

A Report to the Century Commission for a Sustainable Florida | April 2010

Potential Impacts of Oil & Gas Explorations in the Gulf



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The Century Commission for a Sustainable Florida was created by the Florida Legislature in 2005. Administratively attached to the Florida Department of Community Affairs, the Commission is to annually offer to the Governor and Legislature recommended policies, plans, action steps, or strategies to realize a vision for a sustainable Florida on a 50 year planning horizon.

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During the 2009 legislative session, the Florida House passed HB 1219. Regulation of State Lands and Oil and Gas Resources. HB 1219 would have removed existing prohibitions against granting leases on state-owned submerged lands (i.e., state waters) and against granting permits to explore for and develop oil or gas resources in state waters.

By doing so, HB 1219 would have given the Governor and Cabinet, acting as the Board of Trustees of the Internal Improvement Trust Fund, authority over private uses of state-owned submerged lands. The Florida Department of Environmental Protection would have the power to issue permits for drilling, exploring and producing oil, gas and other petroleum products. The Florida Senate did not consider HB 1219 in 2009, so the bill did not become law. A similar bill introduced in the 2010 legislative session was being debated as this report was completed.

In the wake of the proposed legislation, an intense public debate has ensued regarding the potential risks and rewards of offshore drilling in Florida's state waters. The questions, concerns, and arguments that have been expressed echo those associated with a longstanding political battle over offshore drilling in the Eastern Gulf of Mexico where federal moratoriums remain in place. As the intensity of these debates escalated, the Century Commission for a Sustainable Florida began considering its role in contributing to a constructive discussion on the issue. In November 2009, Senate President Jeff Atwater called upon the Century Commission – along with Florida State University's Institute for Energy Systems and Economic Sustainability (IESES) and the Florida Legislature's Office of Economic and Demographic Research – to assist the Senate with a detailed and comprehensive review of the implications of offshore drilling.

In responding to the charge from Mr. Atwater, the Collins Center for Public Policy, which staffs the Century Commission, developed this report for the citizens of Florida. Research was conducted by Collins Center staff with the assistance of an expert advisory group. A companion website with additional information resources and associated links is available at <http://offshore.centurycommission.org>. This project may be considered a parallel initiative to the IESES Florida offshore energy symposia. Relevant presentations and reports collected by IESES are cross-referenced where appropriate.

The report is structured around four topics:

- **Regulatory Framework**
- **Resources, Economic Benefits, and Energy Independence**
- **Environmental Risks, Permitting and Accident Response**
- **Aesthetics and Opportunity Costs**

Each topic includes one or more questions and/or subtopics. With a major focus on existing prohibitions on offshore drilling in state submerged lands, it was often found that the most salient questions and answers could not be adequately addressed without reference to issues and data that pertain to federal waters in the Outer Continental Shelf (OCS) in the Eastern Gulf of Mexico. The answers rely upon the data and claims made through official government sources and peer-reviewed publications. Reports and assessments commissioned by stakeholder advocacy groups were also evaluated and considered when they offered relevant data or analysis otherwise unavailable. In doing so, attempts were made to qualify which estimates and/or claims were found reasonable and why.

The intent is not to provide definitive conclusions or recommendations but rather to constructively highlight what is known about the potential risks and rewards of offshore drilling, what is unknown or uncertain, and what assumptions, claims and/or conclusions are reasonable. Understandably, some questions for which precise answers were desired remained elusive because of uncertainties or lack of information. In response, there is limited speculation. Ultimately, judgment calls were made with respect to what was reasonable and fair to say and the Collins Center remains accountable for the content.

Your comments and feedback are welcomed.

STATE/FEDERAL REGULATORY INTERPLAY

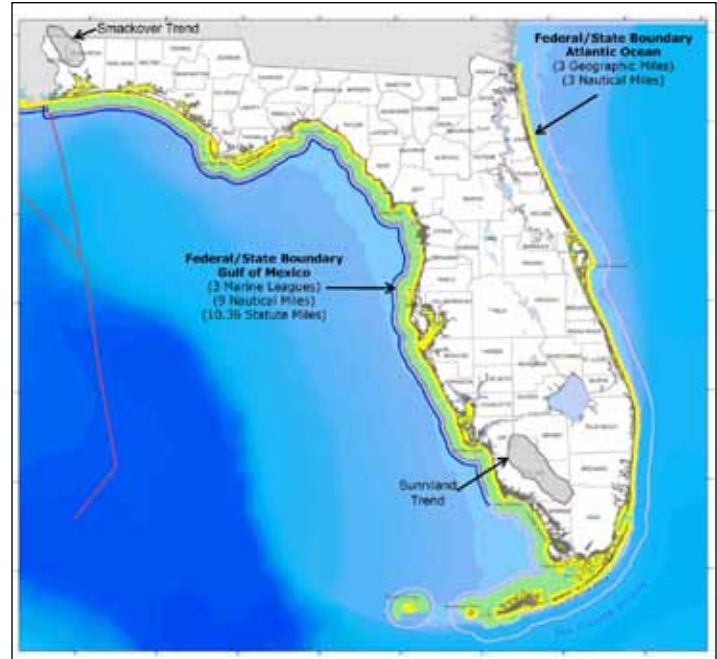
Q (1) Both federal and state governments have regulatory authority over oil and gas drilling. Who is in charge of what?

A With a few caveats, it's a matter of geographical boundaries. States have regulatory authority over submerged lands along their coastlines and the federal government has regulatory authority beyond that in an area known as the Outer Continental Shelf (OCS). States must comply with overarching federal environmental laws, and the federal government has an obligation to maintain policies that are consistent with states' coastal zone management plans. But as a general rule, states maintain authority over their submerged lands and the federal government maintains authority over the OCS.

With minor exceptions, Florida owns the seabed and its resources in the Gulf of Mexico from the mean high water line on the shore to a seaward boundary of 10.36 statute miles (9 nautical miles) and in the Atlantic to 3.45 statute miles (3 nautical miles). Title to this land and its resources is technically held by the Board of Trustees of the Internal Improvement Trust Fund in a special, public trust capacity. The Trustees hold proprietary authority over the submerged lands and are charged by the Florida Constitution to transfer out such lands only in the public interest. When the Trustees authorize use of these sovereignty lands or resources, they can put any restrictions or conditions they deem necessary on activities. The state also has enforcement authority to regulate those activities. The Florida Department of Environmental Protection (FDEP) is responsible for regulating oil and gas activities, but a lengthy period of inactivity due to state and federal drilling moratoriums has left a void in the policies and procedures for offshore regulation. This should be addressed if drilling activity resumes.

The Submerged Lands Act (SLA) of 1953, adopted by Congress to resolve the federal/state controversy over ownership of coastal resources, confirmed states' boundaries to 3.45 statute miles seaward of their coastlines and granted states title to the land and natural resources within those boundaries. With respect to Texas and Florida, the U.S. Supreme Court confirmed in 1960 that the SLA contained exceptions that recognized ownership and boundaries of these states to 10.36 statute miles in the Gulf of Mexico. Beyond state waters, the federal government has jurisdiction over the resources of the Gulf to 230 statute miles in an area known as the Exclusive Economic Zone. With regard to oil and gas development of the continental shelf, the Outer Continental Shelf Lands Act (OCSLA) and the National Environmental Policy Act (NEPA) are the most relevant authorities. This legislation is administered by the Minerals Management Service of the federal Department of the Interior.

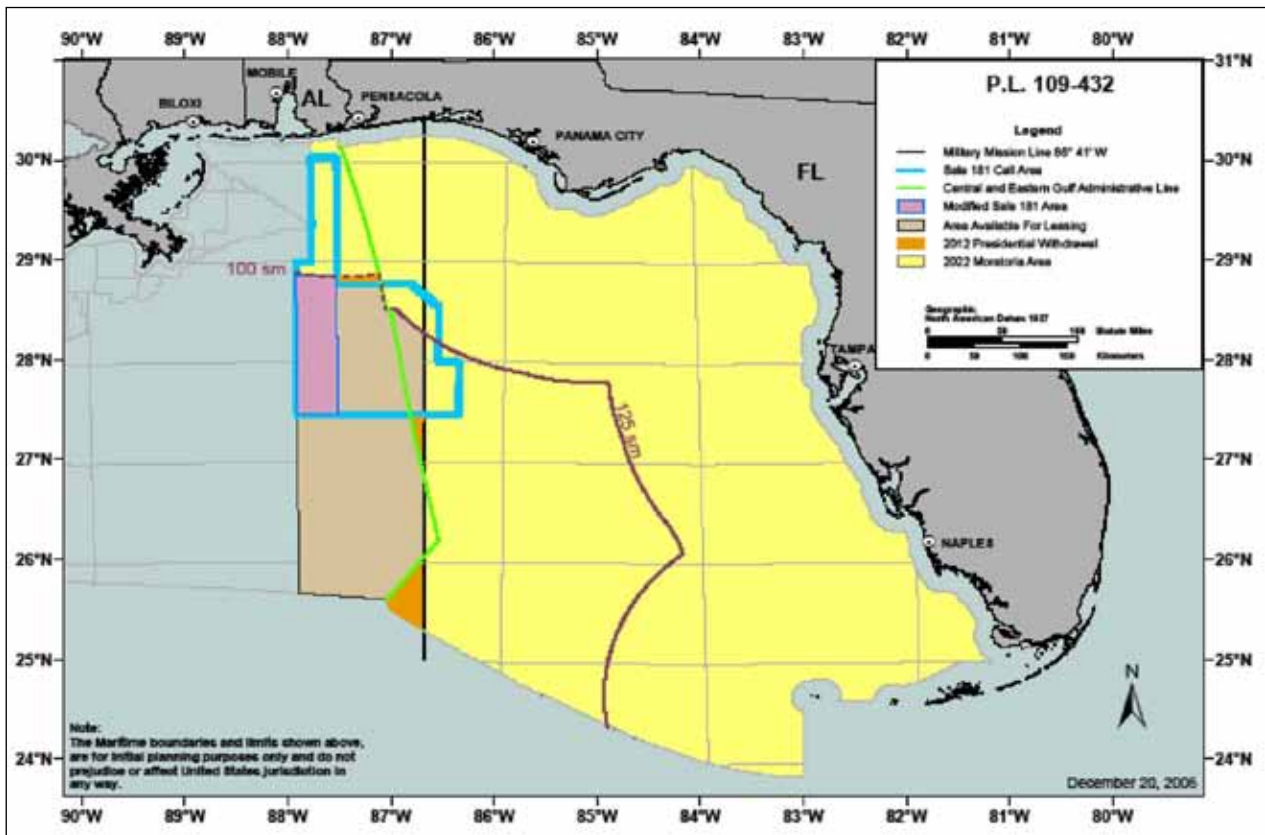
The designation of the boundary for ownership of resources does not, however, mean that management of the resources of state or federal waters is exclusive to those governmental entities. In the SLA, Congress provided that the U.S. retained its "navigation servitude and rights and powers of regulation and control ... for the constitutional purposes of commerce, navigation, national defense, and inter-



national affairs," even in state waters. Through this authority, federal legislation, such as the Rivers and Harbors Act, the Endangered Species Act, the Marine Mammal Protection Act, the Clean Water Act, and the Clean Air Act, applies to activities within state boundaries. NEPA requires the federal government to consider the environmental impacts of any proposed federal actions or activities of its lessees on state lands and resources as well as on the seas within federal jurisdiction. The OCSLA further provides opportunities for state input on OCS leasing and development.

