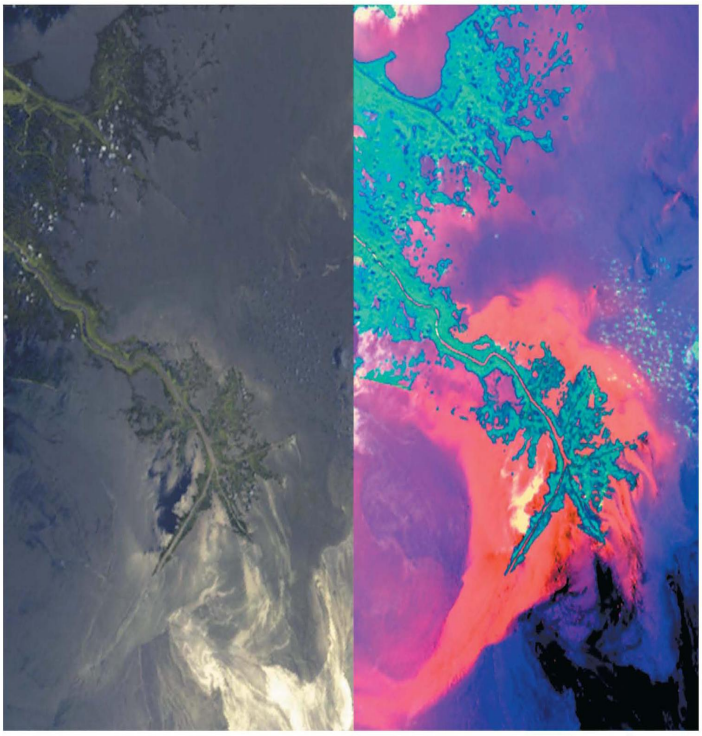
Unknown Quantities

PETER GALISON AND CAROLINE A. JONES ON OIL SPILL IMAGING



Oil moving into Louisiana's coastal wetlands, May 24, 2010. Photo: NASA/GSFC/LaRC/JPL, MISR Team.

HAVE WE ALREADY FORGOTTEN? On April 20, 2010, a high-pressure methane bubble shot up through the drilling pipe of *Deepwater Horizon*, an offshore oil rig operated on behalf of British Petroleum in the Gulf of Mexico. The gas exploded and killed eleven workers; the giant rig was still burning two days later when it sank, and over the course of the next eighty-four days the ruptured mile-down well released approximately 206 million gallons of oil, constituting the largest petrochemical "spill" in history. Images played a unique role in the crisis, accompanying it at every turn but also failing, by definition, to capture that which could not be made visible. What we *could* see were tragic images of oil-coated shorebirds, sublime satellite photographs of iridescent oil slicks on the ocean surface, and stream-of-catastrophe footage that brought the wellhead gusher onto computer screens around the world. Such sights galvanized response, but as those surface images (seafloor surface, ocean surface, and shorefront) faded, both the public and the politicians were primed to declare the spill over. That we have yet to develop or popularize certain kinds of technologies of vision (for deep ocean vertical plumes, for durational models of wetland change, or for the microscopic uptake of petro dispersants inside organisms) produces specific invisibilities that fit well with corporate policy. No picture, no action.

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The three types of images outlined above seem to apply to all oil spills, even those half a world away in rural China. These types reveal patterns in the visible that structure the occlusions of the invisible as well. Most familiar were those midsize close-ups of pathetic oil-drenched creatures (seagulls, pelicans, turtles, dolphins), safe in human hands.[1] Clustered under rubrics such as "Cleaning Dalian Harbor" (the *Boston Globe*, in reference to the PetroChina spill that hit the North China port in July) or "Making It Right" (on BP's website),[2] these all-too-familiar spill icons combine the sad fate of individual creatures with a media-ready rescue in a perfect combination: a technological failure, a compassionate human-scale response, a documented cleanup. Never mind that only a fraction of the oil-doused birds make it to the cleanup station, or that biologists assert that only a small percentage actually survive in the medium term.[3] And forget the countervailing images that, in a ghastly parallel to the BP riggers' deaths, show us the drowning of a cleanup worker in the PetroChina spill flooding Dalian harbor. Deaths are not intended to be in the messages that accompany these images, nor are they what either BP or the environmental volunteers want to hear. If the streaming spill images have a Hollywood ending, the bird-in-cleaning is their movie poster.

