

# OCEAN CONSERVATION RESEARCH



*Science and technology serving the sea*

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August 25, 2014

Re: Aug. 22 BOEM *Science Notes* article “The Science Behind the Decision”

cc: Walter Cruikshank, Sen. Barbara Boxer

Dear Mr. Brown,

BOEM’s most recent edition of *Science Notes* has come across my desk a few times last week, sent to me by colleagues and constituents wanting to get our comments on “The Science Behind the Decision” article. We are being asked because like BOEM, we also believe that “everyone benefits by getting the facts right.” As you have noted this is a complex issue, so there are many facts to get right. Some of the facts you did get right. But there are some facts that you did not include in your open letter to the public and stakeholders, and there are statements of “fact” in the article that are frankly incorrect.

I understand that the Record of Decision does not finalize anything other than the decision to move forward on permitting surveys of the Mid and South Atlantic Outer Continental Shelf areas using (among other technologies) seismic airgun arrays. Nonetheless it is a decision to move forward in a direction that will lead to exploration for hydrocarbon deposits, which will inevitably lead to extraction and exploitation of those deposits.

It is a scientifically undisputed fact that releasing and burning fossil hydrocarbon is pushing our planet into an extreme climate disruption that will impact the habitability of our planet for thousands, and probably millions of years to come. As such, the decision to proceed is not merely a decision to allow marine mammal takes to be considered by NOAA, it is a decision to continue subsidizing (through policy) an industry that is relentlessly killing the planet.

Over →

You cannot dilute BOEM's complicity in this momentum by claiming that the decision is buffered by many more decisions that need to be made by other stakeholders and other agencies before "the final decision" to drill and extract will be made. It is clear that if hydrocarbons are found, industry will push for exploitation. Given how easy it was to arrive at the Atlantic "G&G" Record of Decision, we don't anticipate any significant snags in the regulatory agencies deciding that there will only be "negligible impacts" through the next stages toward full fossil fuel exploitation in the Mid and South Atlantic. It is the bureaucrat's prerogative to pave the way toward disastrous outcomes by "just doing their job." With this Record of Decision BOEM has demonstrated this in spades.

I am not a climatologist, so I don't intend to build on the above arguments; but to paraphrase a wise apothegm "it does not take a climatologist to understand the scope of global climatic disruption." Whatever your field of science it should be clear that lubricating the wheels of climate disruption is anything but wise.

My field is bioacoustics, and I have been engaged in understanding the impacts of human generated noise on marine habitat since 1992 so I will comment on the aspects of your "Science Behind the Decision" article in which I am more conversant.

Unfortunately the BOEM article is incorrect "just out of the gate" with the claim that "To date, there has been no documented scientific evidence of noise from air guns used in geological and geophysical (G&G) seismic activities adversely affecting marine animal populations." In fact there are many published accounts of migratory disruptions,<sup>1,2,3</sup> communication disruptions,<sup>4,5</sup> population displacement<sup>6,7</sup> feeding disruptions,<sup>8</sup> system

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<sup>1</sup> Manuel Castellote, Christopher W. Clark, Marc O. Lammers 2012 "Acoustic and behavioral changes by fin whales (*Balaenoptera physalus*) in response to shipping and airgun noise." *Biological Conservation* 147 (2012) 115–122

<sup>2</sup> Richardson, W.J., G.W. Miller, and C.R. Greene Jr., "Displacement of migrating bowhead whales by sounds from seismic surveys in shallow waters of the Beaufort Sea." *Journal of the Acoustical Society of America* 106:2281 (1999)

<sup>3</sup> Castellote, M. Clark, C.W., Lammers M.O. "Potential negative effects in the reproduction and survival on fin whales (*Balaenoptera physalus*) by shipping and airgun noise." International Whaling Commission report SC/62/E3 - 2010

<sup>4</sup> Di Iorio, L., and C. W. Clark, "Exposure to seismic survey alters blue whale acoustic communication." *Biology Letters*, doi:10.1098/rsbl.2009.0651 (2009)

<sup>5</sup> Blackwell, S.B., et al., "Effects of airgun sounds on bowhead whale calling rates in the Alaskan Beaufort Sea" *Marine Mammal Science*, DOI: 10.1111/mms.12001 (2013)

<sup>6</sup> Parente, C.L., J.P. Araújo, and M.E. Araújo, "Diversity of cetaceans as a tool in monitoring environmental impacts of seismic surveys," *Biota Neotropical*, 7 (1): 49-55 (2007)

<sup>7</sup> Weller, D.W., et al., "Influence of seismic surveys on western gray whales off Sakhalin Island, Russia in 2001." Paper No. SC/54/BRG14 presented to the International Whaling Commission Scientific Committee (2002)

<sup>8</sup> Frances C. Robertson, William R. Koski, Tannis A. Thomas, W. John Richardson, Bernd Würsig, Andrew W. Trites "Seismic operations have variable effects on dive-cycle behavior of bowhead whales in the Beaufort Sea" *Endangered Species Res.* Vol. 21: 143–160, 2013

compromise,<sup>9,10</sup> and even seismic survey associated strandings of marine mammals.<sup>11</sup> Additionally there is evidence of increased metabolic stress due to anthropogenic (shipping) noise that would compromise health and breeding success.<sup>12</sup> There is no reason to believe that seismic survey noise would be any less stressful to marine life.

