluorescent Oil Spill Modeling Particle

### Context

Recent events have emphasized the need to have effective chemical and oil spill modelers to understand contaminant behavior before a real-world release event. Responses to the *Deepwater Horizon* oil spill demonstrated a need to better understand behavior, transport dynamics and fate of dispersed chemical and oil contaminants in aquatic systems.<sup>1</sup> This problem is further exacerbated by field test limitations: intentionally releasing crude oil products in the field is problematic, at best.

#### Summary

EPA researcher Zimmer created a method of customizing particles for modeling oil spill and other chemical dispersal events. Both the size and makeup of the core can be tuned to create nano to micro- to macrosized particles that may, for example, fluoresce or be visible to the unaided eye. Additionally, the shell of the particle can be tuned to create particles that can sink, float, or have neutral buoyancy in water, and that either repel or attract each other. Through these tailoring methods, the appropriate particle to simulate different spill conditions can be created and used in modeling in waterway systems. The particles could readily be used to model oil plume and oil slick conditions in laboratory or field settings.

## **Potential Applications**

- Emergency Management Preparation
- Disaster Response Monitoring
- Search and Rescue Simulation

#### Contact

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<sup>1</sup> The Future of Dispersent Use in Oil Spill Response Initiative, Coastal Response Research Center, Research Planning Incorporated, National Oceanic and Atmospheric Administration, 2012, <u>https://crrc.unh.edu/sites/crrc.unh.edu/files/media/docs/Workshops/dispersant\_future\_11/Dispersant\_Initiative\_FINALREP\_ORT.pdf</u>.