Testimony of Kathrine Springman, Assistant Editor, Marine Environmental Research before the Subcommittee on Energy and Mineral Resources and the Subcommittee on Insular Affairs, Oceans and Wildlife Joint Oversight Hearing on March 24, 2009

Mr. Chairman and members of the committee: My name is Kathrine Springman, and I'm a toxicologist who is here today to answer some questions about the biological effects of OCS oil drilling.

Other oil producing nations such as Norway have established more stringent controls on oil exploration and production, and these have been codified and enforced. Norway has a Zero Discharge Policy that has been in place for several years. A copy of some of this material is attached for your review.

Prior to drilling, Norway requires that baseline data be collected. These data describe what the area under exploration was like prior to exploration or extraction of any resources, and serve as a basis for comparison to evaluate the environmental performance of those who wish to drill. One of the biggest stumbling blocks to assessing damage is the lack of baseline data. Additionally, technologies to detect discharges and assess their affects on wildlife are now available, and have been tested. These technologies are another facet of what should be required. The presence of risk requires monitoring on a regular, repeated basis.

Thanks to methodical research in this area, we have learned a great deal about the effects of oil over some of the various time scales involved. Among some of the more salient points concerned how long oil can last in a form that is available for uptake by wildlife, and the type of damage that can result. In a recently-published study, fuel oil that was released in the 1964 Alaska earthquake was found by digging about 10 cm below the surface. This oil was bioavailable and capable of stimulating a pronounced enzymatic response in fish dosed with it. Oil associated with organic-rich source rock such as coal had no effect, as the hydrocarbons associated with it cannot be taken up by wildlife. Petroleum hydrocarbons from seeps do not travel far enough to affect any sampling or wildlife from sites that were used in this study, and any human effects were inconsequential. Non-point source pollution has been discussed as the primary source of coastal marine pollution, but that would depend on many of the same factors that impact the sensitivity of a site to drilling. It may be useful to examine the interactions of the various stressors found at specific coastal locations for both of these applications.

Identifying the risks involved in resource extraction prior to making a decision impacting numerous levels involves integrating knowledge and skills from various fields. One of the problems here is that we're just now beginning to learn crucial details about the interactions and behavior of wildlife and their interactions with their habitat, the effects of continuous, long-term hydrocarbon exposure, and the generational consequences of the interaction of hydrocarbons. Familiarity with the components of a system is necessary when assessing the potential risks. We're still acquiring the knowledge needed to make wise decisions having a long-range impact, and making them before the information to do so is available can have continuing effects for the areas in question and the wildlife involved. This requires extended studies to examine these target sites as the impact factors change. One of these is climate. Where climate changes, ecosystems will do the same. Their sensitivity to disruption may be one of the characteristics that alters.

Among the critical points in this discussion is the length of time for which an impacted area and its resources will be affected by drilling. There are several factors to consider: oil is a complex mixture of hundreds of compounds that degrade at different rates, and the composition varies with location. Petroleum hydrocarbons can manifest toxicity in various ways on a range of time scales. These compounds can elicit toxic effects on an acute time frame as well as affect wildlife for decades in subtle ways. Data strongly suggest that oil becomes more toxic on a volumetric basis as it ages as those compounds that remain are among the most toxic. Many of these remaining compounds are among the list of probable human carcinogens. Their toxicity can be manifested in wildlife as pronounced demographic changes in the wildlife of a region, and for long periods of time. The time required for recovery from one large incident or chronic, continuous exposure is uncertain, and depends on many factors including the definition of "recovery". This underscores the importance of baseline data prior to beginning any activity.

Another aspect to consider is that released oil is not the only concern in drilling. Drilling fluids and produced water can be toxic to wildlife when discharged, while drill cuttings can impact the characteristics of the receiving environment. Determining the risk depends on the quantity of the material discharged, its characteristics, the time over which the discharge takes place, the age of the production fields involved, the depth of the receiving area, the diffusion potential of the released material, the sensitivity of the receiving environment, and confounding factors such as hurricanes. Consequently, responsible stewardship requires that these differences be considered prior to permitting oil drilling in potentially sensitive areas. The Zero Discharge Policy prohibits discharges from sources other than sea water. Preventing pollution by refraining from it is a prudent policy.

In closing, many more factors need to be taken into consideration prior to allowing OCS drilling. Due to the variability of these issues, each site should be considered separately to minimize the risk of damage to the areas involved.