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Interactive comment on "Seafloor observations at Campeche Knolls, southern Gulf of Mexico: coexistence of asphalt deposits, oil seepage, and gas venting" *by* Heiko Sahling et al.

D. Orange

dan@seaseep.com

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Attached you will hopefully find a document with the text and figures commented upon, with a few minor corrections.

A few general / high-level comments:

See comment on page 5: We suggest adding a sentence to clarify what the authors mean by "flares", "plumes" and water column anomalies. Something like, "In this paper we assume that all acoustic flares are related to gas seepage and we will refer to them as "gas bubble flares", "flares" or "plumes"

Page 6: please explain whether the "flare" picks are the lowest actual pick you could

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make in the water column, whether it's the projected seafloor point of origination using the angle of the identified flare in the water column, or if it is vertically below the deepest identified flare point.

Page 11: Discussion. Did you study any regions without SAR slicks? If not, then you've established a correlation between SAR slicks and seafloor seepage, but the converse – whether there's seepage in the absence of SAR slicks – has not been shown. This is the "evidence of absence" that philosophers refer to. The authors should sate this clearly. By studying only areas with SAR slicks, there is a sample bias. This isn't a serious issue, but it does need to be stated.

Page 17: If the 11 SAR sites studied all had evidence of seepage, and there are over 50 SAR sites. . .how unique is the ecosystem? Each of the knolls studied cover on the order of 50 sq. km. or more. The very small detailed areas on each knoll showed evidence of seepage. Could this evidence of seepage extend over a large area of each knoll? On a worldwide basis, this type of ecosystem is rare, but in the Campeche area is it possible that it is not – that it is actually common?

Page 17 – 18: the authors need to significantly expand their discussion of the oil industry and potential impacts on seep communities. Specifically, since the first cold seep communities were discovered in 1985 (including the Gulf of Mexico), the recognition of seep communities in an area of active exploration and development lead to a series of "notices to lessses" regarding how to avoid biologically sensitive areas. See NTL 2009-G40 (link: http://www.boem.gov/Regulations/Notices-To-Lessees/2009/09-G40.aspx). The NTL provided guidance on how to develop in an area of potential seep communities (and deepwater corals). Geohazard interpreters have gain experience interpreting potential seep locations based upon geophysical data, and these geohazard surveys are a routine part of exploration in the northern Gulf of Mexico. The authors' work will in fact help provide a foundation for where such communities are found in the southern Gulf of Mexico, and a basis for an approach similar to BOEM's might be applied to the Mexican Gulf of Mexico.

As the authors will see on the bottom of page 18, we suggest they consider the addition of a sentence such as “We call for the impact on these ecosystems to be considered as part of any future development in the Campeche Knolls area.”

I strongly recommend publication with minor modification.

Respectfully submitted, -Dan Orange ONE / U.C. Santa Cruz

Please also note the supplement to this comment:
http://www.biogeosciences-discuss.net/bg-2016-101/bg-2016-101-SC3-supplement.pdf

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