The Coastal Zone Management Act of 1972 (CZMA) is perhaps the most important tool for the state in assuring that its concerns are considered. Federally licensed activities that affect the land, water or natural resources of the coastal zone may not go forward unless they are consistent with a state's federally approved coastal zone management program. Florida's coastal zone management program was approved in 1981 and incorporates 23 state laws governing resources, the environment and sovereignty lands. The MMS may not issue drilling permits for OCS exploration or development and production if an affected state objects to the activity as inconsistent with its coastal zone management program. A lessee may appeal this "state veto" to the U.S. Secretary of Commerce, however, and the Secretary may allow the activity to proceed if it meets a strict set of requirements that establish its consistency with the objectives of the CZMA or it is deemed necessary in the interest of national security.

SOURCES: Submerged Lands Act 1953; Outer Continental Shelf Lands Act; Department of Interior 2005 review of Submerged Lands Act; FDEP staff research; FDEP 1994 memo on regulatory jurisdiction; Florida House of Representatives; IESES Symposium I



Source: Gulf of Mexico Energy Security Act of 2006 (GOMESA)

Q (2) How do state and federal moratoriums affect one another?

A There is no direct effect. State and federal governments maintain control over their respective jurisdictions and have the authority to modify or maintain moratoriums on oil and gas activities independent of one another. Because a major reason for the imposition of moratoriums off Florida is due to political pressure from the state, lifting the state moratorium would undoubtedly weaken political and legal support for the federal moratorium, while lifting or relaxing the federal moratorium would not necessarily have the same impact on the state moratorium.

The state currently prohibits the granting, selling or executing of oil or gas leases within the submerged lands over which Florida has jurisdiction (3.45 statute miles from the coastline on the East Coast and 10.36 statute miles on the Gulf Coast). State law also prohibits both the issuing of permits to drill exploratory wells and the issuing of permits for structures used for drilling or producing oil and gas.

Federal moratoriums are in flux due to the tension between Florida’s concerns for leasing off its shores, pressure for more offshore oil and gas production and military uses of the Gulf off the Florida coast. A Congressional ban on new leasing enacted in 2006 created a 125-mile buffer from Florida’s coastlines in the eastern zone of

the Gulf that encompasses all of peninsular Florida, and a 100-mile buffer in the central zone of the Gulf that encompasses a portion of Florida’s Panhandle region.

In addition, there are restrictions on oil and gas activities east of a north-south federal border known as the Military Mission Line that extends into the Gulf from the Panhandle near Destin. That ban is to protect the flight paths of military aircraft on training missions over the Gulf. In effect, the line extends the federal moratorium to about 230 statute miles west of Tampa Bay. Both federal moratoriums are in effect until 2022, unless Congress repeals them.

State and federal governments can lift their bans independently of one another, and the lifting of one ban does not necessarily mean the other will be lifted. However, it would be hard to maintain Congressional support for a ban on oil and gas activity from 10.36 to 125 miles from the Florida coastline when the state is allowing it inside of 10.36 miles. Lifting the state moratorium might weaken the state’s position when protesting oil and gas activities in submerged lands under federal jurisdiction, but if the federal moratoriums were removed or modified, there might not be any immediate political or legal implications for the state moratorium.

SOURCES: Submerged Lands Act 1953; Minerals Management Service 2009 GOMESA report; FDEP staff research; MMS staff research. IESES Symposium I

Q (3) What discretion does Florida have in setting lease terms and royalty rates for drilling in state waters?

A The state has considerable discretion. The federal Submerged Lands Act (SLA) recognizes a state's rights and power to lease the submerged lands it controls. Florida law grants the Governor and Cabinet, sitting as the Board of Trustees of the Internal Improvement Trust Fund, the power to control private uses of submerged lands that are owned by the state. The board is authorized to negotiate, sell, and convey leasehold estates in and to state-owned lands for the purpose of developing and producing oil and gas. This power is constrained, however, by the Florida constitutional requirement that such transfer be in the public interest. State law currently forbids oil and gas activities from occurring on state-owned submerged lands.

There are strategic considerations when states develop leasing policies, with an emphasis on maximizing state revenues, preventing waste, protecting the environment and maintaining transparency. Important revenue considerations include auction mechanisms, bonus payments, lease rental rates and royalty rates. After successfully bidding, a lease holder pays a bid bonus to the state or federal government (depending on which entity has jurisdiction over the submerged lands) and then rents the right to develop resources in that area. The government collects the bonus regardless of whether oil and natural gas resources are produced. Leaseholders also pay royalties to the state or federal government, based on the value of natural gas or oil produced. State and federal royalty rates range from 12.5 percent to 25 percent with most Gulf of Mexico states opting for the higher end of the range. Each oil-producing state along the Gulf sets its own lease terms and royalty rates.

Sources: Submerged Lands Act 1953; FDEP staff research; Louisiana Department of Natural Resources; Texas Railroad Commission; Texas General Land Office; Alabama State Oil and Gas Board; IESES Symposium I



Q (4) **Would Florida receive a share of outer continental shelf royalties if the federal moratorium were lifted?**

A Probably, but Congress would determine the amount and terms. Historically, the federal government has been reluctant to provide coastal states with a direct share of revenues derived from oil and gas activities on the Outer Continental Shelf (OCS). Recent legislation now allows for some revenue sharing in specific OCS areas, but federal drilling moratoriums in the Gulf of Mexico off Florida's coastline have largely excluded Florida from participating. If the federal moratoriums were lifted, Congress would determine what, if any, royalties Florida would receive.

Royalty payments from OCS oil and gas production have long been an important revenue source for the federal government. Such revenues exceeded \$20 billion in 2008. These revenues have been used in part to fund a number of state programs, and state governments have recently begun to receive direct shares of revenues from OCS activities. The Gulf of Mexico Energy Security Act of 2006, commonly referred to by its acronym, GOMESA, entitles four Gulf Coast oil-producing states to a 37.5 percent share of revenues collected by the federal government from oil and gas activities in specified OCS areas (only a very small area is eligible for revenue sharing through 2017). The money is split among Alabama, Louisiana, Mississippi and Texas and is apportioned by a formula based on the distance from a state's coastline to the middle of leasing areas in those federally submerged lands. In 2008, that 37.5 percent share totaled \$25 million. Alabama and Louisiana each received about \$8 million, Mississippi about \$7 million, Texas \$3 million. The amounts can fluctuate considerably from year to year because of prices and volume. The four states split just \$2.7 million in 2009.

In addition, all coastal states, including Florida, are entitled to 27 percent of the revenue from offshore leases on federally submerged lands up to 3.45 statute miles seaward of their state-controlled submerged lands. This is done to compensate states for any oil and gas resources siphoned by federal activities adjacent to their borders. This revenue stream is known as "8(g)," a reference to the section of the Outer Continental Shelf Lands Act that entitled coastal states to that share. Florida is eligible for a 27 percent share of activities in waters 10.36 to 13.81 statute miles off its Gulf coast shoreline. Because the state's coastline is under leasing moratoriums, it received less than \$100 in 2008. That money was for activities off the coastlines of Walton and Bay coun-

ties, where leases existed before the federal moratorium was put in place. By comparison, Alabama received \$15 million in 8(g) revenue in 2008. Louisiana received \$46 million; Mississippi \$564,000 and Texas \$13 million. If the federal moratoriums were lifted and oil and gas activity were to commence, Florida could collect 8(g) revenue, provided current law doesn't change.

States can also apply for grants from several federal preservation and conservation funds that are funded by OCS revenues. Florida received about \$2 million in historic preservation and land and water conservation grants each of the past several years.

SOURCES: MMS 2009 GOMESA report; MMS staff research; FDEP research; Outer Continental Shelf Lands Act; Energy Information Administration, Office of Oil and Gas 2005 report on offshore natural gas and oil activity. IESES Symposium I



STATE/FEDERAL REGULATORY INTERPLAY

Q (5) What, if any, legal restrictions exist for the use of royalty revenues derived from drilling in state and/or federal waters?

A States control the revenues generated within their submerged lands, but they are restricted in spending some of the Outer Continental Shelf revenues received from the federal government.

Gulf Coast states have used money derived from leases on state-owned submerged lands to pay for public education, to supplement general funds and to assist local governments. Texas dedicates its entire offshore revenues from state-owned submerged lands to public education for grades K-12. In Louisiana, money from offshore submerged lands goes into a general fund to be spent at the Legislature's discretion. In addition, local governments in Louisiana get a designated share of royalties from oil and gas production to spend as they wish. In Alabama, money from state royalties is placed in a trust fund and the investment income from that fund flows into the state's general fund. Subsequent to the fund's creation, several constitutional amendments have dedicated trust money to programs that protect environmentally sensitive lands and fund capital improvements for local governments.

States get money from federal leases in two ways. One of those revenue streams is tightly restricted; the other is not. By law, royalties states collect from the Gulf of Mexico Security Act (GOMESA) must be spent on coastal conservation, coastal restoration or hurricane protection. Florida, because of its leasing moratoriums, is excluded from GOMESA royalty revenue sharing. The other revenue stream, from so-called 8(g) royalties – those emanating from federally controlled leases in submerged lands 3.45 statute miles seaward from the border with state-controlled submerged lands – gives states considerable discretion in spending the funds. The moratoriums off Florida's coastline limited the state to less than \$100 in 8 (g) revenues in 2008.

SOURCES: Gulf of Mexico Energy Security Act of 2006; Submerged Lands Act 1953; FDEP staff research; Louisiana Department of Natural Resources; Texas Railroad Commission; Texas General Land Office; Alabama State Oil and Gas Board. IESES Symposium I



STATE/FEDERAL REGULATORY INTERPLAY

Q (6) What discretion does Florida have with respect to environmental protection (and associated permitting) for drilling activities in state waters?

A Like all states, Florida has considerable discretion. Along the state's Gulf Coast the Florida Department of Environmental Protection (FDEP) has regulatory authority over oil and gas activities from the shoreline to 10.36 statute miles seaward. Because of the state's moratorium, there are no regulations specific to offshore activities. They would be needed to address a range of issues, including environmental impact statements, contingency plans for significant spills and requirements for companies to post bonds.

In those areas in which states hold a measure of regulatory discretion, they must comply with federal environmental laws that protect marine life and regulate surface water and air quality. Some states join with the federal government in assessing environmental impacts and issuing permits for oil and gas activities over which the states have jurisdiction.

SOURCES: Florida Department of Environmental Protection; Louisiana Department of Natural Resources; Texas Railroad Commission; Texas General Land Office; Alabama State Oil and Gas Board.



Q (7) What, if any, discretion or input will local governments have in spending funds associated with oil and gas revenues, establishing environmental safeguards and/or zoning landside facilities?

A This would be determined by the Legislature. Florida currently has no offshore activities and therefore no processes in place for sharing royalties, or for consulting with local governments on environmental safeguards and zoning specific to oil and gas activities. Its onshore oil and gas revenue rules make no provisions for sharing royalties with local governments. However, there are default processes like the Florida Administration Procedures Act and the Growth Management Act that provide for state consultation with local governments regarding regulations and zoning.

Other states along the Gulf Coast share offshore royalties with local governments, although the spending discretion varies. Texas allocates its offshore revenues from state oil and gas activities to local school districts on an enrollment basis. Alabama has set aside a fund that local governments can tap for capital improvement projects. Louisiana dedicates a share of state-produced offshore royalties to local governments and allows considerable spending discretion. Local governments in states along the Gulf Coast generally retain zoning authority over facilities that service offshore oil and gas activities.

