**Center for Regulatory Effectiveness ("CRE")**
**Comments on Bureau of Ocean Energy Management ("BOEM")**
**Supplemental Environmental Impact Statement for**
**Proposed Western Planning Area (WPA)**
**Lease Sale 233 and Central Planning**
**Area (CPA) Lease Sale 231 (SEIS),**
**http://www.gpo.gov/fdsys/pkg/FR-2012-07-09/pdf/2012-16732.pdf .**

**Comments Submitted by Express Mail on August 6, 2012, to**
**Mr. Gary D. Goeke, Chief, Regulatory Assessment Section, Office of Environment (MS 5410), Bureau of Ocean Energy Management, Gulf of Mexico OCS Region, 1201 Elmwood Park Boulevard, New Orleans, Louisiana 70123-2394, telephone (504)736-3233**

# I. Executive Summary

Oil and gas seismic should not be a major issue in the SEIS.

Recent assessments by BOEM and others show that seismic and other oil and gas G&G have not caused any harm in the Gulf of Mexico ("GOM") under current, long standing regulation. There is no need or basis for seismic regulation which is more stringent than that imposed by BOEM's JOINT NTL No. 2012-G02, *Notice to Lessees and Operators of Federal Oil, Gas, and Sulphur Leases in the OCS, Gulf of Mexico Region, Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program*, available online at http://www.bsee.gov/Regulations-and-Guidance/Notices-to-Lessees/2012/2012-JOINT-G02-pdf.aspx . Significantly more stringent seismic regulation would be inconsistent with several recent BOEM Environmental Impact Statements ("EIS").

BOEM could not significantly change its current regulation of GOM seismic without new Information Collection Requests ("ICR") by BOEM and new Paperwork Reduction Act ("PRA") approvals by the Office of Management and Budget ("OMB"). New ICRs for more stringent seismic regulation should not be submitted or approved because the current ICRs would not have been submitted and approved if current regulation were inadequate. There's been no change in knowledge since the current ICRs were submitted and approved that would justify more stringent regulation.

Neither the SEIS nor any other document by any agency should use the Acoustic Integration Model ("AIM") until and unless external peer review states (i) that adequate behavioral effects data exist for AIM's application in the GOM, and (ii) that AIM is otherwise sufficiently accurate and

reliable for application in the GOM. Until and unless this occurs, BOEM and other agencies should continue to use line transect to estimate exposure and Takes.

Passive Acoustic Monitoring ("PAM") should be required in the GOM, and PAMGUARD should be encouraged. This is not a significant change in current regulation because PAM is already being required in most NMFS regulation of seismic, and it is "strongly encouraged" by BOEM's NTL 2012 G0-2. Recent research shows that PAM detects some species of marine mammals that are rarely if ever visually detected, and that PAM increases detection of other species when visual sighting conditions are poor.

## II. There is No Basis for More Stringent Seismic Regulation In the GOM

BOEM recently published a Final Environmental Impact Statement for Gulf of Mexico OCS Oil and Gas Lease Sales: 2012-2017; Western Planning Area Lease Sales 229, 233, 238, 246, and 248; Central Planning Area Lease Sales 227, 231, 235, 241, and 247. This final EIS for the GOM states:

> "Within the WPA, there is a long-standing and well-developed OCS Program (more than 50 years); there are no data to suggest that activities from the preexisting OCS Program are significantly impacting marine mammal populations."[1]

This final EIS further states:

> "Although there will always be some level of incomplete information on the effects from routine activities under a CPA proposed action on marine mammals, there is credible scientific information, applied using acceptable scientific methodologies, to support the conclusion that any realized impacts would be sublethal in nature and not in themselves rise to the level of reasonably foreseeable significant adverse (population-level) effects. Also, routine activities will be ongoing in the CPA proposed action area as a result of active leases and related activities. As of May 2012, there are 4,377 active leases in the CPA. Within the CPA, there is a long-standing and well-developed OCS Program (more than 50 years); there are no data to suggest that routine activities from the preexisting OCS Program are significantly impacting marine mammal populations.
>
> Summary and Conclusion

[1] Vol. 1, Page 4-215, available online at http://www.boem.gov/Environmental-Stewardship/Environmental-Assessment/NEPA/nepaprocess.aspx

> Some routine activities related to a CPA proposed action have the potential to have adverse, but not significant impacts to marine mammal populations in the GOM. Impacts from vessel traffic, structure removals, and seismic activity could negatively impact marine mammals; however, when mitigated as required by BOEM and NMFS, these activities are not expected to have long-term impacts on the size and productivity of any marine mammal species or population. Most other routine activities are expected to have negligible effects."[2]

These recent EIS statements about the GOM are correct. There is no reason or basis to contradict them in the SEIS or in any other document disseminated by BOEM or any other agency.

