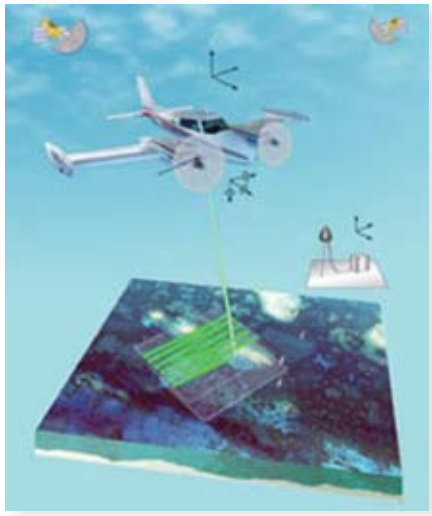
Does "measure," "model," and "map" apply to oil spills?

—by Jeff Thurston



Geographic information systems can provide valuable data and information for effective decision-making in a multitude of real-life situations. Attempting to respond to an oil spill for example, without making good use of GIS tools is not just unwise; it can prolong the response to the disaster and result in poor information flows between decision-makers and responders, among responders, and between responders and the public.

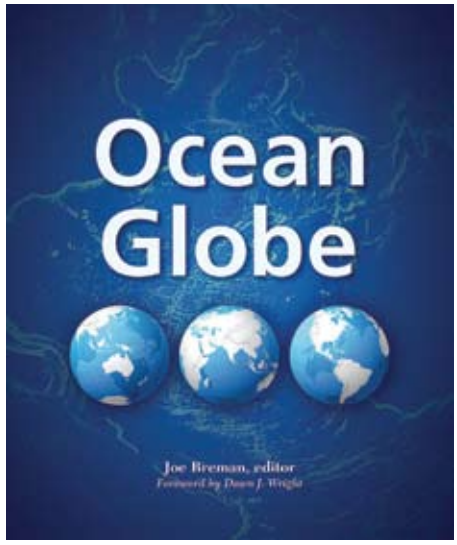
From the moment crude oil spills out, it becomes a spatial problem which immediately calls for understanding its dimension, communicating its size and impact, and coordinating the response to those impacts. Maps are like language; through their graphics, symbology, and text, stories are created and shared. Visually powerful maps cut to the chase and provide understanding immediately.

Oil spills are 2D, 3D, and 4D problems. Consider the oil spill in the Gulf of Mexico. Originally most communication focused on location—people wanted to know where the spill was happening. A latitude and a longitude provided the (x, y) of the location in 2D. But as the oil spill continued, its duration became the over-riding issue. Still later, people's attention turned from the spill's location and temporal dimension to the horror of its greasy presence on the surface and in dark columns beneath the surface—the third dimension of the problem.

A number of technologies exist for measuring the location of 2D and 3D objects. However, if we want to know what the effects of the oil spill might be on the Gulf's beaches, for instance, then one needs to look at the problem in a more comprehensive manner. Sophisticated tools have been developed by GIScience to analyse measurement data contributed by crowd-sourcing, build models of the disaster, its effects, and the likely path to mitigating them, and then share this information via a digital map.

I find it odd that these tools are yet to be fully implemented in the Gulf. We need accurate baselines from which reparations can begin now. We need accurate analysis and visualization of the problem we are confronting to respond to it effectively and, above all, we need to communicate more—about the oil spill's impact on people's livelihoods, their health, and the health of the ecosystem that supports life in the Gulf.

One of the technologies which is already used to capture the "third dimension' of natural and man-made crisis events is LiDAR (light detection and ranging) mapping. The State of Louisiana is pursuing a statewide LiDAR mapping program (http://atlas.lsu.edu/central/la_lidar_project.pdf). Doubtless, the geospatial data this program has been collecting will prove immensely valuable in confronting the work in the Gulf over many years to come.



Literature abounds in research into GIS and other geospatial technologies which increase our understanding of the world around us and our dealings with it. One of the latest among many excellent contributions is *Ocean Globe*, a book published by Esri, which examines the use of bathymetry, GIS, and other technologies to map the ocean floor.

"Our perception of the ocean floor has expanded through the use of GIS tools and geospatial applications," writes Joe Breman, editor of the anthology. "The more we know about the underwater environment, so seldom visited by most people, the more our lives will benefit above ground."

—How very true in the context of the current crisis.