Like states, local governments can participate in decisions about federal oil and gas activities that affect their communities. According to the Submerged Lands Act of 1953, when the federal government considers leases on submerged lands under its jurisdiction "the rights and responsibilities of all states and, where appropriate, local governments, to preserve and protect their marine, human and coastal environments through such means as regulation of land, air, and water uses, of safety, and of related development and activity should be considered and recognized."

Currently there are no landside facilities in Florida dedicated to receiving and processing oil and gas reserves from offshore activities in the Gulf of Mexico. Oil and gas reserves from the Gulf are primarily shipped or piped to facilities in states that allow drilling off their shorelines.

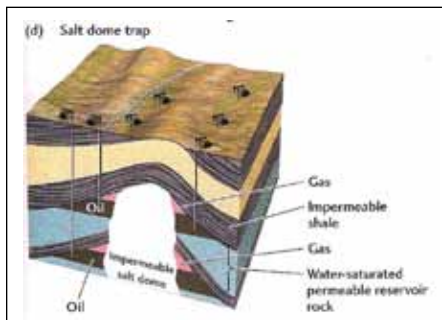
SOURCES: Florida Department of Environmental Protection; Gulf of Mexico Energy Security Act of 2006; Submerged Lands Act 1953; FDEP staff research; Louisiana Department of Natural Resources; Texas Railroad Commission; Texas General Land Office; Alabama State Oil and Gas Board.

Q (8) What do we know about the potential oil and gas resources in Florida's state submerged lands?

A Government assessments suggest that oil and gas reserves under Florida's state submerged lands (in state waters) are modest. Estimates exist for all of Florida's waters with the exception of areas west of Apalachicola. The total mean estimate for the majority of Florida's state submerged lands is 236 million barrels of oil equivalents (oil plus natural gas converted into an "equivalent" amount of oil), or less than 5 percent of the estimated amount in federal waters in the entire Eastern Gulf of Mexico. Forthcoming assessments that cover state submerged lands west of Apalachicola are expected in late 2010, and will allow for a complete estimate for oil and gas resources for all of Florida's state submerged lands.

The United States Geological Survey (USGS), within the U.S. Department of Interior, conducts oil and gas resource assessments on state lands and in state submerged waters. Florida's state submerged lands are included within two larger USGS assessment categories called provinces. Province 50 includes most of the peninsula and excludes the western portion of the Panhandle. Areas of Florida west of Apalachicola are included in Province 49, which extends into areas of Alabama, Mississippi, Louisiana and Arkansas. The mean estimate for oil and gas in Florida's Province 50 state submerged lands is approximately 110 million barrels of oil and 600 billion cubic feet of natural gas, which equals 236 million barrels of oil equivalents.

Assessments of a number of geologic formations have been conducted within Province 49 during the past decade. These assessments show minimal amounts of oil and gas in Florida's state submerged lands. However, Province 50 includes a geologic region known as the Norphlet formation. The Norphlet formation contains significant amounts of natural gas but an older USGS assessment from 1995 does not indicate how much of Norphlet's resources fall within Florida's waters. A forthcoming USGS assessment will provide specific Norphlet estimates for Florida and its state submerged lands.



A few additional observations warrant mention. Florida, its submerged lands and the West Florida Shelf that constitutes much of the southeastern Gulf of Mexico region are geologically distinct from areas in the Central and Western Gulf region that produce

large amounts of oil and gas. Most of Florida and the waters under its jurisdiction lie atop a limestone platform that, for the most part, lacks structural features such as salt domes that trap hydrocarbons. Salt domes are associated with the vast majority of commercially productive oil and gas fields in the Gulf of Mexico basin. Still,



Map of Lower Cretaceous Shoal-Reef Oil Assessment Unit and Sunniland total petroleum system. The area contained within the purple lines shows one of the two assessment units within Province 49.

USGS assessments suggest that smaller-sized undiscovered fields are likely to exist and may extend into state submerged lands in the Southwest Florida region. Florida's state submerged lands to the west of Apalachicola are associated with a separate geologic structure that may contain natural gas fields at significant depths in the subsurface.

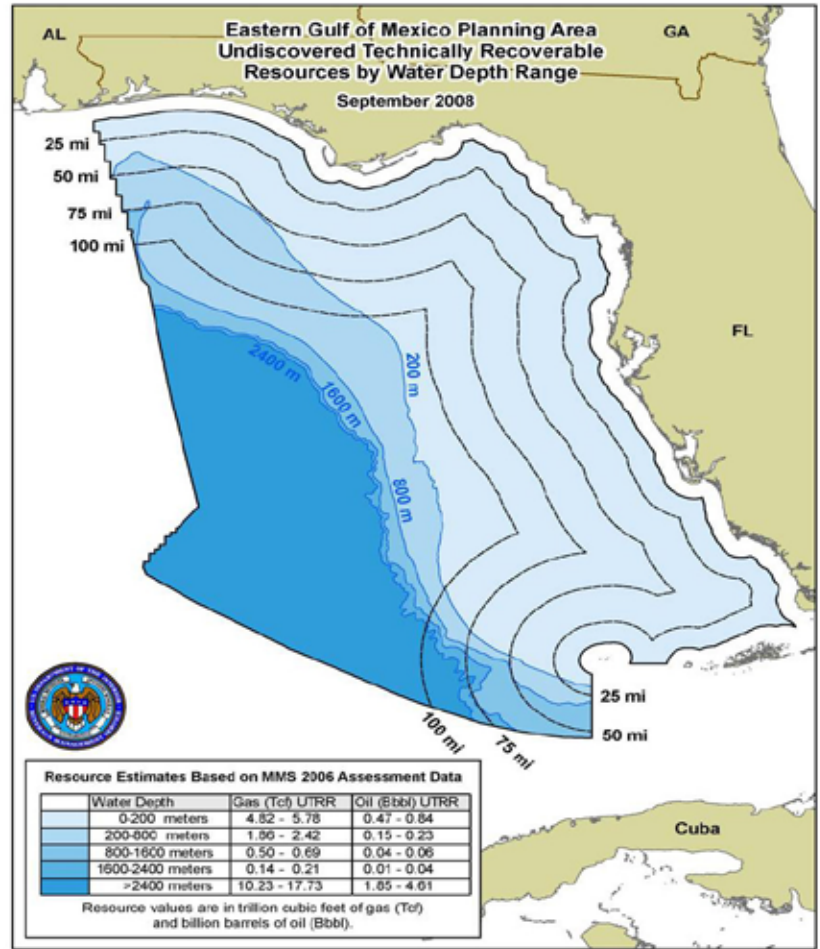
It should also be noted that much of the area subject to the current state moratorium was under lease for approximately 50 years. Exploration and drilling rights for approximately 3.6 million acres covering state submerged lands extending 3.45 to 10.36 statute miles offshore from Apalachicola to south of Naples were controlled by the Coastal Petroleum Oil Company from the mid-1940s through the mid-1990s. Coastal drilled 22 test wells through 1983. Only one in the Florida Keys produced a "significant show." None of these wells produced commercial quantities of oil, and after 1983 Coastal drilled no additional test wells despite the absence of restrictions on exploration through 1990. During this period no other companies asked to drill in state waters. Thus, for 50 years there was little, if any, evidence of industry behavior suggesting the presence of valuable oil and gas resources in Florida's coastal waters.

Conversely, it should also be noted that the perceived value of natural gas resources (apart from the value of oil resources) has increased since 1990. The resources are also more easily found due to advances in seismic technology – technology that has yet to be deployed across much of the Eastern Gulf of Mexico and Florida's state submerged lands. It is therefore reasonable to claim that commercially attractive hydrocarbon resource potential could exist in Florida's coastal waters despite historical behavior that suggests otherwise.

SOURCES: IESES Symposium II; MMS; Russ Dubiel, Rich Pollastro, Ron Charpentier at USGS; USGS website resources; Al Hine.

Q (9) What do we know about the potential oil and gas resources in the federal waters of the Eastern Gulf of Mexico?

A Government assessments suggest that estimates of oil and gas reserves in the Eastern Gulf of Mexico are moderate. Estimates for this region are much larger than those for Florida’s state waters, but much smaller than those for the Western and Central regions of the Gulf of Mexico. The mean estimate of 7.71 billion barrels of oil equivalents (oil plus natural gas converted into an “equivalent” amount of oil) includes 3.88 billion barrels of oil and 21.51 trillion cubic feet of natural gas. These amounts are likely to be more than 10 times that of Florida state waters, pending a new round of assessments for areas covering the Florida panhandle. However, as a comparison, this amounts to approximately one third of the estimated undiscovered reserves in the Western Gulf of Mexico and less than one seventh of the estimated undiscovered reserves in the Central Gulf of Mexico. Across the Gulf, drilling and production activities have steadily moved into deeper water, where assessments show greater resources. Of the roughly 7,300 active leases in the Gulf, 58 percent are in water 1,000 feet or deeper. That compares to 27 percent in those depths in 1992.



It is important to note that different agencies are responsible for conducting assessments of state and federal waters. The Minerals Management Service (MMS) conducts oil and gas resource assessments for federal waters known as the Outer Continental Shelf (OCS). The United States Geological Survey (USGS) conducts assessments for state waters. Their methodologies differ, and each has evolved over time.

As noted in the previous question, the West Florida Shelf, which constitutes much of the southeastern Gulf of Mexico region, is geologically distinct from areas in the Central and Western Gulf region that produce large amounts of oil and gas. That said, MMS assessments for the OCS do suggest that sizeable fields are likely in some areas under the federal moratorium in the Eastern Gulf of Mexico, with the bulk of the resource potential lying in an area known as the Destin Dome, 25 statute miles south of Pensacola, and in the deeper waters along the western edge of the Outer Continental Shelf.

Areas of the Eastern Gulf of Mexico under federal moratorium fall within what is known as the Eastern Gulf of Mexico planning area. The MMS 2006 estimates for Undiscovered Technically Recoverable Resources (resources outside known fields that are assumed to exist based on geologic knowledge and that are producible with current technology) in the Eastern Gulf planning area reveal a mean estimate of 3.88 billion barrels of oil and 21.51 trillion cubic feet of natural gas (or 7.71 billion barrels of oil equivalents). Given the lack

of exploration and limited well data from the Eastern Gulf, it is fair to note that estimates from this planning area are more uncertain than those from Western and Central regions of the Gulf of Mexico.

The 2006 MMS estimates for the Eastern Gulf of Mexico are also differentiated by water depth. With respect to the mean estimates of oil and gas, 16 percent of the estimated oil reserves and 24 percent of the natural gas reserves are believed to be at water depths of less than 200 meters (660 feet) while 77 percent of estimated oil reserves and 63 percent of natural gas reserves are believed to be in depths of more than 2,400 meters (7,900 feet). These numbers suggest that the bulk of oil and gas resources in the Eastern Gulf are believed to lie beyond the shelf break and far from the Florida coastline.

SOURCES: John Rodi, Deputy Regional Director, MMS Gulf of Mexico Region, Michael Prendergast, Chief of Staff, MMS Gulf of Mexico Region; MMS website resources.



Q (10) **What options exist for servicing oil and gas operations and delivering new sources of oil and gas in the Eastern Gulf to U.S. markets?**

A Florida lacks the capacity and infrastructure for servicing offshore oil and gas exploration. But if exploration efforts near Florida were successful, it is possible that some level of servicing capacity would develop along Florida's west coast. Oil produced in the Eastern Gulf of Mexico or within Florida's submerged lands would probably be transported by ship or pipeline to refineries in other Gulf states and then sold in the Southeast. However, it is possible that unrefined oil could be transported through Port Everglades, delivered to refineries in New Jersey, and sold in the central Atlantic or Northeast region of the United States. Currently, unrefined oil is extracted from onshore wells in the state's Big Cypress National Preserve and transported to Port Everglades for shipment to refineries outside Florida.