These recent EIS statements are also consistent with other statements about OCS seismic. For example, with regard to oil and gas G&G in the Arctic, NMFS states:

> "There is no specific evidence that exposure to pulses of airgun sound can cause PTS [physical injury] in any marine mammal, even with large arrays of airguns."
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> ***
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> "To date, there is no evidence that serious injury, death, or stranding by marine mammals can occur from exposure to airgun pulses, even in the case of large airgun arrays."
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> ***
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> "NMFS does not expect any marine mammals will incur serious injury or mortality in the Arctic Ocean or strand as a result of the proposed seismic survey."
>
> ***
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> "Thus, the proposed activity is not expected to have any habitat-related effects on prey species that could cause significant or long-term consequences for individual marine mammals or their populations."
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> ***
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> "Data on short-term reactions by cetaceans to impulsive noises are not necessarily indicative of long-term or biologically significant effects. It is not known whether impulsive sounds affect reproductive rate or distribution and habitat use in subsequent days or years. However, gray whales have continued to migrate annually along the west coast of North America despite intermittent

[2] Vol. 2, page 4-710, available online at http://www.boem.gov/Environmental-Stewardship/Environmental-Assessment/NEPA/nepaprocess.aspx

> seismic exploration (and much ship traffic) in that area for decades (Appendix A in Malme *et al.* 1984; Richardson *et al.* 1995), and there has been a substantial increase in the population over recent decades (Allen and Angliss 2010). The western Pacific gray whale population did not seem affected by a seismic survey in its feeding ground during a prior year (Johnson *et al.* 2007). Similarly, bowhead whales have continued to travel to the eastern Beaufort Sea each summer despite seismic exploration in their summer and autumn range for many years (Richardson *et al.* 1987), and their numbers have increased notably (Allen and Angliss 2010). Bowheads also have been observed over periods of days or weeks in areas ensonified repeatedly by seismic pulses (Richardson *et al.* 1987; Harris *et al.* 2007). [3]

A recent NMFS Biological Opinion similarly concludes that marine mammals are flourishing and increasing in the Arctic during increasing oil and gas seismic activities there:

> "Data indicate that bowhead whales are robust, increasing in abundance, and have been approaching (or have reached) the lower limit of their historic population size at the same time that oil and gas exploration activities have been occurring in the Beaufort Sea and, to a lesser extent, the Chukchi Sea."
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> "To our knowledge, no whales or other marine mammals have been killed or injured by these past seismic operations, and the BCB population of bowhead whales continues to increase at an annual rate estimated more than 3 percent."[4]

BOEM, when it was still MMS, concluded with regard to the entire Outer Continental Shelf that:

> "[T]here have been no known instances of injury, mortality, or population level effects on marine mammals from seismic exposure…."[5]

In reaching this conclusion, BOEM relied on a report by the National Academy of Sciences' National Research Council, which states:

> "With the exception of the beaked whale strandings, connections between anthropogenic sound in the oceans and marine mammal deaths have not been documented. In the presence of clear evidence of lethal interactions between humans and marine mammals in

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[3] NMFS' Federal Register notice available online at http://www.gpo.gov/fdsys/pkg/FR-2012-05-01/pdf/2012-10386.pdf .

[4] Pages 64-65, ENDANGERED SPECIES ACT: SECTION 7 CONSULTATION BIOLOGICAL OPINION, Incidental harassment authorization to allow for incidental takes of marine mammals during shallow hazards survey in the Chukchi Sea, Alaska, 2011 (NMFS 2011), available online at http://www.nmfs.noaa.gov/pr/pdfs/permits/statoil_biop2011.pdf .

[5] See, *e.g.*, Outer Continental Shelf Oil & Gas Leasing Program,2007-2012 Final Environmental Impact Statement, page V-64 (MMS April 2007), available online at http://www.boemre.gov/5-year/2007-2012DEIS/VolumeII/5and6-ConsultationPreparers.pdf .

> association with fishing and vessel collisions (Clapham et al., 1999; Laist et al., 2001), the absence of such documentation has raised the question of the relative importance of sound in the spectrum of anthropogenic effects on marine mammal populations. Anthropogenic ocean noise is thought not to be a factor in any of the recent major declines in marine mammal populations, such as Steller sea lions (*Eumetopias jubatus*; NRC, 2003a), harbor seals (*Phoca vitulina*; Pitcher, 1990), fur seals (York, 1987), and Aleutian Island sea otters (*Enhydra lutris*; Doroff et al., 2003). No scientific studies have conclusively demonstrated a link between exposure to sound and adverse effects on a marine mammal population."[6]

BOEM itself recently issued a Final Supplemental Environmental Impact Statement for a Gulf of Mexico OCS Oil and Gas Lease Sale. This final SEIS for the GOM concludes that, despite more than 50 years of oil and gas G&G, "there are no data to suggest that activities from the preexisting OCS Program are significantly impacting marine mammal populations":

> "Overall, within the CPA [GOM Central Planning Area], there is a long-standing and well-developed OCS [oil and gas] Program (more than 50 years); there are no data to suggest that activities from the preexisting OCS Program are significantly impacting marine mammal populations."[7]

BOEM reached the same conclusion in still another Final Supplemental Environmental Impact Statement for a Gulf of Mexico OCS Oil and Gas Lease Sale:

