NEHRP. After holding two congressional hearings on hazards risk reduction, the House passed the Natural Hazards Risk Reduction Act of 2009 (H.R. 3820) on March 2, 2010. The bill reauthorizes NEHRP and the National Windstorm Impact Reduction Program.

The bill passed in the House by a vote of 335 to 50. However, NEHRP’s non-partisan nature has not been enough to spur consideration of the measure in the Senate. The bill is languishing in the Senate Commerce, Science and Justice Committee. This is partly due to the fact that the oil spill in the Gulf of Mexico has taken the forefront in both chambers of Congress since the explosion of the BP Deepwater Horizon oil rig on April 20, 2010. The American public’s memories of the Haiti and Chile earthquakes have quickly faded and offer no momentum to moving NEHRP reauthorization forward in the Senate. The unfortunate reality is that catastrophic events can invoke an immediate reaction, but this sentiment does not last long enough for policy development.

While Congress might not consider NEHRP and earthquake preparation a priority, there are plenty of geoscientists, emergency response officials and individuals who do. The Southern California ShakeOut of 2008 and the upcoming October 21, 2010 Great California Shakeout are testament to this. These earthquake awareness programs are intended to get schools, businesses, communities, and individuals engaged in preparation. The program cumulates in a statewide earthquake drill. The ShakeOut is generally considered a successful program because it has been able to reach millions of Californians, due in part to its social media campaign. There is also a ShakeOut planned for April 28, 2011 in the Midwest as part of the year-long bicentennial commemoration of the New Madrid earthquake. This is especially important because the central U.S. is not considered earthquake country and communities are less aware of earthquake risks, despite the area’s seismic past.

It is important to note that the Southern California Earthquake Center and the federal agencies who are organizing the California ShakeOut events are partially funded by NEHRP. While it is the responsibility of individuals and local communities to prepare for earthquakes and other hazards, information about the hazards and how to prepare for them requires a top-down procedure as set forth in the objectives of NEHRP. The public cannot be informed if the agencies at the top are unable to meet their goals and objectives. Residents of Seattle cannot prepare for a natural hazard if they do not know the disaster scenario they may face.

Unfortunately, the Senate gridlock cannot stop a major earthquake from striking Seattle, Los Angeles, or even Memphis. When the “Big One” happens, millions of Americans will face days or weeks without a steady source of drinking water and food as predicted in the Southern California earthquake scenario. While fatalities may be limited, thanks to strong building codes, infrastructure will be heavily damaged. Federal emergency response will be robust, but hampered by logistical challenges and a lack of preparation.

The NEHRP program cannot stop earthquakes from happening, but it can help Americans prepare and respond to limit the damage. Many studies have shown that mitigation saves lives, structures and costs. Reauthorizing NEHRP would help to ensure an improved understanding of earthquakes, robust and appropriate infrastructure, and better preparation, adaptation and response. While the NEHRP legislation does not garner national headlines today, it should be a priority for consideration by the U.S. Congress now because the program is effective, non-controversial and timely. Acting now to avoid catastrophe would save Congress and the nation from reacting suddenly and ineffectively later.

Collective Amnesia: The History of Oil Spill R&D

By: Elizabeth G. Huss

“It’s déjà vu all over again.” –Yogi Berra

As a result of a blowout, explosion, fire and collapse of the BP Deepwater Horizon drilling rig on April 20, 2010, about 4.9 million barrels of oil leaked into the Gulf of Mexico1. Congress and the administration are investigating numerous contributing factors for the catastrophe including: failure of the blowout preventer, problems with the cementing, anomalies in the drilling, concerns with BP’s maintenance and with Minerals Management Service’s (now the Bureau of Ocean Energy Management, Regulation and Enforcement) oversight, as well as a lack of sufficient risk management and risk response. Congress is considering regulation, oversight, management, and research and development (R&D) to improve oil spill prevention and response. In order to consider what to do about R&D it is necessary to know about past efforts and how effective they have been.