Natural gas would need to be processed in facilities in the central Gulf region before being delivered through pipelines to markets in the Southeast. Supply vessels might come out of existing ports in Alabama and Louisiana but eventually shift to Florida west coast ports such as Tampa or Port Manatee if exploration efforts prove successful.

Liquid hydrocarbons such as crude oil or gas condensate require various refining processes to yield fuels such as gasoline or diesel, petrochemicals or petroleum feedstock to the chemical industry.

The closest refineries are on the Gulf coast in Alabama, Mississippi, Louisiana and Texas. Liquid hydrocarbons would be transported to refining facilities through pipelines, although lightering operations to tankers might occur, depending upon location and depth of the production facility. No "Greenfield" refineries (meaning those in new areas that do not contain existing refinery operations) have been permitted or constructed in the U.S. for more than 20 years.

Supply and crew boats would make numerous trips to support exploration. The supply vessels carry fresh water, fuel, cement, barite, liquid drilling fluids, tubular steel drillstrings, wireline and well-logging services, equipment, food, miscellaneous supplies and sometimes personnel. Crew boats carry primarily personnel and sometimes supplies. Six to nine trips per week are required to support exploratory drilling at each offshore structure. Assuming an average of six weeks on site to drill an exploration well, this amounts to 36 to 54 service-vessel trips in support of each well. Helicopters are the primary mode of transporting personnel between shore bases and offshore drill rigs. Each helicopter typically makes three to 10 trips per week in support of exploratory drilling operations. Assuming six weeks on site to drill an exploratory well, 18 to 60 helicopter trips would be expected in support of each well.

SOURCES: "Deepwater Gulf of Mexico, Environmental and Socioeconomic Data Search and Literature Synthesis, Volume I" MMS 2000. IESES Symposium I.

Q (11) **What do we know about the potential government revenue and employment benefits for Floridians that could result from drilling in Florida state waters?**

A Precise estimates for economic benefits associated with oil and gas exploration and development in Florida's submerged lands need to be viewed with caution. However, reasonable estimates exist for revenue and employment projections associated with federal moratoriums in the Eastern Gulf of Mexico beyond the state's submerged lands. These estimates (and the methodologies used to produce them) can inform expectations for Florida's submerged lands.

Estimates of potential government revenues to be gained from drilling in Florida's state waters and/or the Eastern Gulf of Mexico can vary widely and are heavily contingent upon their underlying assumptions. Important factors include the total estimated amount of recoverable oil and gas resources, the proportion of that base that can be developed over a 20-year time frame, projected capital expenditures, the estimated value of the oil and gas produced (based on price projections and discount rates), the basis for government revenue projections (tax credits for capital expenditures, bonus payments, lease fees, royalty rates, etc.), the basis for employment impact projections, and multiplier effects.

In researching the question of economic impacts, one analysis was particularly instructive. *Strengthening Our Economy: The Untapped U.S. Oil and Gas Resources* is a December 2009 report prepared by ICF International on behalf of the American Petroleum Institute. While cognizant that this information source is an advocacy organization, we found the report helpful in translating resource estimates into government revenue and employment projections. The report summarizes an analysis of the potential impact on future U.S. oil and gas production from opening to exploration and development in the offshore moratorium areas in the Eastern Gulf of Mexico, the Atlantic, and Pacific, as well as ANWR in Alaska, and a portion of the currently unavailable federal lands in the Rockies. The analysis is developed around two resource baselines. The first baseline is referred to as the "middle resource case" and it uses the mean MMS or USGS estimates of undiscovered technically recoverable resources (resources outside known fields that are assumed to exist based on geologic knowledge and that are producible with current technology) in each OCS planning area or geologic province. A second baseline is referred to as an "alternative resource case." It is based upon historical MMS/USGS underestimates, or the difference between original estimates that date to the 1970s and current estimates. While the validity of the alternative resource case baseline can be debated, the methodology and models used to translate resource estimates into production profiles, government revenues and employment projects seem to be reasonable. Specifically, ICF uses a reasonable model to develop production profiles and government revenue estimates from each oil and gas resource baseline and a widely accepted economic impact model to develop a detailed breakdown of employment projections over a 20-year time frame.

Detailed estimates of economic impacts that could be derived from the offshore moratorium areas of the Eastern Gulf of Mexico are provided in the report (and summarized in the next question in this report). Although the ICF report does not consider Florida state waters, a comparable assessment can be conducted using USGS estimates for them. The three critical components of such an assessment would include:

1. A complete set of accurate USGS estimates of oil and gas resources in Florida waters;
2. A reasonable methodology/model for developing oil and gas production profiles based upon the total estimated resource base; and
3. A reasonable methodology/model for estimating government (revenues) and private sector (jobs) impacts that can be derived from the production profile.

Given the uncertainty associated with estimates for Florida's state submerged lands west of Apalachicola it may be best not to provide precise revenue estimates in advance of the forthcoming USGS assessment results (expected in late 2010).

Likewise, it would be prudent to refrain from identifying employment estimates because of uncertainties associated with the pending USGS assessments and the lack of access to the models used in the ICF study. Worth noting, however, are the estimated employment impacts associated with ICF projections for federal waters in the Eastern Gulf of Mexico. Given that estimated resources for Florida are a fraction of those contained in the Eastern Gulf it could be expected that Florida's employment impacts would be significantly less than those anticipated by ICF for the federal waters in the Eastern Gulf of Mexico.

Although revenue data from other Gulf states should be viewed with caution because of variations in their respective oil and gas resource profiles, it is worth including some here to provide perspective on the range of potential benefits.

Of the Gulf states, Alabama appears to generate the largest amount of government revenue from hydrocarbon production (Alabama produces exclusively natural gas) within state waters. Alabama has averaged roughly \$200 million per year in annual revenues over the past decade with a peak of \$355 million in 2006. Texas government revenues from offshore state lands were approximately \$75 million in 2008 and averaged \$52 million annually from 2006-2008. Louisiana government revenues from offshore state lands were approximately \$98 million in 2009.

SOURCES: *Strengthening Our Economy: The Untapped U.S. Oil and Gas Resources*, prepared by ICF International on behalf of the American Petroleum Institute; USGS; Louisiana Department of Natural Resources; Texas General Land Office; Alabama State Oil and Gas Board.

Q (12) **What do we know about the potential government revenue and employment benefits for Floridians that could result from drilling in federal waters in the Eastern Gulf of Mexico?**

A A recent study by ICF International specifies the potential total government revenues and employment benefits that could be expected from oil and gas development in the Eastern Gulf of Mexico (EGOM). When MMS mean estimates for the Eastern Gulf are used as a baseline, the study suggests that annual government revenues would amount to hundreds of millions of dollars over the next 20 years with a cumulative total of approximately \$8 billion during that period. If Florida were to receive between 10 and 25 percent of the 37.5 percent shared by Gulf Coast states this could amount to \$400 million to \$800 million over a 20-year period – or roughly \$20 million to \$40 million a year. But that would depend upon the details of the legislation lifting the federal moratorium and the production volumes that are ultimately realized. Total employment impacts that can be derived from the MMS mean estimates would amount to nearly 10,000 new jobs (both offshore and onshore) over the same period. Using the 10 to 25 percent assumption Florida could expect to secure between 1,000 and 2,500 of these jobs.

A timeline of the aforementioned revenues would look like this: Estimated government revenues from taxes, royalties, lease auctions and rents of submerged EGOM lands associated with the MMS mean resource case are initially negative (due to tax credits associated with capital expenditures) for a few years before turning positive in 2015 at \$35 million; annual estimates escalate to approximately \$426 million in 2020, \$685 million in 2025 and \$864 million in 2030, resulting in a cumulative 20-year estimate for federal government revenues for Florida from 2010 through 2030 of approximately \$8 billion.

While the mean estimate is highlighted in the previous paragraphs, there is another estimate that bears mention. ICF uses a second baseline referred to as an “alternative resource case,” which is based upon historical MMS/USGS underestimates, or the difference between original estimates from the 1970s and current estimates. When the ICF alternative case is used as a resource baseline the projected revenues increase substantially. Estimated annual government revenues are initially negative but escalate quickly to \$280 million in 2015 and \$1.7 billion in 2020. Revenues continue to climb to \$2.8 billion in 2025 and \$3.9 billion in 2030. The cumulative estimate for government revenues from 2010 through 2030 is approximately \$35 billion. If Florida were to receive between 10 and 25 percent of the 37.5 percent state share this could amount to \$1.75 billion to \$3.5 billion over a 20-year period – or roughly \$90 million to \$180 million a year.

If the federal moratorium were lifted or relaxed, Florida might be eligible for a portion of the 37.5 percent share of government revenue referred to in the previous paragraphs and generated under the Gulf of Mexico Security Act (GOMESA). Florida’s portion would be determined by new legislation, but existing legislation guarantees each Gulf state a minimum of 10 percent of the percentage share allocated to states. In 2008, Gulf state revenues from GOMESA ranged from roughly \$3 million for Texas to roughly \$8 million for Louisiana (these modest figures result from small areas of OCS waters eligible for royalty sharing under GOMESA). Gulf states also collect money from 8(g) leases – leases that occur in federally submerged lands within 3.45 statute miles of state waters. In 2008, Alabama received \$15 million in 8(g) funds; Louisiana, \$46 million; Mississippi \$564,000; and Texas \$13 million.

With respect to employment impacts, when the MMS mean resource estimates are used as a baseline, the ICF study estimates a timeline of roughly 2,100 new jobs created in 2010, 8,800 by 2020 and 9,500 by 2030. Between 1,000 and 2,500 might end up in Florida. When the alternative resource case is used, these figures are estimated to be 2,100, 16,800 and 21,700 respectively. Between 2,000 and 5,000 jobs might end up in Florida.

SOURCES: *Strengthening Our Economy: The Untapped U.S. Oil and Gas Resources*, prepared by ICF International on behalf of the American Petroleum Institute; MMS; Louisiana Department of Natural Resources; Texas General Land Office; Alabama State Oil and Gas Board; IESES Symposium I



Q (13) **What impact will drilling in Florida state (and/or federal) waters have on energy prices?**

A Lifting the moratoriums in both federal and state waters would have no discernible impact on petroleum prices at the retail level. Robust development of all natural gas resources in federal waters in the Eastern Gulf of Mexico could, with accompanying infrastructure development, have a modest impact on regional electricity prices over the medium to long term.



There are two pathways through which oil and gas production could affect retail prices. The first would be to impact wholesale market prices through substantially increased supplies. The second would be to impact retail markets through improvements in delivery infrastructure. Such improvements could remove bottlenecks, improve reliability, and reduce the risk of supply disruptions – all of which can impact short-term retail prices.

An important distinction to make between oil and natural gas markets is that prices for oil are largely determined through world markets while prices for natural gas are largely determined through regional markets. Even the most optimistic amounts of potential oil production from Florida state submerged lands and/or the Eastern Gulf of Mexico would be inconsequential for world market prices, which are dictated by more than 80 million barrels of oil consumed per day.

As noted above, robust development of natural gas infrastructure and accompanying delivery infrastructure could have modest impacts on electricity prices. Any attempt to specify precise impacts would be highly speculative.

Q (14) **Would the development of oil and gas resources in Florida waters (and/or areas in the Eastern Gulf of Mexico under federal moratorium) make us less dependent on foreign energy suppliers?**

A Aside from acknowledging the adage that every little bit helps, the development of oil and gas resources in both Florida's state submerged lands and the federal waters in the Eastern Gulf of Mexico would have no discernible impact on the state's or the country's dependence on foreign oil.