> "Although there will always be some level of incomplete information on the effects from routine activities under this proposed action on marine mammals, there is credible scientific information, applied using acceptable scientific methodologies, to support the conclusion that any realized impacts would be sublethal in nature and not in themselves rise to the level of reasonably foreseeable significant adverse (population level) effects. Also, routine activities will be ongoing in the proposed action area (WPA) as a result of existing leases and related activities. (In the WPA, there are 1,394 active leases [USDOI, BOEMRE, 2011]). Within the WPA, there is a long-standing and well-developed OCS program (more than 50 years); there are no data to suggest that routine activities from the pre-existing OCS program are significantly impacting marine mammal populations. Therefore, a full understanding of any incomplete or unavailable information on the effects of routine activities is not essential to make a reasoned choice

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[6]Marine Mammal Populations and Ocean Noise: Determining when Noise causes Biologically Significant Effects, Oceans science board (2005), page 15, available online at http://www.nap.edu/openbook.php?isbn=0309094496 .

[7] Vol. 1, page 4-231 of document available online at http://www.boem.gov/Environmental-Stewardship/Environmental-Assessment/NEPA/nepaprocess.aspx . Click on "Gulf of Mexico OCS Oil and Gas Lease Sale: 2012; Central Planning Area Lease Sale 216/222; Final Supplemental Environmental Impact Statement; Volume I: Chapters 1-4; Volume II: Chapters 5-8, Appendices, and Keyword Index."

among the alternatives."[8]

There is no reason or basis for reaching a different conclusion in this SEIS. A different conclusion, and significantly more stringent seismic regulation, would conflict with several recent BOEM EISs.

## III. More Stringent Seismic Regulation in the GOM Would Require A New ICR and OMB review

CRE previously filed two comments which are relevant to the SEIS and seismic.[9] BOEM's responses to these two comments agree with CRE on an important point: BOEM will have to prepare a new ICR for public comment and for OMB review before BOEM could regulate seismic in a manner that is significantly more stringent than current regulation under NTL No. 2007-G02.

With regard to the first CRE comments, on September 30, 2011, BOEM published Federal Register notice that BOEM was submitting an ICR to OMB for review. This notice responds to comments that CRE submitted on BOEM's draft ICR for regulations that apply to offshore seismic.[10]

With regard to the second CRE comments, on October 21, 2011, BOEM published Federal Register notice that BOEM was submitting another ICR to OMB for review. This notice responds to comments that CRE submitted on another BOEM draft ICR for another set of regulations that apply to offshore seismic.[11]

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[8] Gulf of Mexico OCS Oil and Gas Lease Sale: 2011 Western Planning Area Lease Sale 218 Final Supplemental Environmental Impact Statement ,Volume I, page 4-147, available online at http://www.boem.gov/Environmental-Stewardship/Environmental-Assessment/NEPA/nepaprocess.aspx .

[9] CRE's comments on the September 30th ICR are available in www.regulations.gov, Docket ID # BOEM-2011-0011-0003, http://www.regulations.gov/#!documentDetail;D=BOEM-2011-0011-0003 . CRE's comments on the October 21st ICR are available in www.regulations.gov, Docket ID # BOEM-2011-0036-0003, http://www.regulations.gov/#!documentDetail;D=BOEM-2011-0036-0003.

[10] BOEM's September 30, 2011 Federal Register notice of the ICR's submission to OMB is available online at http://www.gpo.gov/fdsys/pkg/FR-2011-09-30/html/2011-25262.htm . The OMB file for this ICR is available online at http://www.reginfo.gov/public/do/PRAViewICR?ref_nbr=201108-1010-003 .

[11] BOEM's October 21, 2011 Federal Register notice of the ICR's submission to OMB is available online at http://www.gpo.gov/fdsys/pkg/FR-2011-10-21/html/2011-27331.htm . The OMB file for this ICR is available online at http://www.reginfo.gov/public/do/PRAViewICR?ref_nbr=201106-1010-004

BOEM's September 30th Federal Register notice explains:

> "We received two comments in response to the Federal Register notice. The first comment, from the Marine Mammal Commission, supported our request to OMB. The second comment, from the Center for Regulatory Effectiveness, requested that we should state that we are not submitting any ICRs for seismic regulations that are more stringent than current regulations, including NTL 2007-G02. Response: For the renewal of this ICR, we are not requesting anything more stringent than in current NTL 2007-G02 and 30 CFR 250, subpart B regulations, which are covered under OMB Control Number 1010-0151. We have no plans, at this time, to change the content of or the resultant burdens imposed by NTL 2007-G02. Therefore, BOEMRE should move forward with the required information collection to ensure compliance with OMB deadlines. If the lawsuit settlement or resulting decree requires changes to the NTL and/or DOI regulations, information collection coordination and OMB approval will occur before any NTL is reissued or regulations are promulgated."[12]

Similarly, BOEM's October 21st Federal Register Notice explains:

