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Size of Oil Spill Underestimated, Scientists Say

By JUSTIN GILLIS
Published: May 13, 2010

Two weeks ago, the government put out a round estimate of the size of the [oil](#) leak in the Gulf of Mexico: 5,000 barrels a day. Repeated endlessly in news reports, it has become conventional wisdom.



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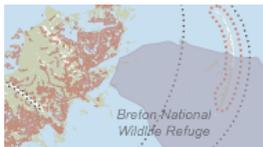
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Corey Levy, a shrimp boat crew member, lay Thursday among booms used to collect oil. The crew was waiting for the waters to calm before putting out the booms.

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But scientists and environmental groups are raising sharp questions about that estimate, declaring that the leak must be far larger. They also criticize [BP](#) for refusing to use well-known scientific techniques that would give a more precise figure.

The criticism escalated on Thursday, a day after the release of a video that showed a huge black plume of oil gushing from the broken well at a seemingly high rate. BP has repeatedly claimed that measuring the plume would be impossible.

The figure of 5,000 barrels a day was hastily produced by government scientists in Seattle. It appears to have been calculated using a method that is specifically not recommended for major [oil spills](#).

Ian R. MacDonald, an oceanographer at [Florida State University](#) who is an expert in the analysis of oil slicks, said he had made his own rough calculations using satellite imagery. They suggested that the leak could "easily be four or five times" the government estimate, he said.

"The government has a responsibility to get good numbers," Dr. MacDonald said. "If it's beyond their technical capability, the whole world is ready to help them."

Scientists said that the size of the spill was directly related to the amount of damage it would do in the ocean and onshore, and that calculating it accurately was important for that reason.

BP has repeatedly said that its highest priority is stopping the leak, not measuring it. "There's just no way to measure it," Kent Wells, a BP senior vice president, said in a recent briefing.

Yet for decades, specialists have used a technique that is almost tailor-made for the problem. With undersea gear

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that resembles the ultrasound machines in medical offices, they measure the flow rate from hot-water vents on the ocean floor. Scientists said that such equipment could be tuned to allow for accurate measurement of oil and gas flowing from the well.

Richard Camilli and Andy Bowen, of the Woods Hole Oceanographic Institution in Massachusetts, who have routinely made such measurements, spoke extensively to BP last week, Mr. Bowen said. They were poised to fly to the gulf to conduct volume measurements.

But they were contacted late in the week and told not to come, at around the time BP decided to lower a large metal container to try to capture the leak. That maneuver failed. They have not been invited again.

"The government and BP are calling the shots, so I will have to respect their judgment," Dr. Camilli said.

BP did not respond Thursday to a question about why Dr. Camilli and Mr. Bowen were told to stand down. Speaking more broadly about the company's policy on measuring the leak, a spokesman, David H. Nicholas, said in an e-mail message that "the estimated rate of flow would not affect either the direction or scale of our response, which is the largest in history."

Dr. MacDonald and other scientists said the government agency that monitors the oceans, the National Oceanic and Atmospheric Administration, had been slow to mount the research effort needed to analyze the leak and assess its effects. Sylvia Earle, a former chief scientist at NOAA and perhaps the country's best-known oceanographer, said that she, too, was concerned by the pace of the scientific response.

But Jane Lubchenco, the NOAA administrator, said in an interview on Thursday: "Our response has been instantaneous and sustained. We would like to have more assets. We would like to be doing more. We are throwing everything at it that we physically can."

The issue of how fast the well is leaking has been murky from the beginning. For several days after the April 20 explosion of the Deepwater Horizon rig, the government and BP claimed that the well on the ocean floor was leaking about 1,000 barrels a day.

A small organization called [SkyTruth](#), which uses satellite images to monitor environmental problems, published an estimate on April 27 suggesting that the flow rate had to be at least 5,000 barrels a day, and probably several times that.

The following day, the government — over public objections from BP — raised its estimate to 5,000 barrels a day. A barrel is 42 gallons, so the estimate works out to 210,000 gallons per day.

BP later acknowledged to Congress that the worst case, if the leak accelerated, would be 60,000 barrels a day, a flow rate that would dump a plume the size of the [Exxon Valdez](#) spill into the gulf every four days. BP's chief executive, Tony Hayward, has estimated that the reservoir tapped by the out-of-control well holds at least 50 million barrels of oil.

The 5,000-barrel-a-day estimate was produced in Seattle by a NOAA unit that responds to oil spills. It was calculated with a protocol known as the [Bonn convention](#) that calls for measuring the extent of an oil spill, using its color to judge the thickness of oil atop the water, and then multiplying.

However, Alun Lewis, a British oil-spill consultant who is an authority on the Bonn convention, said the method was specifically not recommended for analyzing large spills like the one in the Gulf of Mexico, since the thickness was too difficult to judge in such a case.

Even when used for smaller spills, he said, correct application of the technique would never produce a single point estimate, like the government's figure of 5,000 barrels a day, but rather a range that would likely be quite wide.

NOAA declined to supply detailed information on the mathematics behind the estimate, nor would it address the points raised by Mr. Lewis.



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Mr. Lewis cited a video of the gushing oil pipe that was released on Wednesday. He noted that the government's estimate would equate to a flow rate of about 146 gallons a minute. (A garden hose flows at about 10 gallons per minute.)

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"Just anybody looking at that video would probably come to the conclusion that there's more," Mr. Lewis said.

The government has made no attempt to update its estimate since releasing it on April 28.

"I think the estimate at the time was, and remains, a reasonable estimate," said Dr. Lubchenco, the NOAA administrator. "Having greater precision about the flow rate would not really help in any way. We would be doing the same things."

Environmental groups contend, however, that the flow rate is a vital question. Since this accident has shattered the illusion that deep-sea oil drilling is immune to spills, they said, this one is likely to become the touchstone in planning a future response.

"If we are systematically underestimating the rate that's being spilled, and we design a response capability based on that underestimate, then the next time we have an event of this magnitude, we are doomed to fail again," said John Amos, the president of SkyTruth. "So it's really important to get this number right."

This article has been revised to reflect the following correction:

Correction: May 19, 2010

Because of an editing error, an article on Friday about the volume of oil leaking into the Gulf of Mexico misstated, in some editions, the date for the explosion aboard the Deepwater Horizon oil rig. It occurred late on the evening of April 20, not on April 21.

A version of this article appeared in print on May 14, 2010, on page A1 of the New York edition.

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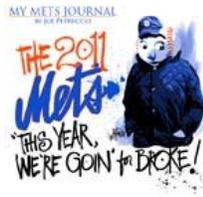
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