Substituting sublimity for tragedy, the second type of image emerged primarily from NASA (and the less well-funded NOAA [National Oceanic and Atmospheric Administration]): pictures taken from space of colorful slicks and billowing subsurface phenomena, and spectrally enhanced views of oily incursions on the ocean surface (accompanied by excited captions such as "NASA's MISR provides unique views of Gulf oil slick"). Mostly they provided everyday Web surfers with support for the definitive scientific judgment: Yep, it's oil. But these were also the most hauntingly beautiful of the spill images, reminding us that such distanced tragedy is the very stuff of the sublime (from Longinus to Burke to Lyotard), its technovariants a stock-in-trade of our cyberfictions and disaster films. The sublime often works to blunt political response even as it stimulates aesthetic

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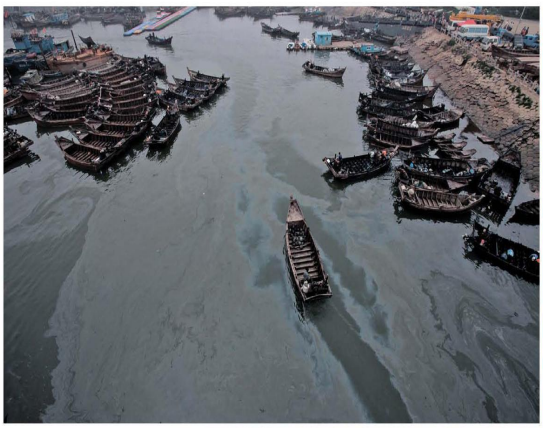

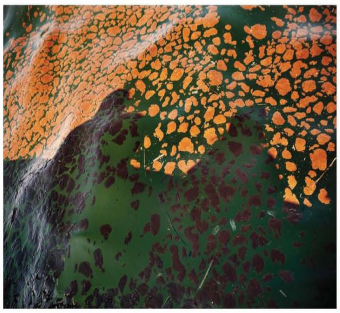

Clockwise from top left: **Fishing boats, Dalian, China, July 24, 2010.** Photo: Arthur Jones Dionio/Greenpeace. **Oil (silver) at the mouth of the Mississippi Delta, May 24, 2010.** Photo: Jesse Allen/NASA/GSFC/METI/ERSDAC/JAROS and US/Japan ASTER Science Team. **Dispersant-treated oil off the Chandeleur Islands, Louisiana, May 7, 2010.** Photo: Jason Andrew/Getty Images.

contemplation of a distant doom. When such images fuel understandable but draconian decisions to curb all offshore drilling, those politics can be just as distant from the catastrophe's more intimate or systemic scales. The burning question of where local inhabitants are to find work when tourism, fishing, and the oil industry all collapse at once is brought to a head by the moratorium in a way that belies BP's "Making It Right—Beaches" and shadows even the Obama family's cheerful August swim off the Florida coast. It was only by setting aside the images' sublimity that data miners in the scientific and activist communities were able to take up the views from space for pragmatic modeling of the ongoing situation—will the next tropical storm dump oil balls, or spray droplets of petroleum? Will waves disperse, or deposit, the sludge? The Loop Current may have had a name before the BP disaster, but with the spill we could see what it looked like: The nine cameras on top of the NASA Terra satellite aimed at the slick from various vantage points in order to cull differentials in refracted and reflected light; they measured the parallax from their differently angled lenses and beamed the collected data to the Jet Propulsion Laboratory in Pasadena, California. There, it was parsed and recombined to create a psychedelic portrait of our oil addiction, blossoming in the lazy current coming up from the Yucatán before picking up its petrochemical load for dropping into the Gulf Stream—and into our Internet imaging algorithms.

Between the intimate scale of individual death and the sublimity of the satellite view was the webcam a mile down on the ocean floor. Of all the spill images, those provided by this camera were the only ones to be unprecedented, installing in our techno-imaginary the live feed of oil billowing from BP's broken wellhead to form its own imagistic "gusher," defeating all the technical verbiage ("static kill," "top kill," "side kill," "blowout protector") and proving so incendiary that it took considerable effort by Representative Ed Markey (D-MA) to pry it from BP's proprietary control. Grudgingly made public by BP on May 19, and later accessible from a link on the Congressional energy site, the "spillcam" darkened once the well's flow was capped on July 15, its once urgent activity now cached in YouTube archives that show pixilated documentation of the burbling ejecta. Meant to galvanize response and doubtless determinative in extending the administration's moratorium,[4] the feed's online posting was a victory for the public sphere, fueling ongoing efforts to hold BP and its numerous subcontractors financially and politically accountable. Presumably the government's sumptuous NASA slide show intended the same. And all these images and their public sources *did* have impact. As soon as BP released initial video of the wellhead to selected agencies on May 13 (even before it was posted online), scientists were able to revisit estimates made from satellite photos and to recalculate the flow to ninety-five thousand barrels a day (a barrel containing forty-two gallons), directly confronting the corporation's preposterous initial estimates of one thousand to five thousand daily barrels.[5] The spillcam's unprecedented imagery—so much finer in detail and information, seemingly, than any of our technologies for controlling the leak itself—was clearly the most effective in galvanizing action.