As noted in the resource assessment discussion, the most optimistic amounts of potential oil production from Florida's state submerged lands would have a negligible impact on the country or the state's oil imports. Estimated oil reserves for the majority of Florida's state waters are approximately 110 million barrels. Production derived from these reserves would boost U.S. supplies by a small fraction of 1 percent. To put that in context, the total estimated amount of oil reserves in Florida would satisfy the U.S. demand for oil (approximately 20 million barrels a day) for less than a week.

Estimated oil reserves in federal waters in the Eastern Gulf of Mexico are more substantial, about 4 billion barrels. Still, the production volumes to be derived from these reserves pale in comparison to those in the Central and Western regions of the Gulf of Mexico and would not boost U.S. production by more than 1 or 2 percent. To the extent that this amount displaced imports it could translate into less U.S. money being sent to foreign governments. Again, however, with respect to the volumes of oil and gas under consideration this wouldn't have a discernible impact on the pattern of trade.

With respect to natural gas resources, robust development would largely displace coal as a preferred fuel source for electricity generation. Given that the country's demand for coal is supplied domestically, the expansion of natural gas production capacity would have little if any impact on foreign fuel imports. The bulk of U.S. natural gas imports originate from Canada and serve regional markets in the North.

SOURCES: Energy Information Administration, Minerals Management Service.

Q (15) **Could restrictions be placed on exporting any of the oil and gas produced in Florida state waters (and/or areas in the Eastern Gulf of Mexico under the federal moratorium)?**

A Yes. Under the Commerce Clause of the Constitution, the federal government has supremacy over interstate and international trade, and the exporting of oil is controlled through several federal statutes, including the Export Administration Act. The Commerce Department administers these export control provisions. There are only limited circumstances where the department will approve export of crude oil, usually when it is of extremely poor quality, or crude oil exports are authorized in exchange for refined petroleum.

SOURCES: Donna R. Christie, Associate Dean for International Programs, Florida State University College of Law.



Q (16) **What do we know about oil in marine waters? What is the experience with oil spills/accidents in the US and worldwide? What were the causes and consequences in the most salient cases?**

A The majority of oil in marine waters comes from naturally occurring seepage from the seabed and this is especially true in North American waters. Accidental oil spills are low-probability events but they have the potential to significantly impact coastal ecosystems and economies. No oil spill is entirely benign. Even small spills, depending on timing and location, can harm marine life, ecosystems, and coastal economies. The high-profile Exxon Valdez spill focused attention on oil tankers, but serious accidents involving vessels are rare. For the most part, spills associated with hurricanes Katrina and Rita involved releases from damaged pipelines and onshore storage and refining facilities. Although offshore rigs and platforms were damaged by Katrina, the amount of oil spilled from these rigs and platforms was minimal. A widely publicized August 2009 accident in the East Timor Sea involved a blowout on a jack-up drilling rig; similar incidents are less likely in the U.S. because safeguards are stronger here.

Natural seeps account for roughly 45 percent of the total annual oil load to the world's oceans and 60 percent of the total load to North American waters. After natural seepage, spills associated with the consumption of petroleum (urban runoff, polluted rivers and discharges from commercial and recreational vessels) account for the second highest proportion of oil in marine waters. Oil spills associat-

ed with transportation are the third highest proportion. These types of spills have significantly declined over the past 20 years, in large part due to passage of the Oil Pollution Act of 1990 in response to the 1989 Exxon Valdez spill. This law expanded and clarified the authority of the federal government and created new spill and preparedness requirements. It also strengthened liability provisions and provided a greater deterrent against spills. Accidents associated with drilling operation extraction introduce the least amount of oil to marine waters. The volume of oil spilled in U.S. waters is a small fraction of one percent of the amount produced in those waters.

Oil spills can cause impacts from only a few days to multiple years or even decades. Florida's coastline is especially sensitive to spills because of its mangrove forests, seagrass beds and coral reefs. Complex processes of oil transformation in the marine environment start developing from the first seconds of oil's contact with seawater. The progression, duration, and result of these transformations depend on the properties and composition of the oil, the size of the oil spill and a range of environmental conditions such as temperature, wind and currents.

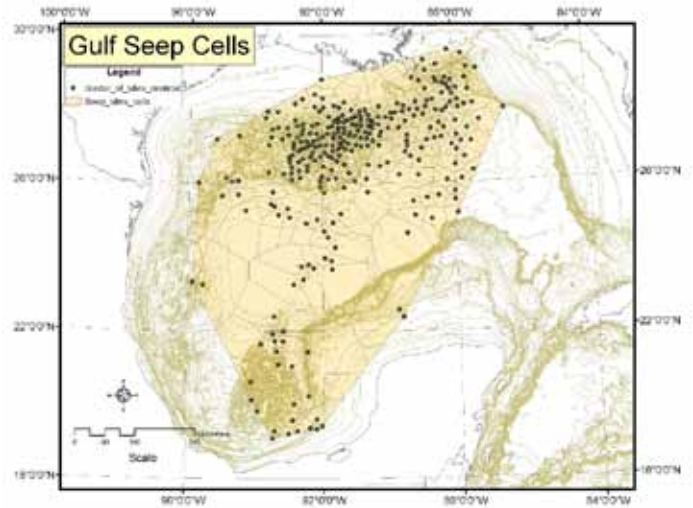
Oil released into marine waters more than 100 miles off the West Florida shore would probably become entrained in the Loop Current, which feeds back into the Gulf Stream. Depending upon the ability of emergency responders to contain the spill and/or the rate of oil degradation, such spills could pose some risk to coastal communities in the Florida Keys and on the east coast of Florida. Accidental releases on the West Florida shelf closer to land would be subject to prevailing winds and water currents. These can vary considerably. Holding all other factors constant, the closer an accidental spill occurs to the coastline the greater the risk it poses to coastal communities.

ENVIRONMENTAL RISKS, PERMITTING AND EMERGENCY RESPONSE

Although leasing moratoriums are in effect off Florida's coastline, millions of tons of refined petroleum products are shipped into Florida ports every year for delivery to airports and gas stations, among other destinations. Accidents involving those deliveries have been rare, with a 1993 accident involving three barges that spilled 330,000 gallons of oil and jet fuel being the most prominent for Florida. Lifting the moratoriums would not necessarily increase vessel traffic into Florida ports because crude oil produced in the Eastern Gulf and in state waters would likely be shipped to Gulf Coast states with existing refinery operations, rather than to Florida, which has no refineries. Still, the lifting of the federal or state moratoriums would increase vessel traffic in the federally controlled waters of the Eastern Gulf in relation to the resources discovered.

Many Floridians have expressed concerns about the risks posed by hurricanes. Damage assessments associated with hurricanes Katrina and Rita suggest that oil and gas infrastructure is indeed vulnerable to extreme weather events despite robust safety protocols implemented to minimize spills. Most of the oil spilled in conjunction with Katrina and Rita came from damaged landside facilities. Offshore spills (most of which are thought to have come from ruptured underwater pipelines) were estimated at 17,600 barrels of the total 214,000 barrels estimated to have spilled during the storms.

Tar balls and dark sand are another salient concern of Gulf Coast residents. The darker sand found on Texas beaches is more a function of geology than environmental pollution. Unless observed in the wake of an accidental spill, most tar balls can be attributed to natural seeps. Prior to 1990, many tar balls could also be associated with ballast water from shipping traffic, especially on the East Coast of Florida. Stricter laws are now in place to prevent vessels from discharging ballast in range of coastlines.



The above map was provided courtesy of Ian MacDonald. The map shows that the majority of natural seeps occur in the Central and Western Gulf. Prevailing water currents keep the oil released through these seeps away from the Florida coastline.

Economic impacts associated with oil spills are difficult to estimate. Each spill is distinct and impact assessments for any given spill can vary widely. Cleanup costs and economic losses for the most severe spills can total in the billions of dollars. The assumptions underlying any given impact assessment are important to highlight, and the public should exercise caution when reviewing impact estimates reported in the media. Extrapolations that extend beyond the specific geographic region where data are collected can become highly problematic because of displaced economic activity as opposed to lost economic activity.

SOURCES: MMS; Ian MacDonald



ENVIRONMENTAL RISKS, PERMITTING AND EMERGENCY RESPONSE

Q (17) What do we know about the potential impacts of drilling on sea-floor habitat?

A Scientific studies conducted to date do not reveal substantial, lasting impacts from drilling activity on benthic habitat – where organisms live on or in the sea bottom. Concerns about benthic habitat, where valid, rely more on unanswered questions about specific habitats on the West Florida shelf than on scientific findings that demonstrate significant risks. Environmental impact statements required for leases in federal waters should address many of the questions raised by stakeholder groups, although criticisms have been directed at the rigor of past assessments conducted by the Minerals Management Service (MMS). The process by which they would be addressed in state waters is less clear.

Naturally, drilling into the seabed for oil and gas affects the sea bottom. As the drill bit grinds rock it produces “cuttings.” In addition, a muddy liquid is used to lubricate the drill and extract the cuttings. The cuttings and mud can blanket an area around the borehole, affecting organisms living in the sediment.

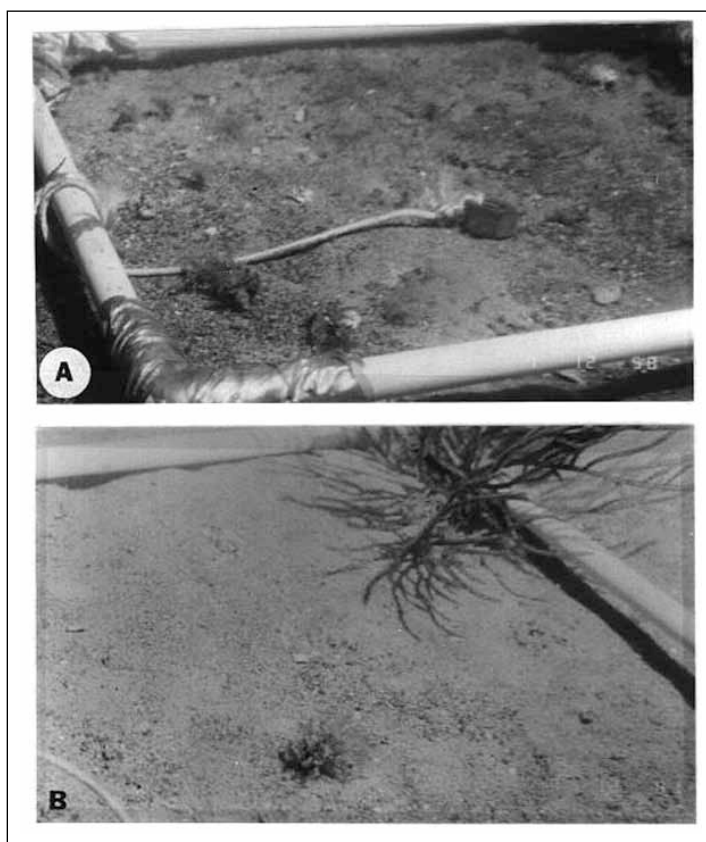
Considerable work on environmental impacts has been conducted by the MMS through its environmental program and in conjunction with multiple environmental impact statements for general leasing programs and specific leases. Summary reports depict the benthic impacts associated with drilling activities in the Gulf of Mexico as modest and temporary.