Following the Exxon Valdez oil spill in 1989, Congress passed the Oil Pollution Act of 1990 (OPA) to prepare, adapt, mitigate and respond to future oil spill problems. The Minerals Management Service (MMS) developed a specific Oil Spill Research Program. The program was established during fiscal year 1993 in accordance with Title VII of OPA. The program’s objectives are “to promote increased oil spill response capabilities” and “increase the understanding of the oil spilled and the effects occurring within the marine environment.” Since the establishment of the program, the funding has remained fairly steady, hovering between six and seven million dollars, according to MMS budget documents. About 25 percent is for salaries and operating expenses at MMS, 25 percent for the operation and maintenance of Ohmsett—the nation’s only full-scale oil spill response testing, research, and training facility—and the rest, about $3 million, is for research projects.

Other federal organizations support oil spill research. Under the National Contingency Plan (NCP) the U.S. Environmental Protection Agency (EPA) is responsible for understanding and regulating the use of chemical dispersants in the BP oil spill. The amount and the way the chemical dispersants have been used have caused considerable controversy, partly because the composition of the dispersants is proprietary, making it difficult to conduct research, and because there seems to be little information about how the dispersants affect the marine environment. The EPA tested the toxicity of the eight authorized dispersants after the oil spill. EPA confirmed that the dispersant used by BP, Corexit 9500A, is generally no more or less toxic than the other seven dispersants, and the dispersants mixed with oil are no more toxic to marine life than oil alone.

1. According to a federal interagency committee assembled by the National Incident Command and led by Energy Secretary Steven Chu and USGS Director Marcia McNutt. To access the report, go to http://www.noaanews.noaa.gov/stories2010/PDFs/OilBudget_description_83final.pdf.
Some scientists have questioned whether these tests are sufficient and have called for more research.

Beginning in 2004, the National Oceanic and Atmospheric Administration’s (NOAA) Office of Response and Restoration (ORR) provided $1.5 million in oil spill R&D projects every year. The University of New Hampshire’s Coastal Response Research Center (CRRC), established in partnership with ORR, published a report in 2005 stating the need for a better understanding of dispersed oil fate and effects. Thus there have been calls for more federal R&D on oil spills after the Exxon Valdez accident and again after the establishment of a new R&D program through NOAA.

The U.S. Coast Guard has a “Spill Research and Development Program.” According to a 2008 report, Systems Analysis of Oil Spill Response, tens of millions of dollars of the Coast Guard’s funds have been invested in an oil spill R&D program over the past 50 years. In reality, Coast Guard funding has hovered around $3.5 million annually, and is funneled into many different areas, including waterway management, sensor systems, as well as oil spill clean up and response. The National Science Foundation (NSF) also awards grants for oil spill research, but because of NSF’s mission of basic research, these grants tend to be reactionary and short-term, rather than proactive and able to study longer term effects.

Of course, industry has and should sponsor oil spill R&D. The industry has several organizations set up for spill technology research. The American Petroleum Institute (API) has several reports on preventing and planning for oil spills, and oil companies fund research conducted by The Foundation for Scientific and Industrial Research at the Norwegian Institute of Technology (SINTEF). The Petroleum Environmental Research Forum (PERF) allows industry to exchange and analyze research on different technologies, and helps set up joint research projects for the industry. According to testimony from congressional hearings, Exxon Mobil spends $50 million a year on spill response and deepwater drilling research, and ConocoPhillips spent $1.3 million over three years on safer drilling technologies.

Recently several major oil companies committed $1 billion towards a plan to engineer and deploy a rapid response containment effort for wells in up to 10,000 feet of water in the Gulf of Mexico. The system will be able to mobilize within 24 hours, and will have the advantage of being constructed and pretested. Although BP has not contributed to the containment system, the company has allocated $500 million for independent researchers to study the effects of the spill over the next 10 years. In addition, the non-profit X-Prize considers the problem of an oil spill to be significant enough to establish the $1.4 million Wendy Schmidt Oil Cleanup X CHALLENGE, a competition designed to inspire engineers, entrepreneurs, and scientists to develop new spill clean up technologies.

