



BOOK REVIEWS

Oil Spills, J. Burger, 1997. New Brunswick, New Jersey: Rutgers University Press, 262 pages with 38 b&w illustrations. (Hardcover, \$29.95, ISBN 0-8135-2338-9).

When presented with the opportunity to review **Oil Spills** by Joanna Burger, I felt that it would be an easy, informative and relatively painless task. This was not to be. A positive review can be succinct; criticism must be validated. Although I did enjoy parts of the book, I also found parts to be disturbing enough to question the overall accuracy and real purpose of the book. Because of the negative perspective developed reading **Oil Spills**, this book review will be presented in two parts: the author's summation and the reviewer's critique. The first is a summary statement of the book and its fourteen chapters primarily quoted or paraphrased from the book or the publisher's press release. The second is a discussion from the reviewer's perspective focusing on inaccurate or unsubstantiated statements, self-promoting remarks, and non-academic procedures or style. Perhaps some of the reviewer's negative comments would have been mollified if there had been a statement from the author or publisher to the effect that this book was written for the general community and was not a comprehensive, scientific treatise on oil spills.

The press release for **Oil Spills** states that this "is the first book to survey the history of oil spills, the problems they create, the types of clean-ups and their efficacy, and the legal, social, economic, and ecological consequences of oil spills," as well as to examine "... the long-term effects of spills on the wildlife and people who survive them, as well as the alternatives to oil and its transport." The author is a professor of biological sciences and a member of the Environmental and Occupational Health Sciences Institute at Rutgers University and has authored several books on the topic of oil spills. **Oil Spills** consists of fourteen chapters summarized below:

Chapter 1. "Introduction" consists of a very brief statement putting oil and oil spills into perspective, followed by the author's "come with me" description of two oil spills, one small (Arthur Kill) and one large (*Exxon Valdez*).

Chapter 2. "A Brief History of Oil" provides geographical insight on patterns of oil production and consumption, transportation methods and the sources of oil spills.

Chapter 3. "Early Oil Spills: From *Torrey Canyon* to the Mid-1980s" summarizes the size, conditions, cleanup tactics and environmental effects of four major spills: the *Torrey Canyon* spill off England in March 1967, the *Florida* barge accident at West Falmouth, Massachusetts in September 1969, the *Amoco Cadiz* off Portsall, France in March 1978, and the *Ixtoc 1* blowout in the Gulf of Mexico near Carmen, Mexico in June 1979.

Chapter 4. "Modern Oil Spills: From the *Exxon Valdez* to the Present" focuses on the *Exxon Valdez* spill in Prince William Sound, Alaska in March 1989 and a smaller, more localized oil spill "in the author's backyard," the oil spill in Arthur Kill, New York Harbor during January 1990. The more current oil spills discussed include: The Gulf War, Kuwait during 1990-91; Komi oil spill, Siberia, Russia in early 1994, and the *Sea Empress* off Milford Haven, Wales in February 1996. Lessons learned from previous oil spills are also summarized in Chapter 4.

Chapter 5. "Oil Spills in an Environmental Context" is a short discussion of toxic chemicals and the vulnerability of organisms and ecosystems to these chemicals.

Chapter 6. "Initial Responses to Oil Spills" and Chapter 7 "Cleanup, Rehabilitation, and Damage Assessment" deal with the operational methods used to deal with oil spills, legal considerations and damage assessment.

Chapters 8 through 12 cover the effects of oil spills on plants and animals including humans. Respectively, these five chapters focus on vegetation, invertebrates and fish, birds, mammals and sea turtles, and humans.

Chapter 13. "Hazard, Risk, and Perceptions" is a brief description of risk assessment, the relationship between risk and the perception of risk and how our perceptions will affect future oil spill cleanup.

Chapter 14. "Alternatives and the Future" provides a short description of alternative energy sources, discussion of preventive methods and insights into the future.

As a person with a tremendous interest in and a modest amount of experience with oil spills, I found parts of the book to be informative. However, I was disappointed after reading the very daunting buildup in the press release and back flap of the book cover and believe the book has problems both in substance and style. As mentioned previously, my major disappointment came from a scientific perspective. If **Oil Spills** was written for the general public, the review would have been less critical. Nonetheless, problems of substance are not dependent upon the book's audience. Perhaps I am overemphasizing the book's shortcomings, but the number is sufficient to make them not only annoying but, in their totality to suggest deeper, more serious problems.