What philosophies can we generate in this millennium to build on the once-unstoppable imagery of the webcam? If the similarly pixilated "Patriot" shots from the first Gulf War were as punchy as video games, the BP webcam shots were unbearably durational, live, endless, ceaseless, hour after hour, day after day, month after month. The brief happenstance of a "spill" (a sudden event, captured in the speed of "Doc" Edgerton's strobe) was a term that couldn't possibly encompass the hemorrhaging, billowing brown crude that *kept on gushing* from the unknowable depths, beyond the visibility of our surfaces (ocean, shore, floor), into untold futures and dissolving durational extensions. Quite unlike the fast-paced news cycle

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Clockwise from bottom left: **Oil-coated shellfish in Dalian, China, July 26, 2010.** Photo: Arthur Jones Dionio/Greenpeace. **Still from BP's feed documenting the oil gushing into the Gulf of Mexico, 2010. Volunteer holding a cormorant covered in oil from the tanker Prestige, Galicia, Spain, December 5, 2002.** Photo: Pedro Armestre/Greenpeace. **Veterinarians bathing a pelican, Fort Jackson Wildlife Rehabilitation Center, Buras, LA, May 15, 2010.** Photo: Hans Deryk/Reuters. **Chinese emergency services conducting an oil-spill simulation exercise in the Bohai Sea off the coast of Qinhuangdao, China, June 6, 2007.** Photo: China Daily/Reuters.

with its banners and "swooshes," the spillcam offered a continuing and repetitive announcement of our ability to picture but not to stop the flow, to make images but not achieve a satisfying response (from BP, or, for that matter, from our government's mining management agency, locked as it is in the cozy embrace of the oil industry). Watching these webcam images became a form of environmental torture that we have not yet theorized or adequately examined.

These images—the pathos of bird cleaning, the sublimity of space views, the durational spewing of the Web gusher—will stand for the catastrophic failure of ever deeper wells, and of *Deepwater Horizon*. But that prophetic name demands that we keep scanning the darkening horizon of deep water, and calling for the nonimages that are *implied by the visibility* only because their *invisibility* is part of a system in which the seen is supported and enabled by the unseen. Just as Foucault would have parsed "Don't ask, don't tell" as a classic instantiation of how what can be said is intimately related to what cannot be said (both controlled by dispersed and internalized modes of power), so the systems of what can be made visible are intimately tied to what cannot. In this case, statistics reveal the ratio of the seen to the unseen: Based on pressure readings from the intermediate containment cap and on detailed analysis of the diminishment in flow over time, government scientists now calculate that only 20 percent of the oil that emerged from the broken wellhead was contained, leaving an astonishing 172.2 million gallons uncontained—counted, but still unaccounted for. Manifestly, this overage has been placed into the unseen registers of the "spill." While the gusher has stopped, that should only fuel our pondering of those aspects of catastrophe that have not been made visible, those sites where our awesome technologies of the image have yet to be applied.

Over the course of the past decade, it has become increasingly evident that oil released at great depth does not all come to the surface (particularly if it is dense crude). One controlled study of an oil release conducted off the Norwegian coast indicated that only a relatively small amount—between 2 and 28 percent—ever made it to the surface. The real damage is deeper, out of the camera's eye. And in the Gulf spill, to the annoyance of BP, NOAA, and the Coast Guard, chemical oceanographers have taken deepwater samples, mapped their distribution, analyzed their contents, and presented compelling evidence that vast undersea plumes of oil have formed and are drifting far from their site of origin.[6] Most scientists believe that these submerged columns were produced by quantities of dispersant (Nalco's "Corexit") injected at the wellhead. (BP reported applying one million gallons on the surface and another 721,000 gallons in subsea locations, but independent analysis of Corexit depletion estimates that yet another 965,000 gallons were deployed in unreported applications).[7] The toxic emulsifier is designed to break up the crude into tiny bits, which then take on a density close to that of water itself and either sink (from the surface slicks) or fail to rise (from the subsea emissions). No longer visible, the treated oil floats in those submerged transparent plumes, unimaged and hence largely unimagined. It may be that in the final analysis, the real role of the dispersant was to remove the spill from the camera—and with it, BP from the glare of popular and political scrutiny. The circuit—of drill, spill, "clean up," and drill again—relies on such systems of images and occlusions, in which the production of invisibility forms an aesthetic chiaroscuro to all the tragic, sublime, and subaquatic flows. Our response must be to take what's out of sight, and keep it well in mind. □

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NOTES

1. The incredible sequence "Photographer Captures Firefighter Losing His Life Cleaning Up Dalian Oil Spills," *China Hush*, August 3, 2010, can be seen at http://www.chinahush.com/2010/08/03/photographer-captures-firefighter-losing-his-life-cleaning-up-dalian-oil-spills.

