

## Joint Industry Programme on E&P Sound and Marine Life - Phase III

Request for Pre-Proposals Number: JIP III-18-01

### UNDERSTANDING MARINE MAMMAL AND/OR FISH AUDITORY MASKING

Release Date: 3 January 2018

#### Introduction

This Request for Pre-Proposals (RFP) seeks proposals for independent studies to advance understanding of auditory masking in marine mammals and/or fish. It is understood that underwater sound can interfere with the way in which marine mammals and fish receive and process acoustic signals for communication, navigation, and important behaviours, including social interaction and foraging. Auditory masking in marine mammals and fish is still poorly understood and there is an increasing concern from regulators and stakeholders about auditory masking resulting from anthropogenic underwater sound. Robust, science based information on masking will help to inform industry understanding and risk assessment processes, refine current acoustic and regulatory models, and prevent future regulations being based upon little to no data and/or poorly informed decisions.

This RFP seeks proposals that help advance knowledge of auditory masking, particularly the physical acoustic and/or biological processing aspects of auditory masking in marine mammals and/or fish with respect to E&P sounds sources, with a particular emphasis towards airgun, marine vibroseis and/or vessel sources. The JIP commissioned a review paper by Christine Erbe and co-researchers on the understanding and mechanisms of masking in marine mammals (Erbe *et al.*, 2016, Communication masking in marine mammals: a review and research strategy) - see JIP Library Database accessible via link on <http://www.soundandmarinelife.org/library.aspx>. This RFP will advance work on the identified key recommendations and research framework in Erbe *et al.* (2016) (see *Background and JIP Priority Areas below*). This topic area falls under the JIP's Research Category 3 *Behavioural Reactions and Biological Significance*, see [www.soundandmarinelife.org](http://www.soundandmarinelife.org).

Initially, applicants are requested to submit a Pre-Proposal (**no more than 4 pages; full instructions below in Section *Desirable Features of Pre-Proposals***). The pre-proposal should describe the rationale & nature of the work proposed, the approach to addressing one or more of the six priorities of masking outlined below and/or in Erbe *et al.* (2016) and also should include a proposed budget and timeline. We encourage researchers to focus on one aspect of masking (either physical or biological). After review and feedback from the JIP, short-listed applicants will be requested to submit a full proposal. Guidelines for the full proposal will be included in the notification to applicants.

Organisations submitting proposals should also adhere to the Application Procedure and Critical Dates set out below. In addition, the Terms & Conditions referred to in the RFP shall apply.

#### Application Procedure

To respond to this RFP, please follow the relevant instructions given on the **Funding** page of the JIP website. Proposals should refer to the above RFP number and be submitted electronically to [info@soundandmarinelife.org](mailto:info@soundandmarinelife.org).

Those organisations submitting Proposals should refer to the **outline contract** on the JIP website. This sets out the terms & conditions under which any contract will be carried out under the management of the International Association of Oil & Gas Producers (IOGP). In particular, attention is drawn to the

specific term relating to management of health, safety, security and environment aspects of a contract. All IOGP contracts have such a section, but the specific wording that will appear in this section depends on the type of activity (desk-top study, field work, etc.) to be conducted.

### **Critical Dates**

<b>3 January 2018</b>	<b>Release of RFP</b>
<b>9 February 2018</b>	<b>Deadline for Pre-Proposals to be received at <a href="mailto:info@soundandmarinelife.org">info@soundandmarinelife.org</a> (Midnight GMT, 9 February 2018)</b>
<b>23 February 2018</b>	<b>Notification of Pre-Proposal applicants selected for Full Proposal submissions, including guidelines for the Full Proposal (<i>Pre-proposal applicants not selected for full proposal submission will be informed by IOGP</i>).</b>

*Indicative subsequent time-table (subject to quality & volume of Pre-Proposals received)*

<b>** March 2018</b>	<b>Deadline for submission of Full Proposals</b>
<b>** April 2018</b>	<b>Full proposal applicants notified of <u>possible</u> JIP requests for additional information</b>
<b>** May 2018</b>	<b>Notification of award decisions and contract negotiations</b>
<b>** June 2018</b>	<b>Anticipated start date for award(s)</b>

*\*\* Exact dates will be notified by IOGP to short-listed Applicants upon completion of Pre-Proposals evaluation process. IOGP reserves the right to amend or extend the time-table for full Proposals.*

We will confirm receipt of proposals. If you have not received confirmation of receipt of your proposal within 1 week of the above deadline, please contact John Campbell at IOGP (Tel +44 (0) 20 3763 9707; e-mail [info@soundandmarinelife.org](mailto:info@soundandmarinelife.org)).

### **Background**

Masking is the process by which the ability to detect a sound signal is degraded by the presence of background or other sound - natural or anthropogenic. Sound-generating activities, like seismic surveys, shipping, or marine construction have the potential to mask sounds of interest to marine animals. Source characteristics (i.e. amplitude, peak or dominant frequency, duty cycle, etc.) are not sufficient by themselves to predict the potential masking effects on marine life. Additional information, such as the spectral characteristics of both the signal of interest and background sound at the receiver's location, the perceptual limits of the listener's auditory system, and complex features of auditory processing by the afferent and efferent nervous system, are needed to fully predict the likelihood of auditory masking by a given masking sound source. Complex features of masking sound created by E&P sounds sources, specifically airgun, marine vibroseis, and/or vessel sources, will need to be identified and then be tested and integrated accurately and consistently in models, decision tools and impact assessments. It will also be necessary to demonstrate in the proposal a reasonable understanding of anti-masking mechanisms, such as comodulation release from masking or spatial release from masking; mechanisms that reduce the degree of masking experienced by marine life. The pre-proposal should also reflect understanding of commonly known signal properties that reduce the risk of masking, such as signal redundancy and changes to signal amplitude or frequency structure.