There is definitely too much repetition of material and an inordinate amount of focus on a small spill (obviously the one the authors knows best) in Arthur Kill, "a small waterway that separates Staten Island, New York, from New Jersey (p. 5)." Although a good list of references is provided as "suggested readings" for each chapter, **there are NO references cited in the text and painfully few with the figure captions and**

tables! None of the following figures or tables referenced the source of the data and were not compiled by the author: Figure 2.12 (p. 32); Table 4.1 (p. 54); Table 6.3 (p. 104); Table 13.1 (p. 203); and Figures 14.8 and 14.9 (p. 223). The author does not cite sources for Figure 5.1 (p. 82) and Figure 14.12 (p. 226) but the references are located in reference sections for chapters other than where the figures are cited in the text. There are also problems of clarity or understanding of several of the authors' figures. Figure 4.10 is labeled as a photograph of a "fiddler" crab although it appears to be a blue crab rather than a fiddler crab. Note that the crab in Fig. 4.10 has both swimmerets and a set of large pinching claws. A fiddler crab has neither. The boom illustrated in Figure 7.1 (bottom of p. 112) is a sausage boom used to collect sheen by absorption and not to "prevent oil from coming in." Similarly, Figure 7.3 (p. 113) illustrates a containment boom used to inhibit the movement of oil-on-water and is tended (re-positioned), not "changed." Figure 7.4 (p. 116), a photograph of "high-pressure cleaning of beaches," is also misleading since the foreground and main focus of attention is on low-pressure flushing and not high-pressure cleaning. High-pressure cleaning is evident in the background where cleanup personnel are working along the water's edge. Figure 9.1 (p. 140) serves more to confuse than support the accompanying statement on p. 139 that "Life in the seas can be divided into the pelagic environment and the benthic environment." Pelagic is not even noted in the figure! The caption for Figure 10.1 (p. 156) states that gulls "serve as an early warning of environmental contamination." If this were correct then why do so many gulls congregate around landfills and in polluted urban harbors, such as in Boston where the overpopulation of sea gulls resulted in thousands being destroyed. Figure 10.2 (p. 159) is truly confusing and does not adequately represent a viable food chain.

Many of the author's statements are questionable at best and either require further elaboration or reference citations to back up the statements. I recognize the difficulty of trying to cover such a wide and comprehensive range of topics on oil spill in a relatively short book. However, if the author professes to address the many complex issues of oil spill cleanup, social, economic and ecological consequence, long term effect as well as alternatives to oil transport, then the onus is on her to do so both properly and professionally.

Most of my problems with specific statements came in the first chapter, although others were evident in later chapters. The following discussion includes quotes from the book and a brief discussion of what I felt was wrong with the statement.

p. 4—"Top predators are usually the first to disappear with environmental degradation and pollution." Perhaps from a visual impact this statement is true, but it is the food chain that is first to go. The statement is misleading.

p. 5—"For me, the presence of a functioning ecosystem is proof that the system is not polluted beyond repair or sustainability (Fig. 1.2)." I question this statement along with the snapshot (Fig. 1.2) of the author posing in a salt marsh five years after an oil spill. Just because the marsh grasses are back does not substantiate that the ecosystem has been

totally repaired. There is also a question of recovery time. Given enough time, most ecosystems will repair themselves, but how long for complete recovery is acceptable?

p. 8—"Near the edge of some glaciers the pack ice is so thick that most marine mammals avoid it. Only the small, dark-gray harbor seals, known locally to some as glacier seals, find this home." There are two problems with this: first, there is no "pack ice" in Prince William Sound. Pack ice is found off the north coast of Alaska and is formed from sea ice that has existed for several years. Pack ice is also not very thick (often less than 2 meters). The ice in Prince William Sound is "so thick" because it is glacier ice, formed on land from fresh water, moved out to sea, separated from the glacier by calving, and floating like an ice cube with approximately 9/10 of its volume, actually density, below the water surface. Second, the inference that "harbor seals" are the only marine mammals to inhabit Prince William Sound is incorrect. In fact, Prince William Sound is known for its abundance of marine mammals including, a variety of baleen whales, several toothed cetaceans, sea lions and sea otters.

p. 15—Something appears to be missing from the oval shaped form connecting crude oil to its products in Figure 2.1. If nothing is missing then why is it oval? Is it what the author refers to "elaborate refining processes" when citing Fig. 2.1 in the text?

Other disconcerting quotes from other chapters are the following:

On page 81–82 the author, in referring to natural oil seeps, states "Seepages do not occur in all types of rock, but are limited to sedimentary and metamorphic or igneous rocks closely associated with sediments." Although the statement is marginally correct, it is very misleading. Oil and oil deposits are never formed in metamorphic or igneous rock nor are oil traps associated with metamorphic or igneous rock. Oil deposits are sedimentary in origin, and although some oil traps are the result of faulting, major metamorphic or igneous rock forming processes will destroy oil deposits.