> "We received two comments in response to the Federal Register notice. The first commenter, the Marine Mammal Commission stated that it was in support of our submission to OMB. The second commenter, Center for Regulatory Effectiveness, requested two actions. One, that we should state that we are not submitting any ICR for seismic regulations that is more stringent than current regulations, including NTL 2007-G02. Response: For the renewal of this ICR, we are not requesting anything more stringent than in current 30 CFR 551 regulations; NTL 2007-G02 is covered under OMB Control Number 1010-0151. Second, that we wait to submit the ICR to OMB. There is current on-going litigation pertaining to seismic regulations (BOEM vs environmental plaintiff(s)). Response: This particular ICR renewal pertains mostly to revising the form currently in use due to new developments in technology; we are not requesting any new requirements. If the lawsuit settlement or decree requires changes to the form and/or DOI regulations, information collection coordination and OMB approval will occur before the form is reissued or regulations are promulgated.[13]

The referenced NTL No. 2007-G02 is entitled "Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program." Since the above-quoted Federal register notices, BOEM has replaced this 2007 NTL with a 2012 NTL: *Notice to Lessees and*

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[12] Page 60681 of BOEM's September 30, 2011 Federal Register notice of the ICR's submission to OMB, available online at http://www.gpo.gov/fdsys/pkg/FR-2011-09-30/html/2011-25262.htm .

[13] http://www.gpo.gov/fdsys/pkg/FR-2011-10-21/html/2011-27331.htm, page 65523. In the above-quoted Federal Register notices, BOEM responds to CRE comments which explain in greater detail that environmental group plaintiffs are suing BOEM in New Orleans federal court over regulation of seismic in the GOM. CRE's ICR comments state concerns regarding the regulatory impact of any settlement, and the need for public comment on and OMB review of any such impact.

*Operators of Federal Oil, Gas, and Sulphur Leases in the OCS, Gulf of Mexico Region, Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program.*[14] This 2012 NTL is substantially the same as the 2007 NTL. The 2012 NTL states that it

> "supersedes and replaces NTL No. 2007-G02. It does not introduce any new types of mitigation measures; however, it clarifies how you should implement seismic survey mitigation measures, including ramp-up procedures, the use of a minimum sound source, airgun testing and protected species observation and reporting. The measures contained herein apply to all onlease/ancillary activity surveys you conduct under 30 CFR 550 and all off-lease surveys you conduct under 30 CFR 551."[15]

The 2012 seismic NTL is not significantly more stringent than the 2007 seismic NTL.

CRE's ICR comments referenced above explain that, for at least two reasons, BOEM should not send OMB any revised ICRs for seismic regulation that is more stringent than currently imposed by its 2012 seismic NTL. First, BOEM has repeatedly and correctly stated that current regulation of seismic adequately protects the environment. In other words, current regulation of seismic is all that's necessary for the proper performance of BOEM's functions. Therefore, under the Paperwork Reduction Act BOEM should not submit, and OMB should not approve, ICRs for more stringent seismic regulation. Such ICRs would violate the PRA because they would be unnecessary for proper performance of BOEM's functions.

Second, any ICRs for more stringent seismic regulation would also violate the accuracy requirement of BOEM's Information Quality Act Guidelines. The PRA requires that BOEM certify that ICRs are necessary for the proper performance of BOEM's functions. That certification would be inaccurate in the case of ICRs for more stringent seismic regulation. Current regulation of seismic, and ICRs based on current regulation, are all that is necessary for proper performance of BOEM's functions.

CRE's comments on these two ICRS are incorporated by reference into these comments by CRE on the SEIS. [16]

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[14] This document is available online at http://www.bsee.gov/Regulations-and-Guidance/Notices-to-Lessees/2012/2012-JOINT-G02-pdf.aspx .

[15] *Id.*

[16] CRE's comments on the September 30th ICR are available in www.regulations.gov, Docket ID # BOEM-2011-0011-0003, http://www.regulations.gov/#!documentDetail;D=BOEM-2011-0011-0003 . CRE's comments on the October 21st ICR are available in www.regulations.gov, Docket ID # BOEM-2011-0036-0003, http://www.regulations.gov/#!documentDetail;D=BOEM-2011-0036-0003 .

# IV. Line Transect Should Be Used to Estimate Marine Mammal Exposures and Takes from Seismic. The AIM Model Should Not be Used.

Under the Marine Mammal Protection Act ("MMPA"), NMFS uses line transect, and not AIM, to estimate marine mammal exposures and Takes from seismic, and to authorize seismic IHAs. For example, see the following, all of which use some form of line transect analysis to estimate exposures and Takes. None of them use AIM or any other marine mammal exposure model:

● BP oil and gas IHA for the Beaufort, available online at http://www.nmfs.noaa.gov/pr/pdfs/fr/fr77-40007.pdf ;

● Shell oil and gas IHA for Chukchi, available online at http://www.nmfs.noaa.gov/pr/pdfs/fr/fr76-69958.pdf ;

● Shell oil and gas IHA for the Beaufort, available online at http://www.nmfs.noaa.gov/pr/pdfs/fr/fr76-68974.pdf ;

● L-DEO/ NSF IHAs for three seismic surveys in Northeast Pacific, available online at http://www.gpo.gov/fdsys/pkg/FR-2012-07-16/pdf/2012-17258.pdf ;

