Competitive Science Research Fund (CSRF) **Letter of Intent**

This form is to be used to submit a Letter of Intent (LOI) to seek funding from the CSRF.

ALL sections must be completed, except where noted “if applicable”.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1. Research Area:** | | Stock assessment science | | | | | | | | |
| **2. Research Focus:** | | Ecosystem Approach to Fisheries Management | | | | | | | | |
| **3. Research Priority:** | | Incorporation of Environmental Variables into Stock Assessment and Science Advice: Developing and testing analytical approaches to facilitate the incorporation of environmental variables, i.e., climate, oceanographic and ecosystem factors, into stock assessment and science advice, including impacts on subsequent decision making. | | | | | | | | **4. PIN** |
| FS-22-01 |
| **5. Project Identification** | | | | | | | | | | |
| **5.1 Project Title:** | | EcoTest: Robust Fishery Management Advice for Changing Ecosystems | | | | | | | | |
| **5.2 Amount of requested funding** - Enter total funding requested for the project [last cell of section 11.4] | | | | | | | | | $180,000 | |
| **5.3 Duration of requested funding** | | | | | | | | | 3 years | |
| **5.4** If the project will take longer than 3 years, specify the expected total duration (if applicable) | | | | | | | | |  | |
| **5.5 Principal Investigator (PI)** | | Name: Yanjun Wang  Email: Yanjun.Wang@dfo-mpo.gc.ca | | | **Lead Region:** | Maritimes | | | | |
| **5.6 Co-PI:**  (if applicable) | |  | | | **Co-PI Region:**  (if applicable) |  | | | | |
| **6. Research team** (list all key collaborators/partners, provide % of identified FTE time going towards project)**:** | | | | | | | | | | |
| **Name** | | **Role in the project**  (estimated % FTE time, and key expertise) | | | **Region**  (enter ‘external’ if not from DFO) | If partner / collaborator is external, identify the institution: | | | | |
| Yanjun Wang | | Project co-lead, 25%FTE | | | Maritimes |  | | | | |
| Dr Thomas Carruthers | | Project co-lead / supervisor (25% FTE) | | | External | Blue Matter Science Ltd. | | | | |
| A post-doctoral researcher | | Lead analyst (50% FTE) | | | External | Blue Matter Science Ltd. | | | | |
| Monica Finely | | Provide data and feedback, 5%FTE | | | Maritimes |  | | | | |
| Caira Clark | | Provide data and feedback, 5%FTE | | | Maritimes |  | | | | |
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| **7. Client Engagement** – Identify the client colleague with whom you are discussing this proposal (Name and client sector, region) and briefly explain discussions had to date (number of conversations, nature of discussion [ex/ agreement on deliverables, clarification of research question, etc.]) **(100 words max).** | | | | | | | | | | |
| **Client Name(s) and client sector** | | Kathy Cooper-McDonald/ Resource Management;  Penny Doherty/ Resource Management | | | **Region** | Maritimes Region | | | | |
| Brief explanation of discussions:  In this proposed project, 5Zjm haddock, 4X cod and haddock are the 3 case studies, the EBFM impact on fish stock dynamics management decisions will be incorporated and tested. I had discussion by emails with Penny Doherty, who is the 4X5Y groundfish resource manager and Kathy Cooper-McDonald who is Georges Bank resource manager and TMGC member. They both think this is an important work with potential impact on management decisions. They would be happy to provide resource management perspective requirement and suggestions. | | | | | | | | | | |
| **8. Project Summary** – Clearly (i) describe how the project specifically addresses the priority; (ii) List the primary objective(s) of the project; and (iii) outline the methods to be applied to achieve those objectives **(300 words max).** | | | | | | | | | | |
| DFO’s Sustainable Fisheries Framework provides a foundation for implementing ecosystem based fisheries management (EBFM) that can account for interactions among species and their environment (DFO 2017, GOC 2017).  A principal obstacle is the development of ecosystem models that can pass requirements of peer-review. Nonetheless, there is a critical need to establish tactical advice for fisheries managers that is robust and ecosystem-responsive in order to make progress towards the essential goals of EBFM.  In fisheries management a framework already exists and is widely used to obtain rigorous tactical advice given uncertain system dynamics. Management Strategy Evaluation (MSE) is a simulation approach that identifies management strategies that can meet objectives given uncertain dynamics which can also be used as a testbed for evaluating approaches for providing fishery tactical advice (such as stock assessments, reference points, harvest control rules etc). Crucially it can formally account for system hypotheses that cannot necessarily pass conventional standards of peer-review (Figure 1).    Figure 1. EcoTest: testing and development of ecosystem-ready management strategies.    An opportunity exists to extend openMSE1, to allow for a wide range of ecosystem effects, allowing for a comprehensive test of existing and new stock assessments, harvest control rules and management procedures. Where plausible ecosystem dynamics provide challenges across a range of management strategies, indicator systems will be investigated that can operate as a caution against proceeding with current management strategies.  