Appendix

Template for Submission of Scientific Information

to Describe Ecologically or Biologically Significant Marine Areas

*Note: Please **DO NOT** embed tables, graphs, figures, photos, or other artwork within the text manuscript, but please send these as separate files. Captions for figures should be included at the end of the text file, however.*

Title/Name of the area:

"49° 39' vent field", SW Indian Ridge

Presented by (*names, affiliations, title, contact details)*

Dr Jon Copley, University of Southampton, UK; tel +44 23 8059 6621, email jtc@soton.ac.uk

Abstract (*in less than 150 words)*

The "49° 39' vent field" is one of the first deep-sea hydrothermal vent fields to be surveyed and sampled so far on the ultraslow-spreading SW Indian Ocean. Water column signals indicative of seafloor hydrothermal activity in the area were detected by hydrographic survey in the 1997 (German et al., 1998, Nature, 395: 460-463), and the seafloor source of those signals was visually confirmed by an AUV survey in 2007 (Tao et al., 2012). The first survey and sampling of the vent field by a human-directed vehicle was undertaken in November 2011, during dives by the Kiel6000 ROV (remotely-operated vehicle). These ROV dives reveal a biological community that is to date unique in vent ecology, containing new animal species and new combinations of known species, in an area where seafloor mineral exploration is expected.

Introduction

(To include: feature type(s) presented, geographic description, depth range, oceanography, general information data reported, availability of models)

Active hydrothermal vent field, located on the western flank of a north-south trending topographic adjacent to the non-transform offset between Segments 28 and 29 of the Southwest Indian Ridge. The site consists of a "field" of sulfide edifices ("chimneys" and similar features, exceeding 25 m in height in some cases), concentrated in an area covering approximately 800 m by 500 m (although exact extent may not be fully known) at depths between 2700-2800 m. A map of the distribution of known sulfide edifices within the vent field is currently being compiled from ROV dive data and will be available shortly.

Location

(Indicate the geographic location of the area/feature. This should include a location map. It should state if the area is within or outside national jurisdiction, or straddling both. It should also state if the area is wholly or partly in an area that is subject to a submission to the Commission on the Limits of the Continental Shelf)

The "49° 39' vent field" extends approximately between 49° 38.7' E to 49° 39.0' E and 37° 46.7' S to 37° 47.1' S. Its location lies exclusively with The Area and is not subject to any national jurisdiction or any extended continental shelf submission.

Feature description of the proposed area

Please note that this template is provided to facilitate information submission on a voluntary basis, only when the information provider finds this template appropriate. If the available information does not fit the format of this template, information can be submitted in another format, in consultation with the Secretariat.

(This should include information about the characteristics of the feature to be proposed, e.g. in terms of physical description (water column feature, benthic feature, or both), biological communities, role in ecosystem function, and then refer to the data/information that is available to support the proposal and whether models are available in the absence of data. This needs to be supported where possible with maps, models, reference to analysis, or the level of research in the area)

Benthic feature: "field" of sulfide edifices, some >25 m high, concentrated in an area currently estimated to be 800 x 500 m. Several sulfide edifices are active "black smoker" high-temperature hydrothermal vents; area also contains relict sulfide structures, and areas of lower-temperature, diffuse hydrothermal flow. The vent field hosts a biological community comprised of a mixture of new animal species, species known from vent fields of the Central Indian Ridge, and species known from newly-discovered vent fields on the East Scotia Ridge in the Southern Ocean. Species present that are known from other vent fields occur here in contrasting abundance to their occurrence in other regions. Overall, the biological community of the Dragon Vent Field is therefore unique to date in vent ecology.

Feature condition and future outlook of the proposed area

(Description of the current condition of the area – is this static, declining, improving, what are the particular vulnerabilities? Any planned research/programmes/investigations?)

The dynamics of this to-date unique hydrothermal vent community are at present unknown. The size of sulfide edifices in the vent field suggests a prolonged history of hydrothermal activity at the site. Longevity of activity is also predicted at this site on an ultraslow-spreading ridge from the relationship seen between longevity of activity and ridge spreading rate. The first remotely-operated vehicle dives at the site, in November 2011, undertook videographic surveys of the distribution of fauna on sulfide edifices to establish a baseline for future studies of temporal change, to elucidate the ecological dynamics of a vent community on an ultraslow-spreading ridge for the first time. The vent field, however, occurs within an area licensed to COMRA by the ISA (in July 2011, prior to the first ROV dives at the site) for seafloor mineral exploration.