● Apache Alaska Corporation oil and gas IHA for Cook Inlet Alaska, page 58485, available online at http://www.nmfs.noaa.gov/pr/pdfs/fr/fr76-58473.pdf ;

● L-DEO IHA for Western Gulf of Alaska, available online at http://www.nmfs.noaa.gov/pr/pdfs/fr/fr76-26255.pdf ;

● Scripps IHA for South-Eastern Pacific, available online at http://www.nmfs.noaa.gov/pr/pdfs/fr/fr77-27189.pdf ;

● L-DEO IHA for Northwest Pacific, available online at http://www.nmfs.noaa.gov/pr/pdfs/fr/fr77-4765.pdf ;

●L-DEO IHA for Northern Mariana Islands, available online at http://www.nmfs.noaa.gov/pr/pdfs/fr/fr76-77782.pdf ; and

● University of Alaska Geophysics Institute for the Arctic, available online at http://www.nmfs.noaa.gov/pr/pdfs/fr/fr76-41463.pdf ;

In 2004, BOEM applied to NMFS for MMPA rules authorizing oil and gas seismic in the GOM. BOEM's 2004 application uses line transect to estimate marine mammal exposures and Takes. It does not use AIM. BOEM supplemented its application in 2011. The 2011 application uses the AIM model to estimate marine mammal exposures and Takes.[17]

[17] *Compare* 2004 MMS/BOEM application to NMFS for GOM seismic rules (using line

For the following reasons, the SEIS, and all other actions by BOEM and other agencies, should use line transect, and not AIM to assess marine mammal exposures and takes.

First, NMFS uses line transect and not AIM to assess exposures and Takes and to issue IHAs. Second, using AIM would not meet IQA requirements because AIM has never been peer reviewed for the GOM and because the behavioral effects data input into the model are inadequate to assess exposures and estimate Takes.

With regard to this second reason, NMFS had AIM externally peer reviewed in 2006. This peer review report stated that

> "The three terms of reference required that the Panel evaluate whether AIM correctly implements the models and data upon which it is based; whether animal movements are adequately simulated; and whether AIM meets the Council for Regulatory Monitoring [sic] (CREM) guidelines for model development and evaluation."
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> ***
>
> "The Panel agreed that AIM appears to be correctly implemented. However, all panelists had recommendations for further testing to be undertaken. They also agreed that animal movement appears to be appropriately modelled within AIM given the inadequacies of the available data.
>
> With regard to whether AIM satisfies the CREM guidelines there was some diversity of opinion. This is understandable given that the CREM guidelines are not *directly* applicable to AIM since it is not an application model (but a tool for developing such models)."
>
> ***
>
> "It follows, that the Panel agree that the use of AIM can lead to models which will meet the CREM guidelines. However, such models, at this stage, would need to be evaluated on a case-by-case basis (i.e., merely using AIM is not sufficient; it must be used appropriately for the specific application)."[18]

There is no public record showing that AIM has been peer reviewed for its application in the GOM. If BOEM believes that peer review of AIM application in the GOM has occurred, then BOEM should identify those peer reviews in the public record, and BOEM should allow public comment on those peer reviews.

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transect), available online at http://www.nmfs.noaa.gov/pr/pdfs/permits/mms_gom_seismic_application2004.pdf, *with* BOEM's 2011 Supplemental Application (using AIM), available online at http://www.nmfs.noaa.gov/pr/pdfs/permits/boemre_application2011.pdf .

[18] AIM Peer Review, page 1, available online at http://www.nmfs.noaa.gov/pr/pdfs/permits/lfa_aim_review.pdf.

All peer review of AIM should be performed in accordance with OMB's Peer Review Bulletin.[19]

All peer review should to determine the reviewed AIM application's compliance with CREM Guidelines.[20]
The AIM peer reviewers should be advised of the IQA requirements applicable to BOEM. As OMB explained to EPA in a peer review proceeding:

> "Since the development of Agency Information Quality (IQ) guidelines required by statute, many agencies have been using [peer review] charge language that tracks with the standards of their own IQ guidelines. For example, such language often focuses on whether or not the information in question is accurate, clear, complete, transparently and objectively described, and scientifically justified. We believe it may be useful for EPA to follow a similar approach and incorporate some of the language from your IQ guidelines into the formulation of the [peer review] charge questions."[21]

The 2006 Aim Peer Review Report concluded that the AIM input data are inadequate:

> "It was generally agreed by the Panel that the animal movement methods used in AIM were appropriate given the level of available data. The qualifier is important here. The Panel did not perceive a problem with AIM's animal movement methods. They do acknowledge a problem with the absence of the type of data needed to realistically simulate animal movement within AIM.
>
> Relevant extracts:
>
> • At this point in time, I believe the reliability of AIM to assess the exposure hazard of marine mammals to anthropogenic sound is more limited by the realism of the animate engine module of AIM than the sound propagation modules … animal behavior is far more complicated than behavior of physical systems (Getz 2006).
>
> • … requires that aggregative social, feeding, or predator avoidance behavior of individuals be taken into account. In the absence of data that allows aversion parameters to be set that would simulate such behavior, plausible scenarios need to be investigated under 'what if …?' scenarios that assumed that individuals aggregate for various reasons (Getz 2006)."[22]

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[19] OMB's Peer Review Bulletin is available online at http://www.whitehouse.gov/sites/default/files/omb/assets/omb/memoranda/fy2005/m05-03.pdf .
[20] The CREM Models Guidance is available online at http://www.epa.gov/crem/cremlib.html#guidance .