On p. 82 the author quotes, "Diminishing oil seep rates in the Santa Barbara Basin, offshore of California, are directly related to commercial drilling in the area." This would be true if artificial recovery techniques to increase the underground pressure in the oil trap were NOT used, but they are and, I believe, similar recovery techniques were used offshore Santa Barbara. These artificial recovery techniques, such as pumping salt water back into the oil well, increase the underground pressure and thereby increase natural oil seep rates as well as increasing oil recovery.

On p. 130 the author states, "The most devastating effects from oil spills often occur at the leading edge of marshes and mangroves. . . ." This statement appears to be contradictory to the author's earlier statement on the same page that ". . . only the leading edge is exposed to daily tidal inundation sufficient to wash away pollutants. Oil and other pollutants that reach the back edges seep deeper into the muds or peat and remain for years or decades."

In the author's discussion of geographical locations of

chronic spills she refers back to Figures 2.8 (p. 28). Unfortunately Figure 2.8 presents the annual number of spills by size and has nothing on geographic location of spills.

The author says that an oil spill "... killed miles of mangroves ... (p. 137)." A more accurate statement would present this in area measurements and not a just linear distance.

The author also states, "The (Arabian) Gulf is one of the busiest oil transport arteries in the world—half of the world's oil passes through this region ... (p. 149)." How can the Gulf be just "one of the busiest oil transport arteries" when half of the world's oil passes through this region? If the author's statement is correct, then the Gulf must be THE busiest oil transport artery since the other half must be divided amongst all the rest of the oil transportation arteries!

On mortality estimates the author states, "Unlike most other groups of animals there are accurate counts of dead birds ... (p. 156)." This is a bit questionable unless qualified since these "accurate" counts of dead bodies are always the minimum mortality. Total mortality numbers are projections from minimum numbers of individuals (MNI) and therefore always estimates as mentioned on pp. 165–166. A more accurate mortality estimate of bird mortality is possible but actual numbers are not!

In discussing mammals, the author states that marine mammals include "... polar bears, which live in the tundra (p. 179)." Although it is true that polar bears spend most of their lives on sea ice, they require land to give birth and for many other activities; it is questionable whether they are "marine mammals." And if they are marine mammals, would they "live in the tundra"?

There are problems with the writing style. For example, the author uses the personal pronoun "I" at the beginning of almost every chapter and when trying to impress the reader,

such as on p. 134 where she states, "In some places, the effect is obvious to me only because I know every detail of the creeks and marshes." I question statements by the author such as in a discussion of the author's upcoming trip to Alaska in which she states "The trip is daunting, since I recently broke my ankle while in Indonesia, and the cast came off only days before I am to leave for Alaska (p. 7)." Am I supposed to be impressed that the author just came back from Indonesia? Feel sorry for her? Marvel at her stamina and professional dedication? The statement is inappropriate in a scientific publication. The author also states, "All of the photographs were taken by the author unless otherwise noted in the caption." However, several photographs are of the author in the field, and although the photographs could have been taken using a timer on a camera, they were more likely taken by a colleague. Also her "field attire," including rings on every finger, in these photos (Figures 1.2 and 12.1) does not instill one with much confidence that she is "field savvy" or had any intention of actually getting up close and personal with an oil spill.

Does any one or two of my above criticisms make the book useless? No, but in their entirety they do make other statements by the author suspect. Although the author may be a respected authority on certain aspects of oil spills and a good scientist, she has lost credibility by her shoddy presentation in *Oil Spills*. Am I being too picky on some of these points? Of course, but I feel that the examples cited—and there are others—suggest that this book did not receive the scholarly attention or critical review required to make it a significant contribution to the topic being addressed.

Anthony J. Lewis
Louisiana State University
Baton Rouge, Louisiana



BOOKS, JOURNALS AND REPORTS RECEIVED

BOOKS RECEIVED

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- Otvos, E.G., 1997. **Guidebook, Louisiana to Northwest Florida Field Trip. Northeastern Gulf Coastal Plain Revisited: Neogene and Quaternary Units and Events—Old and New Concepts.** New Orleans, Louisiana: Gulf Coast Association of Geological Societies Annual Meeting (18–19 October 1997), 143p.
- Wolf, F.C.J., 1997. **Hydrodynamics, Sediment Transport, and Daily Morphological Development of a Bar-Beach System.** Utrecht: The Royal Dutch Geographical Society, Faculty of Geographical Sciences, Utrecht University, 276p. ISBN 90-6809-252-9. Dfl 40.00 post paid.
- Acta Oceanologica Sinica (Chinese Journal of Oceanology)**, 1997, Volume 19, Numbers 3 and 4. The Library of Chinese Academy of Sciences, 8 Kexueyuan Nanlu, Zhongguancun, Beijing, China.
- Oceanologica Acta (European Journal of Oceanology)**, 1997, Volume 20, Number 5. Gauthier-Villars, 141 rue de Javel, F-75747 Paris Cedex 15, France.