Please note that this template is provided to facilitate information submission on a voluntary basis, only when the information provider finds this template appropriate. If the available information does not fit the format of this template, information can be submitted in another format, in consultation with the Secretariat.

Assessment of the area against CBD EBSA Criteria

(Discuss the area in relation to each of the CBD criteria and relate the best available science. Note that a candidate EBSA may qualify on the basis of one or more of the criteria, and that the boundaries of the EBSA need not be defined with exact precision. And modeling may be used to estimate the presence of EBSA attributes. Please note where there are significant information gaps)

CBD EBSA Criteria (Annex I to decision IX/20)	**Description** (Annex I to decision IX/20)	**Ranking of criterion relevance** (please mark one column with an X)			
		Don't Know	**Low**	**Some**	**High**
Uniqueness or rarity	Area contains either (i) unique ("the only one of its kind"), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features.				**X**
Explanation for ranking ***Initial analysis of the biological community indicates a new cryptic species of* Kiwa *crab (3% COI gene sequence divergence from a morphologically similar species from the Southern Ocean). At present, the 49° 39' vent field is the only recorded occurrence for this apparent new species. Further analyses of faunal samples collected in November 2011 (currently underway) may also reveal additional new species. In addition, the community at the vent field is unique in its overall composition, with the first co-occurrence of some species known from the Central Indian Ridge and some species known from the East Scotia Ridge, at abundances that contrast with their occurrence in those locations. The large size of the sulfide edifices at the vent field is also unusual (and may be a consequence of longevity of activity at this site on an ultraslow-spreading ridge).***					
Special importance for life-history stages of species	Areas that are required for a population to survive and thrive.	**X**			
Explanation for ranking ***Water column signals indicate the presence of other active vent fields along the SW Indian Ridge (German CR* et al., *1998,* Nature, *395: 490-493), and other active vent sites have now been visually confirmed on the SW Indian Ridge (Tao* et al., *2009, AGU Fall Meeting Abstract #OS21A-1150). But levels of gene flow and population connectivity among any species shared between sites in this region have yet to be established, and therefore the necessity of this particular site for persistence of regional metapopulations of its species is not known.***					
Importance for threatened, endangered or declining	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.	**X**			

Please note that this template is provided to facilitate information submission on a voluntary basis, only when the information provider finds this template appropriate. If the available information does not fit the format of this template, information can be submitted in another format, in consultation with the Secretariat.

species and/or habitats					
Explanation for ranking ***The dynamics of this unique community on an ultraslow-spreading ridge are not yet known; nor is the susceptibility known for these vent species to anthropogenic impacts and disturbances posed by seafloor mineral exploration activities.***					
Vulnerability, fragility, sensitivity, or slow recovery	Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.	**X**			
Explanation for ranking ***Although the rate of natural disturbance at the level of an individual sulfide edifice within a vent field is may be high at hydrothermal vents, at vent-field scale there is long-term stability in ecological structure at vent fields on slow-spreading ridges (e.g. Copley* et al.*, 2007,* J Mar Biol Assoc UK, *84: 859-867), and their susceptibility to degradation or depletion is therefore unknown.***					
Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.				**X**
Explanation for ranking ***As a result of local chemosynthetic primary production at the vent field, the abundance and biomass of biota at the site are orders of magnitude greater than the surrounding areas of seafloor.***					
Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.	**X**			
Explanation for ranking ***As this is the first vent field to be surveyed and sampled by ROV dives on the SW Indian Ridge, the regional context of its diversity of habitats and the genetic diversity of its populations are as-yet unknown.***					
Naturalness	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.				**X**
Explanation for ranking ***Until the surveys in 2007 and 2011, this benthic site had never been visited by human technology. At present it can therefore be consider "pristine".***					

Please note that this template is provided to facilitate information submission on a voluntary basis, only when the information provider finds this template appropriate. If the available information does not fit the format of this template, information can be submitted in another format, in consultation with the Secretariat.

Sharing experiences and information applying other criteria (Optional)

Other Criteria	**Description**	**Ranking of criterion relevance** (please mark one column with an X)			
		Don't Know	**Low**	**Some**	**High**
Add relevant criteria					
Explanation for ranking					

References

(e.g. relevant documents and publications, including URL where available; relevant data sets, including where these are located; information pertaining to relevant audio/visual material, video, models, etc.)

Tao C *et al.* (2012). First active hydrothermal vents on an ultraslow-spreading center: Southwest Indian Ridge. *Geology*, 40: 47-50.