[21] OMB document available online at http://oaspub.epa.gov/eims/eimscomm.getfile?p_download_id=495502 .
[22] AIM Peer Review, pages 6-7, available online at http://www.nmfs.noaa.gov/pr/pdfs/permits/lfa_aim_review.pdf

The inadequacy of AIM's input data is further demonstrated by the discussion of AIM in BOEM's 2011 Application to NMFS for GOM Take rules under the MMPA. For example,

> "2.6.6 Animal Behavior Parameters
> The specific animal behavioral parameters that were used in this analysis are provided below. Where the "Surfacing/Dive Angle" column is empty, there were no meaningful data available and, as such, 75º was used as a default value…"[23]

There were "no meaningful data available," and "75º" was used as AIM's default value, for the vast majority of marine mammals modeled: *i.e.*, beaked whales; dwarf and pygmy sperm whales; blackfish: false killer whale, pygmy killer whale, melon-headed whale, and pilot whale; killer whales: Risso's dolphin; bottlenose dolphin; stenella: spinner, atlantic/pantropical spotted, and striped dolphins; fraser's dolphin; and rough toothed dolphin.

The 2011 application candidly acknowledges many other inadequacies in the data that AIM uses to model behavioral effects on specific marine mammals in the GoM. For example:

> "Bryde's W hale
> There is a paucity of data for this species. Since they are similar in size, data for both sei and Bryde's whales have been pooled to derive parameters. Note that Sei whales are rare in the Gulf of Mexico, but their similarities to Bryde's whales was used to determine some of their movement parameters.
>
> **"**Surface Time
> No direct data available, fin whale values used.
> Dive Depth
> No direct data available, fin whale values used." [24]
>
> ***
>
> "Beaked W hales
> Data on the behavior of beaked whales are sparse. Therefore, all beaked whale species have been pooled into a single animat" [25]
>
> ***
>
> "Dwarf and Pygmy Sperm Whales (Kogia spp.)
> Data on dwarf and pygmy sperm whales are rare, and these species are very similar, so data for these two species have been combined.[26]
>
> ***
>
> "Blackfish: False K iller Whale, Pygmy Killer Whale, Melon-headed Whale, Pilot Whale

[23] 2011 Application, Appendix A at page 61, available online at http://www.nmfs.noaa.gov/pr/pdfs/permits/boemre_application2011.pdf
[24] *Id* at page 61.

[25] *Id.* at page 64.
[26] *Id*. at page 65.

Studies describing the movements and diving patterns of these animals are rare and sparse. Therefore, they have been combined into a single "blackfish" category. As more data become available, these species will be split into separate animats" [27]

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"Killer Whale
There is a remarkable paucity of quantitative data available for killer whales, considering their coastal habitat and popular appeal. Nevertheless, most data from "blackfish" were used to model *Orcinus orca*, with the exception of dive depth. The different feeding ecology of these species makes very deep dives apparently unnecessary. When additional data allow, separate animats for "resident" and "transient" killer whales will be developed."[28]

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"Risso's Dolphin
**Dive Time**
No data on dive times could be found. The values for blackfish, which have a similar ecological niche, were used."[29]

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"Rough toothed dolphin
**Dive Depth**
No dive depth data are available; depths are based upon other species."[30]

These problems with AIM's input data render the model too inaccurate and unreliable to assess and estimate marine mammal exposures and Takes in the GOM. AIM's use would violate the IQA accuracy and reliability requirements.[31]

[27] *Id* at page 66.

[28] *Id*. at page 68.
[29] *Id* at page 70.
[30] *Id*. at page 74.

[31] The DOI/BOEM IQA requirements are available online, and they won't be discussed in detail here. See http://www.boemre.gov/qualityinfo/PDF/MMSQualityInfoGuidelines-Final.pdf for the MMS/BOEM IQA Guidelines, and http://www.doi.gov/archive/ocio/guidelines/515Guides.pdf for the DOI IQA Guidelines.