One 1993 MMS study was conducted of abandoned exploratory drilling wells in the Eastern Gulf of Mexico. During the study researchers used submersibles to observe the areas around six sites off northwest Florida and Alabama where drilling had occurred between 1972 and 1990. The debris was chronicled and photographed and seabed samples were taken for analysis. The impacts varied, depending on the ocean depth and the length of time since drilling had ceased. The site with the longest period of inactivity (17 years) was the nearest to pristine. At two sites where activities had ceased five years earlier, large concentrations of cuttings and heavy metals associated with mud were evident. Impact zones ranged from one to three acres. Using soil samples the researchers measured barium, zinc, iron and chromium. After reviewing the findings at all six sites, the researchers concluded that the cuttings are dispersed over time by currents and the movement of marine life, and that the levels of heavy metals that might affect habitat had diminished to acceptable levels over prolonged periods. However, levels higher than what is considered acceptable might persist at some sites for decades. The study did not attempt to define the potential effects of elevated levels of heavy metals on the habitat before dispersal. Concerns remain about the effects of drilling on the habitat, including the chance it will elevate mercury levels in the sand under drilling rigs and the possibility that cuttings and mud can negatively affect the food chain by reducing marine creature populations around the rigs.

Additional concerns have been expressed about the potential impacts of drilling on freshwater springs associated with karst (limestone) structures, patch reefs and other sensitive bottom features. No scientific studies were identified that addressed these concerns but we assume they would be considered in environmental impact statements associated with permitting processes.

The MMS requires that discharge permits be obtained from the EPA before companies are allowed to drill. In some cases the MMS requires companies to conduct seabed surveys for sensitive areas, or force them to move away from these areas. It can also force them to shunt discharges to the seabed to reduce the time metals are suspended in the water. The MMS inspects offshore facilities to ensure that discharges are properly managed. As noted above, it is less clear how the Florida Department of Environmental Protection would address similar concerns associated with permitting in state waters.

SOURCES: 1993 report “Habitat Impacts of Offshore Drilling: Eastern Gulf of Mexico,” by Eugene A. Shinn, Barbara H. Lidz, Christopher D. Reich, prepared under contract for the Minerals Management Service; Minerals Management Service information on drilling waste; Environmental Protection Agency 2000 report on oil and gas extraction.



These photos taken as part of the 1993 MMS study show the seabed surrounding an abandoned 1985 drilling operation 42 statute miles east of Apalachicola. The top photo shows a thin layer of cuttings over exposed limestone. The bottom photo shows another area with a thicker sediment containing cuttings and a live gorgonian coral (top right).

Q (18) **What do we know about the impacts of drilling fluids and other forms of waste from drilling operations?**

A Offshore oil and gas activities can result in heavy metals and debris disturbing several acres around the wells. Discharged wastes can blanket the seabed around a borehole, and the turbidity caused during drilling can adversely affect sea life adjacent to the activity. That said, Minerals Management Service (MMS) studies show that impacts are mitigated by the currents and shifting sands after drilling ceases and healthy ecosystems can exist at abandoned sites.

Offshore oil and gas activities produce a number of waste materials. Salty water brought up with the oil is known as “produced water” and often contains oil and metals. Liquid muds are pumped down the hole to lubricate the drill bit and help bring the debris to the surface. The muds typically contain the metal barium as a weighting agent and are considered toxic. In addition, the materials used to make the mud are taken from onshore sites and can contain minerals and impurities not commonly found on the ocean floor. While generally water-based, the muds can be oil- or synthetic-based, depending on the well depth and the type of drilling activity, such as that used on horizontal wells. The drilling also produces tons of what are called “cuttings,” the ground pieces of rock and other material the drill bit cuts. Life on the rigs produces its share of wastes, too, such as treated sanitary water, trash and debris. Bilge water, ballast water, waste oil, contaminated drainage from the rig decks and excess cement are also produced during offshore operations.

The muds and rock cuttings represent a significant portion of drilling wastes. The Environmental Protection Agency estimated in 1993 that for each exploratory well in the Gulf of Mexico, companies discharged nearly 336,000 gallons of drilling fluids and nearly 113,000 gallons of cuttings into the water around the rigs. For development wells, the estimates were nearly 252,000 gallons of drilling fluids and 67,000 gallons of cuttings. However, the MMS reports that “studies on the potential impacts to the environment from the discharge of drilling muds have found that the effects are short-lived and confined to a localized area around the platform. Studies to determine subtle, long-term effects caused by drilling muds have been inconclusive; effects of muds cannot be distinguished from other changes in the environment.”

The EPA, which regulates offshore wastes, allows the discharge of cuttings and water-based drilling muds after toxicity testing. It also allows the discharge of treated sanitary and domestic wastes, and treated “produced water.” Bilge and ballast waters may also be discharged, along with excess cement. Prohibited discharges include oil-based and synthetic-based muds, chemical products, trash and debris. Wastes that are not allowed to be discharged are shipped onshore for disposal or recycling. Some states turn to the EPA to regulate discharges in state-owned submerged lands. In Florida, the Department of Environmental Protection is authorized by the EPA to issue permits for discharges under the National Pollutant Discharge

Elimination System. That authority could be applied to offshore activities if the moratorium were lifted. Activities in state-owned submerged lands must follow federal Clean Water Act regulations, among other federal laws protecting marine life.

SOURCES: Environmental Protection Agency; 1993 report “Habitat Impacts of Offshore Drilling: Eastern Gulf of Mexico,” by Eugene A. Shinn, Barbara H. Lidz, Christopher D. Reich, prepared under contract for the Minerals Management Service; Minerals Management Service information on drilling waste. Environmental Protection Agency 2000 report on oil and gas extraction.





Q (19) What do we know about the impact of oil and gas infrastructure on air pollution?

A Air emissions from offshore oil and gas activities contribute to hydrocarbons being released into the atmosphere. Offshore operations use heavy machinery to run the drills and keep the rigs operational. Generators, air compressors, deck cranes, thrusting machines and a variety of other equipment can be running at any given time. They emit air pollutants like nitrogen oxides, sulfur oxides, carbon dioxide and particulate matter considered hazardous. Minerals Management Service (MMS) planning documents suggest that offshore drilling rigs operating on the Outer Continental Shelf (OCS) do not pose a significant risk to onshore air quality. However, the EPA has noted that compliance with the Clean Air Act cannot be assumed and that permits must be considered on a case-by-case basis.

According to the MMS, no substantive degradation of onshore air quality is expected to take place in conjunction with a draft five-year lease plan (2010-2015) that includes federal waters in the Eastern Gulf of Mexico planning area. Emissions associated with routine offshore activities could cause small increases in onshore concentrations of some air pollutants but will not exceed national or state air quality standards, the MMS reports. Within state submerged lands, additional environmental impact studies would need to be conducted to make a similar determination. All oil and gas infrastructure facilities, regardless of location in state or federal submerged lands, must comply with federal Clean Air Act provisions. Importantly, the Clean Air Act Amendments of 1990 transferred control of offshore air quality from the MMS to the EPA and the EPA has noted that compliance with the Clean Air Act should not be assumed.

The EPA delegates regulatory authority to local air agencies when prospective drilling operations occur on state submerged lands (within state waters). In these cases states must develop a State Implementation Plan (SIP) to identify sources of air pollution and to determine what reductions are required to meet federal air quality standards.

SOURCES: Environmental Protection Agency; MMS

Q (20) What do we know about the potential impacts of seismic exploration on marine mammals?

A Seismic guns and other acoustic disturbances associated with oil and gas exploration and development can have significant impacts on marine life. Each species of marine mammal and each marine fishery varies in its sensitivity to sound frequencies.



Acoustic disturbances that affect one species may not affect another. Impacts are possible over large spatial areas. Incidents of direct injury or mortality are possible but much less likely than more subtle behavioral effects associated with masking communications between animals. Protocols exist that attempt to limit these impacts.

Data presented at IESES suggested that whales and fish (especially grouper) may be more susceptible to the acoustic disturbances associated with oil and gas activities than small cetaceans like dolphins and manatees. Mitigating measures are practiced in most parts of the world, including the Gulf of Mexico. The MMS requires certain measures, such as lookouts posted on vessels to warn operators to cease testing when mammals are spotted. Companies can also be required to begin the testing with low-volume air blasts that cause marine life to scatter before the blasts build to maximum volumes.

SOURCES: IESES; MMS; Symposium II

Q (21) What are the potential impacts to Florida from drilling in Cuban waters?

A Drilling activity in Cuban waters could pose a greater risk to Florida's coastline than drilling activity in federally submerged lands in the Eastern Gulf of Mexico. Studies show the sea currents flowing off Cuba's northwest coast could deposit oil from a significant spill anywhere from the Keys to Palm Beach. Cuba has created 59 leasing blocks in the Gulf, some about 20 miles north of Havana, in an area where the Loop Current, Florida Current and Gulf Stream systems generally flow. Those currents would more than likely carry oil northeast toward Florida, much in the same way they carry Cuban rafters.

The U.S. Geological Survey estimates there are 4.6 billion barrels of undiscovered oil, and 9.8 trillion cubic feet of undiscovered natural gas, off the northwest coast of Cuba in an area known as the North Cuba Basin. Press reports indicate Cuba has entered into contracts for oil and gas exploration with foreign interests that include a consortium led by a Spanish firm working with India's state-run oil company and Norway's state-run company. Seismic work is underway and exploratory drilling activity could begin by mid-2010. Cuba promises to follow international environmental standards, but that hasn't ameliorated concerns in Florida. Studies show that a spill off Cuba's coastline would be transported to points north. Depending on the wind direction (the winds are predominantly southeasterly) it is likely that oil would end up on Florida beaches anywhere from the Keys to Palm Beach and points farther north. With the Florida Current moving as swiftly as 4 knots it does not take long for the oil to move long distances. It is estimated that oil could go from the Cuban drilling sites to Cape Hatteras in a couple of weeks.



Cuba's national oil company will not be the operator for the drilling activities. Instead, established international oil companies currently active in the Gulf of Mexico, such as Spain's Repsol, Norway's Statoil-Hydro and Brazil's Petrobras, will be working off Cuba's shores. Cuba's leasing activities might be followed this year by oil and gas exploration activities in the Bahamas, which are southeast of Miami and just north of Cuba. It appears there is a geological plume off Cuba's coastline that extends into the Bahamas. It is expected that seismic work to explore for undiscovered reserves will begin in Bahamian waters in late 2010.

The Cuban embargo prohibits U.S. companies from doing business with the Cuban government, so spill response teams based in oil-producing states would be barred from responding to an accident in Cuban-owned submerged lands.

SOURCES: University of South Florida College of Marine Science; Jorge Piñon, energy fellow, University of Miami Center for Hemispheric Policy; U.S. Geological Survey.

Q (22) **What happens during the drilling process? What happens to the rig when the excavation is done?**

A The life cycle of a successful well can be broken into three stages: exploration, production and decommissioning. Offshore drilling in the state's submerged lands will typically use some type of drilling unit, typically a jack-up rig, anchored into the subsurface or bottom. These rigs provide a working surface to support drilling and production equipment. A drilling rig, similar to a land-based rig, is used to drill and complete the well, and usually a number of wells are drilled from any one platform.

Exploration

An exploration well generally refers to the first well drilled on a prospect to determine if an economically viable resource exists. Mobile offshore drilling units are typically used to drill exploratory wells. After a hydrocarbon discovery, one or more delineation wells may be drilled to confirm the commercial significance of the discovery.