This project seeks to directly address objectives of previous DFO working groups (e.g. DFO 2017):   1. Build expertise in EBFM 2. Evaluate existing management practices with respect to an EBFM. 3. Identify opportunities to incorporate EBFM. 4. Identify data gaps for ecosystem responsive management 5. Develop a plan to make progress with EBFM.   The project would focus on three case studies in the Maritimes region:   1. **5Zjm Haddock**: the ecosystem perspective that could be addressed are density-dependent mortality, growth changes and recruitment regime shift 2. **4X5Y Cod:** the ecosystem perspective that could be addressed are predator-prey(cod-seal) and recruitment shift(depensation) 3. **4X5Y haddock:** the ecosystem perspective that could be addressed are growth changes and time-varying mortality on older age groups.   1 DLMtool and MSEtool that were previously supported by DFO’s Ocean and Freshwater Science Contribution Program, MECTS-#3688308, MECTS-#3802462, MECTS-#4171361).  DFO. 2017. Maritimes Region Workshop Report: Incorporating an Ecosystem Approach into Science Advice for Fisheries (April 3 to 7 2017). Available at: <https://waves-vagues.dfo-mpo.gc.ca/Library/40636914.pdf>  GOC. 2017. Minister of Fisheries, Oceans and the Canadian Coast Guard Mandate Letter. Available at: <https://pm.gc.ca/en/mandate-letters/2019/12/13/archived-minister-fisheries-oceans-and-canadian-coast-guard-mandate>  Hordyk, H., Huynh, Q., Carruthers, T. 2021. openMSE: an R package is designed for building operating models, doing simulation modelling and management strategy evaluation for fisheries. Available at: [www.openmse.com](file:///C:\Users\GreenlawM\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\9KJU08YV\www.openmse.com) | | | | | | | | | | |
| **9. Deliverables / Project Outputs –** Clearly (i) describe the expected deliverables (be sure to include the mandatory ***final report*** on the results/outcomes for clients); and (ii) explain their relevance/usefulness to clients **(250 words max).** | | | | | | | | | | |
| 1. A comprehensive set of operating models for each case study that encompass plausible ecosystem effects including those relating to ecosystem and climate change. 2. A test of a range of existing and novel management strategies that are responsive to ecosystem changes identifying those that can meet management objectives. 3. A value of information analysis to identify data streams that can help support ecosystem-ready management strategies. 4. Identification of suitable reference points that reflect management performance given ecosystem-effects. 5. Training and materials to support DFO capacity building in MSE, assessment and EBFM 6. A draft peer-reviewed paper on the results highlighting novel management strategies and recommendations for EBFM. 7. A final report presented at a regional CSAS meeting | | | | | | | | | | |
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| **10. Data Management Plan** – Identify the SDM-SC data manager for your region and the expected data steward for the life of the project and afterward | | | | | | | | | | |
| **10.1 SDM-SC data manager in your region:** | | | |  | | | | | | |
| **10.2 Data Steward for the project:** | | | |  | | | | | | |
|  | | | | | | | | | | |
| **11. Budget** – Outline funding requested from the CSRF for the applicable years. Use the ‘Budget Spreadsheet’ template on the CSRF website to assist with these calculations. *\*\*****Round to the nearest dollar.*** | | | | | | | | | | |
| **11.1 Salary requested** | **Year 1** | | **Year 2** | | **Year 3** | | | **Salary Total** | | |
|  |  | |  | |  | | |  | | |
| **Outline salary costs**  Briefly identify what salary funding will be used for | | | | | | | | | | |
| Year 1 | | | | | | | | | | |
| Year 2 | | | | | | | | | | |
| Year 3 | | | | | | | | | | |
| **11.2 O&M requested** | **Year 1** | | **Year 2** | | **Year 3** | | | **O&M Total** | | |
|  | $60,000 | | $60,000 | | $60,000 | | | $180,000 | | |
| **Outline O&M costs**  Briefly identify what O&M funding will be used for. Ex./ contract(s), equipment, publishing, etc. | | | | | | | | | | |
| Year 1   * Service Contract to pay 50% FTE for the lead analyst (post doctoral researcher. $30,000) and 25% FTE for the technical supervisor (Tom Carruthers, $30,000) | | | | | | | | | | |
| Year 2   * As year 1 | | | | | | | | | | |
| Year 3   * As year 2. | | | | | | | | | | |
| **11.4 Total Funding Requested –** Sum of Salary and O&M Totals | | | | | | | | $180,000 | | |
| **11.5 Other sources of funding** - Identify possible other sources of funding (program or institution), type (cash/in kind) and amount of additional funding/support you would need (if applicable). | | | | | | | | | | |
| 1. | | | | | | | | $ | | |
| 2. | | | | | | | | $ | | |
| 3. | | | | | | | | $ | | |
| **Total amount from other funding sources:** | | | | | | | | **$** | | |
| **Definitions:**  Cash contribution: Funding received by accountable project manager to finance the activity. The funding can come from within DFO or may be transferred from external partners.  In-kind contribution: A contribution of goods/supplies, services, and/or time (from external collaborators) that does not involve the transfer of money. | | | | | | | | | | |
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