# V. The SEIS Should Require PAM and Encourage PAMGUARD

### *A) The SEIS Should Require PAM*

Recent Navy research shows that PAM improves detection of marine mammals:

> "The PAM component of the survey was effective in detecting some species humpback whale (*Megaptera novaeangliae)* and minke whale (*Balaenoptera acutorostrata)* that were infrequently (or never) visually detected, and for other species (e.g., sperm whale [*Physter macrocephalus*] and small groups of delphinids), increased detection rates when visual sighting conditions were poor."[32]

NMFS already routinely includes PAM as a monitoring or mitigation requirement in IHAs, LOAs or rules that NMFS issues under the MMPA. A published article by NMFS' staff discusses NMFS' currently required uses of PAM.[33]

In just the year 2011, NMFS included PAM requirements in, *e.g.*:

● An L-DEO seismic survey in the Western Gulf of Alaska, available online at http://www.nsf.gov/geo/oce/envcomp/shillington-2011-final-ea-23-may.pdf , and issued permit at http://www.nmfs.noaa.gov/pr/pdfs/permits/ldeo_wgoa_issued_iha.pdf ;

● An industry seismic survey in Cook Inlet, Alaska, available online at http://www.nmfs.noaa.gov/pr/pdfs/permits/apache_ak_iha_application2011.pdf ;

● An University of Alaska Geophysics Institute seismic survey in the Arctic Ocean, using PAM , available online at http://www.nmfs.noaa.gov/pr/pdfs/permits/uagi_iha_issued.pdf ;

● An industry seismic IHA for the Chukchi, available online at http://www.nmfs.noaa.gov/pr/pdfs/permits/statoil_iha_issued2011.pdf ; and

● An USGS seismic survey in Central Gulf of Alaska, available online at http://www.nmfs.noaa.gov/pr/pdfs/permits/usgs_goa_iha2011.pdf .

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[32] Department of the Navy, 2012 Annual Marine Species Monitoring Report for the Mariana Islands Range Complex, page 6, available online at http://www.nmfs.noaa.gov/pr/pdfs/permits/mirc2012_monitoring_report.pdf .

[33] "The use of acoustic monitoring in the National Marine Fisheries Service marine mammal incidental take authorizations," Shane Guan, Office of Protected Resources, NOAA/NMFS, presented at 160th Meeting of the Acoustical Society of America (Nov. 15 – 19, 2010), Session 1pAB: Animal Bioacoustics, available online at http://scitation.aip.org/getpdf/servlet/GetPDFServlet?filetype=pdf&id=PMARCW000011000001010002000001&idtype=cvips&doi=10.1121/1.3606451&prog=normal

The Navy and NMFS are also requiring that PAM be used with Navy sonar. With NMFS' concurrence, the Navy stated that "Passive acoustic monitoring for low frequency sounds generated by marine mammals will be conducted when SURTASS [sonar] is deployed."[34]

Recent Brazilian studies have recommended the increased use of PAM to help protect sea life from marine sound:

> *"The possibility of detecting marine mammals by hydrophone arrays linked to special software (Passive Acoustic Monitoring – PAM) has shown promise as a monitoring tool for some species of marine mammal with frequent vocalization (e.g. Swartz et al., 2002; Mellinger, 2004). PAM has been suggested as an alternative or additional technique to improve the effectiveness of monitoring marine mammals (Lewis et al., 1998). This acoustic technique has been used to complement visual surveys during periods of darkness and may have advantages over the visual technique in areas with strong wind and poor visibility (Swartz et al., 2003). Considering all of these factors, it is recommended to start experiments with PAM in Brazilian waters as an auxiliary tool to document the presence of marine mammals during seismic surveys."*[35]

BOEM's *Notice to Lessees and Operators of Federal Oil, Gas, and Sulphur Leases in the OCS, Gulf of Mexico Region, Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program* ("NTL*")* has a section which strongly encourages the use of PAM:

> "**Experimental Passive Acoustic Monitoring**
> Whales, especially sperm whales, are very vocal marine mammals, and periods of silence are usually short and most often occur when these animals are at the surface and may be detected using visual observers. However, sperm whales are at the greatest risk of potential injury from seismic airguns when they are submerged and under the airgun array. Passive acoustic monitoring appears to be very effective at detecting submerged and diving sperm whales, and some other marine mammal species, when they are not detectable by visual observation. BOEM and BSEE strongly encourage operators to participate in an experimental program by including passive acoustic monitoring as part of the protected species observer program. Inclusion of passive acoustic monitoring does relieve an operator of any of the mitigations (including visual observations) in this NTL **with the following exception:** Monitoring for whales with a passive acoustic array by an observer proficient in its use will allow ramp-up and the subsequent start of a seismic survey during times of reduced visibility (darkness, fog, rain, etc.) when such ramp-up otherwise would not be permitted using only visual observers. If you use passive acoustic monitoring, include an assessment of the usefulness, effectiveness, and problems encountered with the use of that method of marine mammal detection in the reports

[34] http://www.surtass-lfa-eis.com/Measures/index.htm .

[35] Effectiveness of Monitoring Marine Mammals during Marine Seismic Surveys off Northeast Brazil, Parente and de Araújo, Journal of Integrated Coastal Zone Management 11(4):409-419 (2011), available online at http://www.aprh.pt/rgci/pdf/rgci-251_Parente.pdf .

> described in this NTL. A description of the passive acoustic system, the software used, and the monitoring plan should also be reported to BSEE at the beginning of its use." [36]

NMFS rejects as impracticable arguments that seismic should shut down during times of poor visibility. NMFS instead requires PAM during these times in order "to further enhance the detection of marine mammals."[37] For the same reason, BOEM should require PAM use in the GOM during times of poor visibility, especially since NMFS is already requiring its use under the MMPA.