Production

Once the well is completed and a discovery is judged commercially viable, a production facility is installed. Typical fixed platforms can operate in waters up to 1,000 feet deep, although near-shore jackup rigs operate in depths up to about 150-200 feet. The function of these platforms is to provide a workspace that can be used to support development drilling of production wells and production equipment. A drilling rig on the platform is used to drill and complete the production wells. The well system and drilling operations used for offshore production are functionally similar to those used onshore. The production equipment separates the produced oil, gas, and water, and the oil and gas are transported to shore through separate pipelines laid on the seafloor. Onboard pumps and compressors provide the necessary energy to transport the oil and gas to shore. The produced water is passed through an oil-water separator and discharged into the ocean. These bottom-founded platforms are fixed to the seafloor by a foundation consisting of pilings driven deep into the ocean floor. The decks upon which the equipment is placed are located at an elevation high enough above sea level to avoid being inundated by severe waves. The platform and its pile foundation are designed to be strong enough to resist the lateral forces and overturning moments caused by severe hurricane waves, currents, and winds.

Decommissioning

To satisfy the regulatory requirements and lease agreements for the eventual removal of these structures, decommissioning operations employ a wide range of activities that oversee any topsides removal (decking and structure above the waterline), seafloor severing, component lifting and loading, site-clearance verification work and final transportation of the structure back to shore for salvage or to another OCS site for reuse or reefing.

Complete or partial removal of steel or concrete fixed platforms that weigh thousands of tons is practically impossible without using explosive materials. Bulk explosive charges have been used in 90 percent of cases. This has a very powerful, although short-term, impact on the marine environment and biota, which should not be neglected.

MMS regulations provide measures to ensure that after decommissioning nothing will be exposed on the seafloor that could interfere with navigation, commercial fisheries, or future oil and gas operations in the area. During exploration, development, and production operations involved with mineral extraction in the Gulf of Mexico, the seafloor around activity areas becomes the repository of temporary and permanent equipment and structures.

Rigs to Reefs

Recently, the use of offshore structures for artificial reefs ("rigs to reefs or RTR") has gained popularity in the Gulf due to the cost and the difficulty of bringing structures onshore. Recycling retired natural gas and oil structures (platforms) as artificial reefs has



proven to be an effective tool for fishery management. Fishermen, divers, fishing support industries, coastal communities, the petroleum industry and others have benefited when retired, obsolete production platforms, already popular with offshore fishermen, are reevaluated and converted for continued use as fishery enhancement resources in the marine environment. To date approximately 195 petroleum structures have been donated and converted to permanent reefs (i.e. RTR) in the western and central Gulf.

The federal Minerals Management Service has been actively promoting the RTR program, encouraging oil-producing states to enact legislation so that companies can participate. The coastal states of Louisiana, Texas, Mississippi, Alabama and Florida have already adopted RTR rules and many obsolete rigs have been converted into artificial reefs. Some of the decommissioned rigs off Louisiana have been converted to fish and oyster farming operations and dive tourism destinations, bringing economic benefits to the area. Companies have done so by either towing the platforms to a location recommended by local governments, toppling them at the location of the drilling and production platform or removing the top of the structure and leaving the submerged part in place.

SOURCES: Structure-Removal Operations on the Gulf of Mexico Outer Continental Shelf Programmatic Environmental Assessment, "MMS; DECOM WORLD pub." "Offshore oil rigs: Can decommissioning ever be green?" by Sam Phipps; Rigs-to-Reefs Policy, Progress, and Perspective OCS Report, MMS; Stanislav Patin, Decommissioning, abandonment and removal of obsolete offshore installations; Mississippi Department of Marine Resources.

Q (23) **What types of environmental permits are required for oil and gas exploration and production activity in federal waters?**

A All oil and gas activities proposed for federally controlled submerged lands must pass through a series of environmental reviews conducted by a number of agencies, including the Department of the Interior, the Environmental Protection Agency, the National Oceanic and Atmospheric Administration and the U.S. Fish and Wildlife Service. Since the 1960s, several pieces of legislation have been enacted to protect the environment. The National Environmental Policy Act (NEPA), passed by Congress in 1969, requires the federal government to consider the environmental impacts of any proposed actions as well as reasonable alternatives to those actions. In addition, the Clean Air Act, passed in 1970, requires that companies prepare detailed emissions data for all proposed and existing oil and gas facilities, and the Clean Water Act, passed in 1977, requires that a permit be obtained before any pollutant discharge into federal waters. The Coastal Zone Management Act, passed in 1972, protects coastal zones by providing affected states an avenue to review and protest federal actions off their shorelines. The Endangered Species Act, passed in 1973, restricts actions likely to harm or harass endangered species. In 1990, the Oil Pollution Act (OPA) created oil spill prevention and preparedness requirements.

The Minerals Management Service (MMS) of the Department of the Interior maintains oversight of all oil and gas activities on the federally submerged lands known as the Outer Continental Shelf. In accordance with federal law, the Secretary of the Interior is required to develop programs which specify, as precisely as possible, the size, timing and location of areas to be evaluated for natural gas and oil leasing for the five-year period following the approval of each program. A lengthy, multi-step process of consultation and review is required before the Secretary can approve a new five-year program. Federal law requires that the environmental impacts of oil and gas activities be considered before leases are awarded. Therefore, as part of that five-year program the development of an environmental impact statement (EIS) is required and includes a description of the estimated oil and gas resources, a description of the existing environment and an analysis of the possible environmental effects of the proposed activity.

Before an individual lease sale can be held in a specific offshore planning area, a draft and a final EIS focused on the particular area being considered must be published for the public to view and comment upon. Special stipulations can be attached to a lease, based on environmental concerns raised during reviews. In general, an EIS is published before each lease sale. However, since lease sales are held on a yearly basis in the Central and Western Gulf of Mexico regions,

the MMS develops one EIS, and then produces environmental assessments for each following sale. These focus on new information developed since the EIS was published. Louisiana is protesting this, arguing that environmental impact statements are needed off its shore.

Before any exploration or drilling can occur, a company must submit an exploration plan and, subsequently, a development plan addressing environmental concerns specific to that lease. The MMS must withhold approval if the plans are inconsistent with the affected state's coastal zone management plan. MMS issues permits to operators at various stages of the exploration and production cycle. Once a site has been leased (and before exploration can begin) an operator must submit an exploration plan to indicate where and how drilling will take place as well as the environmental details. Information in this plan includes compliance with air and water permitting.

An application for a permit to drill is then required for each well, and a modification permit must be submitted if changes to the original drilling plan are intended. At the completion of exploration, an abandonment plan must be submitted for approval. Before site production begins, a development and production plan is submitted. It includes environmental details of the operation. An application to drill is required for each well proposed in the development and production plan. When production is complete, a decommissioning proposal for removal is required.

In addition, companies are required to submit Oil Response Plans to the MMS that ensure they are capable of responding adequately to spills. The plans must include details of the equipment and personnel available to respond. After production on a lease ceases, the company is required to plug all wells and dismantle platforms, although in some cases rigs have been repositioned for Rigs to Reefs programs and for other uses such as sites for offshore aquaculture projects.

SOURCES: Energy Information Administration, Office of Oil and Gas, overview of offshore natural gas and oil activities; MMS report on oil and gas leasing on the OCS; National Environmental Policy Act; Congressional Research report for Congress on oil spills background, governance and issues; Donna Christie, Associate Dean for International Programs, Florida State University College of Law.

Q (24) What types of environmental permits would be required for exploration and production activity in Florida waters?

A This would be determined by the Florida legislature and Florida Department of Environmental Protection (FDEP). Several permits required by FDEP for onshore activities could be applied to offshore activities. They include a geophysical permit, a drilling permit and an operating permit. The FDEP adapted its onshore permitting processes when Coastal Petroleum applied for offshore permits in the 1990s. Still, the state would need to create permitting processes specific to offshore activities if the moratorium were lifted.



Of the permits currently in state law:

- The geophysical permit is required for certain types of exploration activities. One is seismic activity, which is commonly associated with oil and gas exploration on submerged lands.
- The drilling permit covers a broad range of activities. As currently written, it requires an environmental impact analysis when the state determines a need; contingency plans for accidents and hurricanes; and bonding provisions to ensure companies can pay for cleanup costs in the event of accidents. The permit requires companies to select a location that avoids environmentally sensitive areas and minimizes environmental impacts. The permit also covers the plugging and abandonment of a well and site cleanup when the well is no longer active.
- The operating permit covers the production well facilities and procedures; the facilities, equipment and procedures for transporting the oil and gas; and the bonding and contingency planning. In addition, a state Environmental Resource Permit (ERP) is required, as well as a federal dredge and fill permit, an air resources permit, an air quality permit and a federal National Pollutant Discharge Elimination System permit. The ERP program regulates alterations to the landscape, including tidal wetlands.

Offshore activities would need approvals from the federal Minerals Management Service (MMS) for any spill planning, and from the U.S. Coast Guard for transportation and contingency plans. The state would have to coordinate offshore activities with the Department of Defense to avoid conflicts with military drills in the Gulf of Mexico.

SOURCES: Florida Department of Environmental Protection; Environmental Protection Agency



Q (25) **What can be done to mitigate the impacts of accidental spills if and when they occur?**

A Spill mitigation occurs on two fronts: prevention and response. Both were profoundly influenced after 11 million gallons of oil spilled from the Exxon Valdez into Prince William Sound in 1989. The spill and its aftermath spurred passage of the Oil Pollution Act (OPA) of 1990, which established prevention, response, liability and compensation protocols. OPA set new standards for vessel construction, mandated contingency planning and broadened enforcement authority and liability limits for companies. A significant drop over the past two decades in the incidence of accidents involving the transport of oil is widely attributed to OPA.

On the prevention front, the federal government requires companies operating offshore facilities and tankers to prepare spill response plans. As part of those plans, the owners of the facilities and vessels have contracts with oil spill response teams that react on the owners' behalf. Tanker owners must maintain evidence of insurance to cover cleanup costs. OPA makes companies liable for all cleanup costs associated with a spill, including damage to natural resources, the loss of personal property and economic losses to states and private entities affected by a spill. Cleanup equipment and procedures are required by law to be in place at offshore facilities. The federal government maintains a trust, funded by a tax on every barrel. It is dedicated to cleanup costs in the event of a significant spill.

As the federal government moved to pass OPA, Florida was adopting laws to address spill prevention, preparedness and response. However, the state has no rules for offshore activities and would need to create a body of regulations addressing contingency plans and bonding requirements specific to accidents off its shoreline. There is an offshore precedent in Florida, created when Coastal Petroleum was required by the state to post a \$4 billion bond when seeking a Gulf permit in the 1990s. That bond was ultimately reduced to \$225 million after an administrative hearing, but it was never posted and the drilling never occurred. The state has requirements for contingency plans and bonding for onshore activities, but the rules and the bonding amounts are inadequate for offshore activities.

On the response front, every spill is unique and presents its own set of variables that influence the cleanup. The first priority is to contain the spill, followed by a cleanup. A variety of methodologies exist to mitigate the impacts of a spill. They range from booms to situational burning off of the oil; skimmers and dispersants like foam, among other options. The method used depends on the spill and on-scene conditions such as weather. A dispersant might be used to lessen the impact on mangroves, for example, or booms to contain heavy, floating oil. The strategy would have to be approved by the federal on-scene coordinator.



OPA enhanced the federal government's authority during emergencies. The federal government takes the lead when an accidental spill occurs, working closely with state responders. Under both federal and state law, the company spilling the oil is responsible for the cleanup. However, if the company does not respond appropriately there are procedures in place to have the government take over. The United States Coast Guard is the lead agency in responding to accidental spills, both in the Outer Continental Shelf and closer to shore where states control submerged lands. The Coast Guard prepares area contingency plans in conjunction with state agencies like the FDEP and the Fish & Wildlife Conservation Commission, local agencies, and the industry. The Coast Guard is ultimately responsible for ensuring that all the oil is removed after a spill and the discharge is stopped.