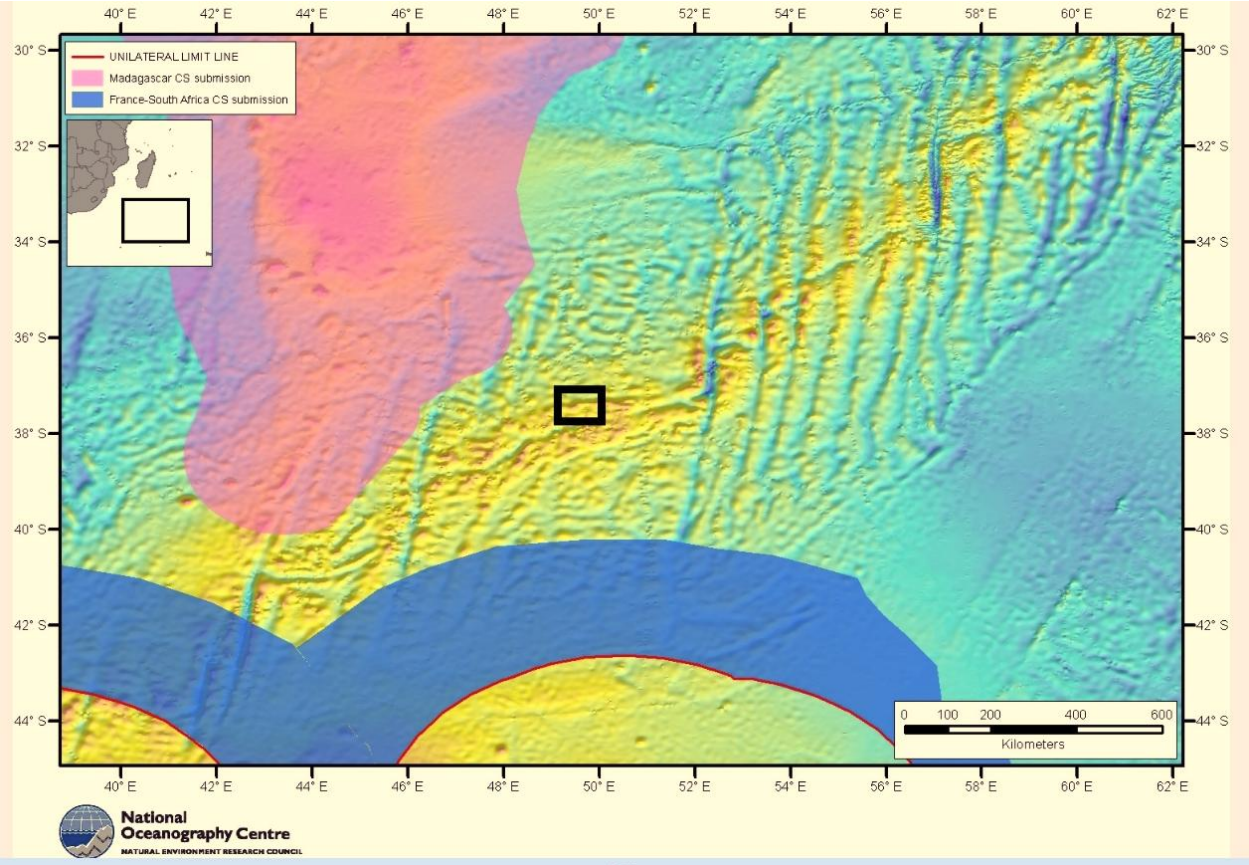
Copley JT *et al.* (in prep), *RRS James Cook Research Cruise 67 Report* (shortly to be available via the British Oceanographic Data Centre, along with all research cruise data from November 2011, once data are fully processed for archiving).

Maps and Figures

Please see Fig 3B in Tao et al. (2012); the location and extent of the active vent area spans the "S zone" and "M zone" marked on that map.

[I do not have permission to reproduce that figure; and our own data from ROV dives during RRS James Cook Voyage 67 in November 2011 are still being processed]

Please note that this template is provided to facilitate information submission on a voluntary basis, only when the information provider finds this template appropriate. If the available information does not fit the format of this template, information can be submitted in another format, in consultation with the Secretariat.



Rights and permissions

(Indicate if there are any known issues with giving permission to share or publish these data and what any conditions of publication might be; provide contact details for a contact person for this issue)

All results reported here from November 2011 ROV dives (e.g. initial COI divergence data for *Kiwa* crabs; taxonomic composition of the vent community; extent and nature of active sulfide edifices at the site) have yet to be submitted in a peer-reviewed publication and should therefore not be made public until published in that manner. Submission and publication are anticipated by the end of 2012.