**B)** ***The SEIS Should Encourage PAMGUARD***

NMFS recently proposed to issue a seismic IHA to L-DEO which includes PAMGUARD use. NMFS explains here that

> "*Passive Acoustic Monitoring*
> Passive acoustic monitoring will complement the visual monitoring program, when practicable. Visual monitoring typically is not effective during periods of poor visibility or at night, and even with good visibility, is unable to detect marine mammals when they are below the surface or beyond visual range. Acoustical monitoring can be used in conjunction with visual observations to improve detection, identification, and localization of cetaceans. The acoustic monitoring will serve to alert visual observers (if on duty) when vocalizing cetaceans are detected. It is only useful when marine mammals call, but it can be effective either by day or by night, and does not depend on good visibility. The acoustic observer will monitor the system in real time so that he/she can advise the visual observers if they acoustic detect cetaceans. When the acoustic observer determines the bearing (primary and mirror-image) to calling cetacean(s), he/she alert the visual observer to help him/her sight the calling animal(s)….
>
> The acoustic signals received by the hydrophones are amplified, digitized, and then processed by the Pamguard software." [38]

Academic groups (University of St. Andrews, Oregon State University, Herriot Watt University, and Scripps Institute of Oceanography), environmental groups (EcoLogic), and select oil and gas companies (through the International Association of Oil and Gas Producers) have spent considerable time, effort and money developing the freely available version of PAM called PAMGUARD. The PAMGUARD web site discusses PAMGUARD in considerable detail, and

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[36] This document is available online at http://www.bsee.gov/Regulations-and-Guidance/Notices-to-Lessees/2012/2012-JOINT-G02-pdf.aspx

[37] NMFS' Federal Register of IHA issued to Shell for seismic in Cook Inlet, Alaska, 77 FR 27724 (May 11, 2012), available online at http://www.gpo.gov/fdsys/pkg/FR-2012-05-11/pdf/2012-11296.pdf .

[38] Page 25984 of Federal Register notice available online at http://www.gpo.gov/fdsys/pkg/FR-2012-05-02/pdf/2012-10627.pdf

provides free, public access to PAMGUARD.[39] This site explains why PAMGUARD should be used as a supplement to visual monitoring, and it is worth quoting at some length:

> "The default method for detecting marine mammals at sea is to look for them. Visual observations play a vital role, but marine mammals are difficult to spot on the sea surface, especially when weather and light conditions are poor. In addition…visual techniques are next to impossible at night but often operators wish to continue noise producing activities round the clock….[A]coustic cues can often be detected more reliably at greater ranges and are less affected by weather and sighting conditions and animals can be detected acoustically equally well day and night. Passive Acoustic Monitoring isn't a panacea but for many species it can significantly increase the probability that they are detected and increase the effectiveness of mitigation."
>
> ***
>
> "WHY DID WE NEED PAMGUARD?
>
> Good acoustic monitoring software existed before PAMGUARD but there were a number of reasons that justified developing something new.
>
> In the first place, it was realised that there was a real value in having a single software that marine mammal observers (MMOs) could become familiar with and use on a variety of different vessels. Ideally that software should be freely available, interface to a wide range of hardware configurations and work on many different computer platforms. (Pamguard achieved cross platform compatibility by being written in Java.)
>
> None of the existing programs were open source. This meant that the functioning and performance of the algorithms within them was often not clear and it wasn't possible for a group of users to contribute to and to support it. There was also a long term risk that the software might be withdrawn from use or become outdated.
>
> In most cases there was no commitment to supporting and updating the software and as it wasn't open source it would be difficult for other programmers to provide such support. Some of the software, though excellent, was not designed for real time monitoring by a single operator in field conditions."[40]

PAMGUARD has now undergone beta testing.[41]

BOEM should encourage the use of PAMGUARD by discussing it favorably in the SEIS.

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[39] The industry-sponsored PAMGUARD website is available online at http://www.pamguard.org/home.shtml .

[40] PAMGUARD site available online at http://www.pamguard.org/31_PamguardBackground.html .

[41] Ocean Science Consulting, "Advisors to the New Zealand Government," blog entry dated March 15, 2012, available online at http://www.osc.co.uk/blog/index.php/2012/03/ongoing-beta-testing-of-pamguard/ .

# VI. Conclusion and Recommended Actions

The SEIS should state that current, long-standing regulation has prevented harm from seismic and other oil and gas G & G activities in the OCS.

The SEIS should state that any significantly more stringent regulation of seismic and other oil and gas G & G is unnecessary and could not occur without a new ICR which would have to be reviewed and approved by OMB.

The SEIS should not use AIM to estimate and assess marine mammal exposure and Takes. Any such estimates and assessments should use line transect instead.

The SEIS should require PAM and encourage the use of PAMGUARD.

We thank you for the opportunity to submit these comments. We look forward to further discussing them with the agencies.

Respectfully Submitted,

Jim Tozzi
Member, CRE Board of Advisors