### **JIP Priority Areas**

The JIP has identified six high priority areas of importance, in no particular order, selected as starting points towards progressing our understanding and/or refining models to adequately address masking and its effects on marine mammals.

1. Test for, and assess degree of, spatial release from masking.
2. Test and assess how signal levels relative to background sound levels or ‘signal-to-noise’ ratio affects masking, especially for pulses.
3. New or improved hearing data for marine mammals or fish related to understanding impacts related to masking. For instance, measure masking at the low frequencies used by mysticetes, possibly using seals as surrogates because they hear at lower frequencies than other non-mysticete hearing groups (e.g. dolphins and porpoises).
4. Conduct a field study to measure marine mammal or fish communication ranges under different masking scenarios.
5. Conduct behavioural studies to determine how variations in both signal and background sound levels affect detection thresholds in terms of masking.
6. Refinement of existing or newer auditory masking models by integrating new and realistic data (i.e. metrics, releases from masking, communication ranges).

For each of these priorities, there can be a variety of approaches to progressing our understanding of either biological or physical aspects of masking. We encourage proposals in one or more of the above priorities. The JIP is aware of the broad nature of this RFP, and it is also understood that better understanding of the spectral and temporal characteristics of sound as it propagates underwater is necessary since information of sound source characteristics is not sufficient in predicting masking effects. Therefore, the JIP will entertain proposals outside of these six priorities if the proposed work aligns with the Erbe *et al.* (2016) recommendations and the proposers can clearly justify how the proposed work will advance the marine sound community’s understanding of masking and its effects in marine mammals and/or fish.

Results from the proposed research shall:

- a) advance progress in the masking priorities identified above and by Erbe *et al.* 2016
- b) investigate the likelihood of creating masking under certain scenarios relevant to industry E&P operations (particularly airgun and/or marine vibroseis surveys and/or vessel activities)

### **General Points (applicable to Pre-Proposals)**

Applicants are asked to consider the following general points in their applications:

- Pre-proposals should demonstrate the applicant’s in-depth knowledge of masking.
- Pre-proposals should advance one or more of the six E&P priorities identified above and the research recommendations of the above-referenced desk-top study review by Erbe *et al.* 2016. The JIP expects pre-proposals in response to this call to build on Erbe *et al.* 2016 rather than to restate or repeat it.
- Applicants can either select to emphasize biological, physical, or both aspects of masking. The JIP is open to pre-proposals with a focus on data reanalysis and model or on field work, depending how such data re-analysis meets the objectives of this RFP.
- Applicants can either select to emphasize marine mammals or fish or both. Applicants can also either select to emphasize a single operational sound source or a combination of sources. The JIP is

primarily interested in better understanding masking related to seismic surveys, marine vibroseis, or vessel activities, but will consider pre-proposals emphasizing other E&P sources.

- Applicants shall describe how the research will build upon existing work funded by the JIP, improve existing acoustic models, generate new data, or clearly show how data and models link together to demonstrate effects of masking.
- Preference will be given to proposals that will lead to project completion within 12 - 24 months of contract award. Projects longer than 24 months may be considered, but projects longer than 36 months will not be contemplated. The JIP encourages that the exact scope of work is consistent with the scope of the task description, indicative time-scale, and the planned program budget.
- The total budget for this RFP is \$500K USD and multiple projects may be funded.

### Desirable Features of Pre-Proposals

The pre-proposal should address each of the following:

- a) A title, primary investigator with contact information, and responsible institution.
- b) An overall proposal summary, including mention of which JIP (or Erbe *et al.* 2016) priorities of masking will be addressed.
- c) A clear and concise summary of project methodology, including sources of data, source parameters, or other information that is necessary and/or may need to be acquired
- d) A summarized work plan with clearly stated deliverables (reports, publications, software, etc).
- e) Estimated timeline for completion of project & significant milestone events during the project.
- f) Summary of cost estimate in US dollars (not exceeding \$500,000 USD)
- g) A list of personnel to be involved in the project and their proposed role in this project. Short biographies for personnel should also be included. Note that curriculum vitae or resumes for personnel will be required in the full proposal stage. The list and bios **will not** count against the pre-proposal page limit of no more than 4 pages.
- h) Formatting of the pre-proposal should be 8.5 \* 11 inch page size with no less than 1-inch margins and 10-point type. List of works cited and CVs/resumes should be annexed.

Instructions and requirements for full proposals and project deliverables will be provided to proposers invited to submit a full proposal. General requirements for full proposals can be found on the **RFP Response Format** section of the **Funding** page of JIP website.

### Terms & Conditions

By submitting a proposal to the JIP, the potential contractor accepts the terms and conditions set out in this RFP. This RFP does not commit the JIP, through IOGP, to contract for any supply or service and the JIP shall not be deemed to have accepted any proposal submitted by any potential contractor unless and until a duly executed written agreement is in place and then only for such scope as specifically identified in the written agreement.

The potential contractor acknowledges that IOGP and the JIP participants may accept or reject any proposal for any reason whatsoever. The JIP may decide to fund a study in part or as a whole. The JIP will not enter into discussion on its decision on any award made as a result of this RFP.

Those responding to this RFP are advised that the JIP will not pay for any costs incurred in preparation of a response to this invitation, including without limitation costs and expenses of attending meetings and worksite visits related to this RFP. All correspondence and documentation associated with this invitation will be in English. Submissions and information will not be shared with other potential contractors.