In the National Academies’ 1993 Review of the Interagency Oil Pollution Research and Technology Plan, the committee notes the “boom and bust” cycle of oil spill response research. Once an incident has faded from public and political focus, funding and oversight also fade. The amount of money delineated for spill response has not been adequate, and for evidence we need to look only as far as the BP oil spill. The well was not capped until July 15, almost three months after the initial explosion. Stories of failed attempts of containment domes and junk shots and warnings that these remediation efforts have not been tried in deep water dominated headlines as the response stretched from weeks into months. Along with failures to control the flow of oil came adjustments to the estimate of the amount of leaking oil. Original estimates of 1,000 barrels per day turned into 60,000 barrels per day two months later.

Amid the public outcry, Congress held hearings to consider the response effort. The general consensus: there were not adequate funds set aside for an event of this magnitude. During the hearings, witnesses suggested changes to make spill response more effective. Scientists who testified asked that more funding be given to study spill response technology, and that if a spill does occur, then researchers should be involved in remediation immediately. In one hearing, Dr. Nancy Kinner, co-director of the CRCC, made several suggestions to improve oil spill R&D, including: (1) improve peer review; (2) improve translation of research into practice; and (3) better coordination between agencies funding and conducting research. Dr. Samantha Joye, from the University of Georgia’s Marine Sciences program, identified a more basic and immediate need for more widespread use of proper sampling and monitoring equipment, such as optical sensors, acoustic systems, and Teflon-lined sampling bottles, by all entities involved in research and assessment. Scientists agreed almost universally that better long-term monitoring efforts are necessary.

OPA envisioned a robust oil spill R&D program, but the program has fallen short of expectations. “The industry has various vessels and equipment on standby used to contain spills, to skim, and to deploy dispersants. But quite frankly, the research in this area has been lagging and as evident was not prepared for this past incident,” testified James Pappas, vice president of technical programs for the Research Partnership to Secure Energy for America (RPSEA). The OPA created the Interagency Coordinating Committee (ICC) on oil pollution research. The ICC was responsible for developing an oil spill R&D plan and promoting cooperation between industry, government, universities and research centers. Although a plan was created and R&D funding for states and universities was authorized, after the initial infusion of money immediately following Exxon Valdez, additional funds were never appropriated. The OPA authorized up to $22 million for

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Elizabeth Huss with her representative, Representative Paul D. Tonko (NY-21st).
oil spill R&D, but federal agencies have not supported R&D anywhere near that level. The National Academies reviewed the plan and made suggestions in the 1993 report. The suggestions included: (1) the development of a program for field testing; (2) the examination of public perception related to spill response; and (3) a review of past and present spill R&D efforts internationally.

Similar to the aftermath of Exxon Valdez, there is currently pressure to write and pass legislation to improve oil spill R&D. The House has passed the Oil Pollution Research and Development Program Reauthorization Act of 2010. The act would amend the OPA to direct the president to create the Federal Oil Spill Research Committee, tasked with similar objectives as the ICC. The objectives establish a program to conduct oil spill R&D, name the priorities of this research, and submit a report to Congress on the status of oil spill prevention and response capabilities. The bill would require NOAA to award competitive grants to universities and research institutions for oil spill research, along with asking the National Academies to report on the status of federal oil spill R&D. The bill has been referred to the Senate Committee on Commerce, Science, and Transportation, where no action was taken before the August recess.

There were few discussions about the effectiveness, innovations and knowledge gained from oil spill R&D before the BP accident, and it appears the Exxon Valdez experience is being repeated with the same general questions and concerns. Authorization of spill R&D programs has been insufficient. Funding from federal agencies has been relatively meager for the past twenty years and even the funding appropriated for oil spill R&D has sometimes been diverted to other priorities. Both the OPA and the reauthorization of OPA that is being considered in Congress right now provide clear objectives and plans. Science and technology can be cost-effective approaches to prevent spills and to better prepare for and better mitigate an oil spill. Government, industry, academia, and the public need to maintain a steady and long-term commitment to well-laid plans for oil spill R&D.