2. For Dalian, see "Cleaning Dalian Harbor," *Boston Globe*, July 28, 2010, http://www.boston.com/bigpicture/2010/07/cleaning_dalian_harbor.html. For BP, see company website. http://www.bp.com/extendedsectiongenericarticle.do?categoryId=9034427&contentId=7063885.

3. See German biologist Silvia Gaus, as reported in Christine Dell'Amore, "Oil-Coated Gulf Birds Better Off Dead?," *National Geographic News*, June 9, 2010, http://news.nationalgeographic.com/news/2010/06/100608-gulf-oil-spill-birds-science-environment.

4. As early as April 30, President Obama had announced a moratorium on approving new leases for offshore rigs, but his May 27 extension of the moratorium for another six months was clearly tied to the new information emerging on the magnitude of the spill from webcam-based calculations.

5. See Janet Raloff, "BP's Estimate of Spill Rate Is Way Low, Engineer Suggests," *Science News*, May 19, 2010, http://www.sciencenews.org/view/generic/id/59381/title/BP%E2%80%99s_estimate_of_spill_rate_is_way_low,_engineer_suggests.

6. The Norwegian study was called "Project Deep Spill"; US groups extending these findings are from the University of South Florida and the University of Mississippi. "I got lambasted by the Coast Guard and NOAA when we said there was undersea oil,' USF marine sciences dean William Hogarth said. Some officials even told him to retract USF's public announcement, he said, comparing it to being 'beat up' by federal officials." Craig Pittman, "USF Says Government Tried to Squelch Their Oil Plume Findings," *St. Petersburg Times*, August 10, 2010.

7. See the extensive and well-sourced Wikipedia entry "Deepwater Horizon Oil Spill," last modified September 28, 2010, especially the articles referenced in notes 171 (Mark Guarino, "In Gulf Oil Spill, How Helpful—or Damaging—Are Dispersants?," *Christian Science Monitor*, May 15, 2010), and 175 ("US Oil Production, Shipping Unaffected by Spill So Far," Agence France-Presse, May 1, 2010).

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NOTES

1. The full quote is: "My 'models' have all already modeled for someone else. There are no virgins here." Marlene Dumas, in Rudolf Yvenhuis, Eugene van den Bosch, and Joost Verhey, *Miss Interpreted* (1992), a documentary film produced by the Stedelijk Van Abbemuseum, Eindhoven, the Netherlands.

2. Marlene van Niekerk, "Mass for the Painter," in Emma Bedford and Marlene Dumas, *Marlene Dumas: Intimate Relations* (Johannesburg and Amsterdam: Jacana and Roma, 2007), 112.

3. *Measuring Your Own Grave* is the name of the 2003 painting that lent its title to the artist's 2009 retrospective at New York's Museum of Modern Art and other venues. The signal image is of a woman bending over and reaching out to touch the edges of the canvas.

4. Dumas writes: "My fatherland is South Africa; my mother tongue is Afrikaans," in "Home Is Where the Heart Is" (1994), reprinted in Dominic van den Boogerd et al., *Marlene Dumas* (London: Phaidon, 1999), 130.

5. Dumas follows the lines of my opening epigraph with these words: "Painting is the trace of the human touch. It is about the skin of a surface." Marlene Dumas, "Women and Painting" (1993), in *Sweet Nothings: Notes and Texts*, ed. Mariska van den Berg (Amsterdam: Galerie Paul Andriesse, 1998), 75.

6. Cited in Marina Warner, "The Slipped Chiton," in *Monuments and Maidens: The Allegory of the Female Form* (New York: Atheneum, 1985). Warner notes: "The word *sale* (dirty) recurs in the abuse. He had made Liberty look like a filthy creature." "A dirty and shameless woman of the streets" and "the most shameless prostitute of the dirtiest streets of Paris" are two critics' comments cited by Marcia Pointon in her classic essay "Liberty on the Barricades: Woman, Politics and Sexuality in Delacroix," in *Naked Authority: The Body in Western Painting 1830–1908* (Cambridge, UK: Cambridge University Press, 1990), 68.

7. *Ubuntu* is the Xhosa notion that "a person is a person through other persons." Famously and repeatedly cited by Archbishop Desmond Tutu, it became almost a national slogan during South Africa's transition to democracy in the early 1990s.

8. Jacques Derrida, *On Touching: Jean-Luc Nancy* (Palo Alto, CA: Stanford University Press, 2005), 186.

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