You have also missed the literature on the impacts of seismic surveys on fisheries and catch rates<sup>13,14</sup> and at least at close range, physiological impacts on fish.<sup>15</sup> And while you do not mention concern for seismic impacts on invertebrates, as they are part of the food chain, any compromise to vitality of squid<sup>16,17</sup> (for example) will certainly impact fisheries as well as compromise the major food stock for many odontocetes. I suspect the lack of more published data of impacts of seismic surveys on fish and fisheries is more due to lack of funding for these studies rather than an absence of harm; nonetheless there is ample anecdotal evidence of fisheries compromise due to seismic surveys. And while these data are not verified by a peer review process, they should be sound enough to call on precaution to protect our fisheries rather than to dismiss the accounts for expediency sake.

I could continue with at least two decades of published, peer reviewed papers on seismic impacts to marine mammals, fish, and invertebrates but I believe I have made the point that contrary to the statement in the article that “there has been no documented scientific evidence of noise from air guns used in geological and geophysical (G&G) seismic activities adversely affecting marine animal populations or coastal communities, there is actually no lack of evidence of observable negative impacts of seismic surveys on marine life.

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<sup>9</sup> Gray, H. and K. Van Waerebeek, “Postural instability and akinesia in a pantropical spotted dolphin, *Stenella attenuata*, in proximity to operating airguns of a geophysical seismic vessel.” *Journal for Nature Conservation*; 19:363-367.(2011)

<sup>10</sup> Mann, D., et al., “Hearing loss in stranded odontocete dolphins and whales.” *PLoS ONE*, 5(11): (2010).

<sup>11</sup> Hildebrand, J.A., “Impacts of anthropogenic sound” in *Marine mammal research: conservation beyond crisis*. The Johns Hopkins University Press, Baltimore, Maryland, pp. 101-124 (2005)

<sup>12</sup> Rosalind M. Rolland, Susan E. Parks, Kathleen E. Hunt, Manuel Castellote, Peter J. Corkeron, Douglas P. Nowacek, Samuel K. Wasser and Scott D. Kraus. 2012 “Evidence that ship noise increases stress in right whales” *Proc. R. Soc. B*

<sup>13</sup> Engås, A. S. Løkkeborg, E. Ona, and A.V. Soldal. 1996.” Effects of seismic shooting on local abundance and catch rates of cod (*Gadus morhua*) and haddock (*Melanogrammus aeglefinus*)”. *Can. J. Fish. Aquat. Sci.* 53:2238-2249.

<sup>14</sup> Løkkeborg, S. and A.V. Soldal. 1993. The influence of seismic exploration with airguns on cod (*Gadus morhua*) behaviour and catch rates. *ICES mar. Sci. Symp.*, 196:62-67.

<sup>15</sup> McCauley, R. D., Fewtrell, J. & Popper, A. N. (2003). “High intensity anthropogenic sound damages fish ears.” *Journal of the Acoustical Society of America* 113, 638–642

<sup>16</sup> Michel André, Marta Solé, Marc Lenoir, Mercè Durfort, Carme Quero, Alex Mas, Antoni Lombarte, Mike van der Schaar, Manel López-Bejar, Maria Morell, Serge Zaugg, and Ludwig Houégnigan (2011) “Low-frequency sounds induce acoustic trauma in cephalopods” *Front Ecol. Environ.* 2011; doi:10.1890/100124

<sup>17</sup> A. Guerra, A.F. González and F. Rocha (2004) “A review of the records of giant squid in the north-eastern Atlantic and severe injuries in *Architeuthis dux* stranded after acoustic explorations” *International Council for the Exploration of the Sea* CC:29

While some of the clarifications on the metrics of noise intensity, and the term “take” are somewhat helpful, having begun the article with such a vast oversight and omissions does little to burnish your claim of “getting the facts right.” This is punctuated by the muddy explanation on sound intensity in air and water that includes the speed of sound as a variable. The speed of sound would have something to do with how animals perceive sound in air or water, but it has absolutely nothing to do with sound intensity.

Additionally dismissing what are known as “level B takes” as being “negligible” suffers from a reductionist view of the significance of behavioral impacts. “Level B Takes” are defined as an indicator of a mitigation threshold for a reason. The “seal jumping off the rock” avoidance behavior may sound “negligible,” but any animal enduring continuous elevated “level B” impacts will have a compromised natural history.

What I find exceptionally annoying about this entire gambit is that by missing the marks on these facts BOEM has demonstrated that the February 2014 public comment period for the Atlantic G&G PEIS was merely a bureaucratic exercise. It is an insult to the public and the many conservation organizations that spent considerable time and energy reviewing and commenting on the PEIS, which clearly BOEM did not take the time to review. This belies the comment in the article that BOEM conducted a “thorough public process.” Granted there was a consideration by BOEM of the 2012 Draft EIS public comments, but the agency failed in the issuance of the 2014 PEIS for public review as it is clear that the decision had already been made without consideration for public input - in violation of the National Environmental Policy Act.

I have enclosed our comments on the 2014 Atlantic G&G PEIS for you should you really be interested in “getting the facts right.”

Sincerely,

A handwritten signature in black ink that reads "Michael Stocker". The signature is written in a cursive, flowing style with a long horizontal stroke at the end.

Michael Stocker  
Director