**Unable to Break the Ice: U.S. Arctic Policy and Law of the Sea**

*By: Kiya L. Wilson*

There is little doubt that climate change is rapidly altering the Arctic environment. Studies have found that in the high north, multi-year sea ice extent is shrinking, making the Arctic somewhat more accessible for research, natural resource exploration, and navigation. Arctic seabed hydrocarbon resources are receiving particular attention from the international community as global demand for oil continues to increase. In 2008, the U.S. Geological Survey (USGS) estimated that the Arctic Circle contains 90 billion barrels of undiscovered but recoverable oil and 1,670 trillion cubic feet of undiscovered natural gas, most of which is offshore. As the political and physical climate of the Arctic heats up, there is growing need for the United States to fund Arctic research mapping, update the Coast Guard’s aging icebreaker fleet, and ratify the United Nations Convention on the Law of the Sea so that the nation can be engaged scientifically and politically in the Arctic. Since taking effect in 1994, the third United Nations Convention on the Law of the Sea (UNCLOS) has delineated the rights and duties that countries have with respect to navigation, ocean environmental protection, piracy, marine scientific research and the use of living and non-living resources of the ocean and seafloor. Recent changes in the Arctic have brought increased attention to the portion of the convention concerning a state’s sovereign rights to its continental shelf. UNCLOS establishes an Exclusive Economic Zone (EEZ) that extends 200 nautical miles from a nation’s coast. If the continental shelf of a country extends beyond these 200 nautical miles, however, it can claim additional territory. On this ‘extended continental shelf,’ states have the rights to seafloor resources such as benthic organisms, seabed minerals, and most importantly, hydrocarbons. For a signatory nation to extend its territory, the state must submit a claim based on geologic data to the United Nations Commission on the Limits of the Continental Shelf (CLCS) within ten years of ratifying the convention. This claim is then reviewed by scientists from other signatory countries. The U.S. is the only Arctic country, and one of only a handful of countries worldwide, that has not ratified the convention. While a non-party country may attempt to delineate their own extended continental shelf, the limits of that territory will not be recognized by the international community without ratification of the treaty and subsequent formal recommendations from the CLCS. The U.S. cannot be part of CLCS deliberation regarding other countries claims and cannot submit its own claim without first ratifying the convention. President Bill Clinton signed UNCLOS in 1994, and despite widespread bipartisan support for the convention, the Senate has not ratified it. Opposition from several key Senators has blocked ratification, as has the expectation that debate on the Convention would require at least a week of Senate floor time.

As the U.S. delays action on UNCLOS, other countries are submitting their claims to the CLCS. In 2001, Russia submitted its extended shelf claim, which included the seafloor at the North Pole. Russia claimed, based on geologic data, that the Lomonosov ridge connects its coast with the North Pole. Following the claim, a Russian submarine planted a tiny Russian flag on the seafloor at the North Pole. This ‘land grab’ move was politically insignificant, but received considerable media attention. As of August 2010, Norway, Russia, and Denmark have all submitted at least partial continental shelf claims, with Canada and the U.S. remaining as the only Arctic countries that have not.

Although the U.S. cannot submit its claims to the CLCS without ratifying the convention, there have been recent efforts to map the extended continental shelf in preparation of a submission to CLCS. Over the summer and fall of 2010, the USGS, in collaboration with Canadian researchers, will map each country’s extended continental shelves in the Arctic. “Because there is an area with considerable overlap between the U.S. and Canadian extended continental shelves, it makes sense to share data sets and work together in the remote and challenging environments of the Arctic Ocean,” said USGS scientist Deborah Hutchinson. This is the third summer that the U.S. and Canada have collaborated in data collection, but is the first time that researchers have ventured into disputed territory. The exact border between Canada and the U.S. in