The National Oceanic and Atmospheric Administration (NOAA) assists by collecting data and assessing environmental damage. To ensure that money is readily available and that private parties are compensated for damages, OPA created the Oil Spill Liability Trust Fund in 1991, and established the National Pollution Funds Center to manage it. An 8-cents-per-barrel tax is assessed to maintain the spill fund. The fund is expected to reach \$3.5 billion by 2016, a year before the tax is set to terminate. At the state level, a 2 cents-per-barrel fee assessed on all petroleum entering the state supports the Florida Coastal Protection Fund. The fund has a \$50 million ceiling that under current law could be expanded to \$100 million if offshore activities are allowed.

SOURCES: Oil Pollution Act; Congressional Research Service report, Oil Spills in U.S. Coastal Waters: Background, Governance, and Issues for Congress; United States Coast Guard; Florida Department of Environmental Protection.



Platform from 500 feet



Platform from 1 mile



Platform from 3 miles



Platform from 6 miles

Shot in the partially protected waters of the Mississippi Sound, these photographs focus on a bay platform that stands 40 feet by 40 feet wide and 50 feet high.

Q (26) **What would various types of drilling rigs and production platforms look like at various distances? How far offshore would one have to be for it not to be seen?**

A Basic trigonometry calculations suggest that on a clear day many offshore oil rigs could be detected by the naked eye in Florida waters. That would certainly be true if they were allowed within five statute miles. For most rigs on the far side of state waters (beyond six miles) the visual image would be tiny – in some cases barely a speck on the horizon. Obviously, the larger the rig and the closer it is to the shoreline the more noticeable it becomes. How obtrusive one considers this to be is a matter of individual taste. Photographs taken by the Mississippi Development Authority for a study on the visual impacts show that a 50-foot-high production platform three miles from shore is visible enough to be identifiable as an oil platform. At six miles, it becomes a speck on the horizon. Generally speaking, for a 6-foot-tall person the visible horizon is 3 miles away. For that same person, a 100-foot structure is visible about 10 miles away. For people living in beach-front condos or staying in beach-front hotels, the rigs and platforms would be visible at greater distances, depending upon the height of the condo or room. Someone looking seaward from the 14th floor could see a 50-foot rig as far as 25 miles offshore; a 100-foot rig about 30 miles offshore.

SOURCES: Jack Moody, Natural Resources Specialist, Mississippi Development Authority. Professor Robert H. Weisberg, College of Marine Science, University of South Florida.

AESTHETICS AND ECONOMIC/OPPORTUNITY COSTS

Q (27) What do we know about the potential impacts of offshore drilling on real estate values?

A There is no doubt that an accidental oil spill can temporarily depress real estate values, but there is little systematic evidence of the potential magnitude or duration of such impacts. The timing and severity of a given spill would likely be a critical determinant of its impact on real estate. More often than not, many factors will affect short-term trends in real estate that would confound the ability to detect the impact of an accidental spill in the absence of sophisticated econometric analysis.

Florida's pristine beaches and captivating vistas are a fundamental part of its identity and allure. If the state's beach quality, vistas and overall experience were significantly degraded by oil and gas activities the result could include an impact on real estate value. Anecdotal information from the real estate industry suggests that prospective clients could also be deterred by the perception of risk posed by oil and gas development near the coastline. While this might certainly be true for particular buyers, there is no evidence to support a generalized sentiment that would manifest itself in declining demand for real estate. It is possible that rigorous research could provide such evidence, but none has been done to date and made publicly available.



Q (28) What do we know about the potential impacts of offshore drilling on tourism?

A Clearly, an accidental spill can have a significant impact on local tourism. A catastrophic accident would have statewide impact if it changed perceptions of Florida on a large enough scale. Generally speaking, however, coastal hazard impacts tend to be localized. Despite media reports to the contrary, we could not verify claims of tourism sector losses exceeding \$1 billion in any U.S. oil spill, although cleanup costs after the Exxon Valdez spill did exceed that figure.

Part of the difficulty of calculating economic impacts caused by coastal hazards is the fact that much of the economic activity affected by the hazard is displaced rather than lost. A vacationing family that refrains from eating at a waterfront restaurant after a spill may instead eat at another restaurant farther inland. The waterfront restaurant loses revenue as a result of this decision, but the inland restaurant gains a comparable amount. The net impact on the broader community visited by the family is probably negligible. If a family changes its vacation plans after a spill, traveling to Orlando instead of Naples, then Naples loses revenue but the state does not. If a family chooses to avoid Florida or cancel its travel plans because of drilling concerns then the state loses revenue. Credible assessments of tourist impacts associated with accidental oil spills require caution with respect to their methodology. Generalizations based on extrapolations of data beyond the geographic areas or segments of the tourist sector from which the data were collected are problematic.

With respect to the mere presence of oil and gas infrastructure within sight of the Florida coastline, the potential impacts on tourism are unclear. If day-to-day oil and gas operations had a discernible impact on Florida's beach quality, vistas and/or overall experience, then a loss of tourist revenue could be expected. This could also result from impacts on salient features of coastal ecosystems. In the absence of any discernible change to the Florida tourist experience, however, the impact of oil and gas infrastructure would probably be negligible.

AESTHETICS AND ECONOMIC/OPPORTUNITY COSTS

Q (29) **Can offshore-compatible sand resources needed for beach restoration be protected from exploration and production activity?**

A The potential for conflict among competing interests is high. There is a limited amount of beach-quality sand available in Florida's inshore and near-shore waters, and areas containing valuable sand overlap with areas having the potential for oil and gas. In addition to conflicts of interest with respect to specific spatial areas there is also the potential for conflicting demands on the capacity to respond to storm damage. Many of the vessels and much of the equipment that would be needed to respond to damaged industry infrastructure might also be needed for beach renourishment. It would seem that detailed plans and procedures would be necessary to resolve these potential conflicts. Such plans and procedures do not yet exist.

Approximately half of Florida's beaches are designated by the state as critically eroded. The state Legislature has recognized that beach-quality sand for the nourishment of the state's critically eroded beaches is an exhaustible resource that is in ever-decreasing supply and must be carefully managed. The Florida Department of Environmental Protection maintains an inventory of identified offshore sand sources as part of the regional elements of its comprehensive long-term beach management plan. Offshore sand sources in state or federal waters which have been identified for potential, proposed, or permitted use are clearly mapped or otherwise noted and readily available for public review.

As of yet, Florida does not appear to have any plans or procedures for resolving conflicts that could arise among oil and gas exploration and development interests, and beach restoration interests. However, recent agreements between the Florida Department of Environmental Protection, local governments in Manatee County, and a company proposing to build a 28-mile submerged natural gas pipeline to Port Manatee may have set a precedent. Longboat Key representatives protested the pipeline, arguing it inhibited access to beach-quality sand for nourishing the island's beaches. The agreement requires payment by the company to accelerate the dredging of submerged offshore sand so it can be applied to authorized beach nourishment projects. Conflicts of this type would probably be addressed through an overarching marine spatial planning process.

With respect to the reconciling of competing emergency response needs, this is an issue that could be considered in emergency preparedness and post-disaster redevelopment planning processes.

SOURCES: FDEP; Gary Appelson, Caribbean Conservation Corporation and Sea Turtle Survival League



AESTHETICS AND ECONOMIC/OPPORTUNITY COSTS

Q (30) **Can military exercises in state and federal waters be protected from exploration and production activity?**

A Ultimately, it is the Secretary of Defense who will determine whether exploration and production activity in the Eastern Gulf of Mexico is compatible with military training exercises. Statements from past defense secretaries and current commanding officers at Eglin Air Force Base suggest that the potential for conflict does exist.

The primary military concerns over drilling in the Eastern Gulf arise from fears that commercial operations would interfere with training activities, either by putting civilians or drilling infrastructure at risk from falling debris or by exposing training missions to observation. These concerns were articulated by military personnel and stakeholder interest groups in testimony to the House Select Policy Council on Strategic and Economic Planning and House Military Affairs and Local Policy Committee.

Two recently released reports from offshore drilling lobbying groups (Securing America's Future Energy, or SAFE, and the American Petroleum Institute, or API) downplay these concerns. They claim that while there are risks of encroachment from certain military activities, the risks are minimal and should not be considered as a stumbling block for exploration and development. Information gathered through Freedom of Information requests is used by SAFE to argue that the areas that the military wants to protect are used infrequently.

However, it must be noted that the validity of the arguments made by SAFE and API have yet to be confirmed by the military officials at Eglin Air Force base or the Department of Defense. Senator Bill Nelson's office reports that legitimate concerns were raised by Secretary of Defense William Gates in a 2007 letter to Senator Nelson. More recently, in testimony to the House Military Affairs and Local Policy Committee, Eglin Air Force Base Commander Col. Bruce McClintock reiterated concerns regarding the problems drilling could pose to military exercises. In the end, it will be up to the Department of Defense, in consultation with the Department of Interior, to determine if competing uses of the areas in question are compatible.

Q (31) **Can other existing or contemplated ocean and coastal activities (marine protected areas, aquaculture, tidal energy, wind farms, LNG facilities) be affected by offshore drilling?**

A There are a number of potential conflicts between oil and gas activity and competing uses of the marine environment besides sand resources and military exercises. These competing uses could include protection of essential fisheries habitat that may or may not be located in marine protected areas, alternative energy development, offshore aquaculture, and siting of additional liquid natural gas facilities, to name a few. Marine spatial planning (analogous to comprehensive management planning for marine waters) is a potential mechanism for resolving these disputes, but Florida has yet to develop such a process.

Over the past few decades, the state has taken several steps toward development of a comprehensive ocean policy. In 1988-89, the first initiative was taken, resulting in improved procedures for scientific data gathering, resource inventorying and mapping. In 1998 and 1999, Governor Lawton Chiles' ocean initiative led to the creation of the Florida Oceans and Coastal Council, which is charged with developing priorities for ocean and coastal research. In 2008 and 2009, the Florida Coastal and Ocean Coalition, which comprises public interest groups, released its reports on the need for comprehensive ocean and coastal management, and in 2009 the Florida Ocean Alliance, a non-profit, public-private partnership that promotes awareness and understanding of the ocean's importance to the ecology and economy of Florida, released a report proposing strategies for moving toward a Florida Ocean Management Plan. To date, however, none of these initiatives have led to a comprehensive state ocean policy for Florida.

The use of marine spatial planning as a policy tool is gaining momentum in the United States and around the world. Within the United States, Massachusetts has led the way with its Oceans Act of 2008, legislation that will require the state to develop a first-in-the-nation comprehensive plan to manage development in Massachusetts state waters, balancing natural resource preservation with traditional and new uses. A number of international examples of marine spatial planning have been reviewed under a Marine Spatial Planning Initiative conducted by the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization. Ample amounts of information in the form of case histories and lessons learned can now be accessed on this policy tool.

In September 2009, The White House Council on Environmental Quality released a report prepared by the Interagency Ocean Policy Task Force on marine spatial planning. The report outlined a framework that would operate on a regional scale with the Gulf of Mexico region constituting one of nine planning areas. Despite its regional operational scale, the report emphasizes the importance of better coordination between federal, state and local governments throughout each region. Better coordination, in turn, could result from embedding state-level marine spatial planning processes within the regional framework being developed by the federal government.

SOURCES: Donna Christie, Associate Dean for International Programs, Florida State University College of Law; Massachusetts Office of Coastal Zone Management; NOAA; IOC-UNESCO.

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