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Complete data lifecycles and citizen science integration via The Public Laboratory

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The collection, communication, and sharing of data relating to the 2010 Deepwater Horizon oil spill proved to be a case study in the lack of data transparency and poor collaboration on a variety of levels. British Petroleum and the government worked together to keep the public out of the spill area while collecting over 31,000 water and sediment samples from the Gulf of Mexico after the initial explosion in April, 2010. Although thousands of images were immediately collected by the National Oceanic and Atmospheric Administration and the US Geological Survey, some of those raw data sets still remain inaccessible, are in difficult to use formats, or have been modified for public release. The lack of sharing of information by federal agencies and BP was particularly frustrating given the use of publicly funded resources. Discrepancies between information posted on federal and state websites and conditions in the field were apparent and a key factor in the poor relations between authorities and local residents. The conditions under which data is collected, the affiliation of the authors, and the intended use, vastly impacts how well we trust those data.

The solution, we believe, is for local communities to produce their own high-quality data through collaboration with organizations such as The Public Laboratory for Open Technology and Science. The Public Laboratory community worked with Gulf Coast residents in the field to document the effects of oil on shorelines with do-it-yourself aerial photography. For less than $100 in parts, we used helium balloons and kites to send cameras to over a thousand feet, and stitched the resulting images into high-resolution maps using our free, open-source software. Over a hundred volunteers hit the beaches to take tens of thousands of photos, depicting slicks, oiled wetlands, and the birds, fish, and plants threatened by the disaster. Our efforts resulted in the largest repository of publicly archived oil spill data to date and it is for use without restriction. Public Laboratory techniques are cheaper, more temporally relevant, more portable, and more accurate than other methods of remote sensing. In some cases, our spatial resolutions were 20 times better than those of Google Earth. Our integration of community members represents a bottom up approach in data collection, management, and literacy. The Public Laboratory data archives are maintained on-line with public access and all our software is open source with the source code publicly available. We believe this approach to be the new paradigm in data transparency, whether privately or publicly funded.

The Public Laboratory has even initiated discussions with lawyers familiar with environmental laws to increase possible uses in litigation. But the data are collected for the public, by the public. By involving the public and any interested parties in the collection of data and tracking that data horizontally from collection to publication, we engage a larger number of people making transparency inherent in the process. We have found greater levels of interest and comprehension by citizens when they are involved in the inclusive process.