Migratory Connectivity in the Ocean (MiCO)

Now with updated functionality: how to access new features and download reports

Summary

- The *Migratory Connectivity in the Ocean* (MiCO) system provides models of the location, movements and important life history stages of marine migratory species such as whales and seabirds to inform their conservation.
- Proteus and Ocean+ have supported work to improve the MiCO system functionality – it now allows direct data downloads of area-use and network models, and PDF reports that summarise information for an area chosen by the user.
- This Explanatory Note describes how Proteus partners can access and use these new features.

What's new in the MiCO system?

Migratory Connectivity in the Ocean (MiCO)[1] is an extensive open-access system that generates standardised models of the locations of marine migratory species' routes, important life history stages (e.g., foraging and breeding "nodes") and seasonality of occurrence.

Impacts and liabilities in the marine realm are not static. The MiCO System represents a state-of-the-art approach to developing fit-for-purpose, actionable knowledge on marine connectivity in the ocean and can support Proteus partners' understanding of operational and environmental risks.

Analyse network models offline

Using animal tracking data from around the world, MiCO produces network models composed of nodes (e.g. breeding sites) and corridors (connections between nodes; Figure 1) that visualize the distribution of migratory species. These models increase our understanding of how marine migratory species use and connect the ocean and can inform operational risk assessments. The updates to the MiCO system allow users to download network models and associated spatial data to better support offline analyses in any software environment.

Proteus and Ocean+ have supported an update to the functionality of the MiCO system so that information is efficiently delivered in automated, useful formats for businesses. Proteus partners can now access PDF reports that summarise connectivity model information for a chosen area and can directly download network models and associated spatial data.

This explanatory note introduces how partners can use the updated functionality of MiCO. The 'System help' section on the MiCO website provides further explanation on how to use the MiCO system and products[2].

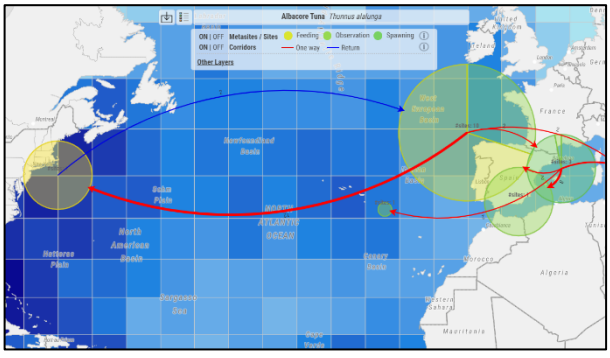

Figure 1. MiCO System map showing a network model for albacore tuna in the North Atlantic Ocean. *Source: https://mico.eco/system (December 2021)*

[1]Migratory Connectivity in the Ocean (MiCO) https://mico.eco/

[2] MiCO System help: https://mico.eco/system-help/

Download PDF reports and network models

The MiCO system now includes updated download functionality which allows users to easily obtain the data as a PDF or an ESRI file geodatabase (zipped). To access the download functionality, select the 'Export' button on the right-hand side of the MiCO online interface (Figure 2A). After agreeing to the Terms of Use, you'll be asked to fill in some basic personal information (e.g., name, affiliation, intended use of data; Figure 2B), which helps to track who is using the data and will inform future development of the MiCO system. MiCO data is licensed under the CC-BY sharing policy and commercial entities are free to use the data, provided it is credited correctly as per its Terms of Use[3].

Generate a PDF report

PDF reports contain a map and a summary of the information it displays[4]. They also include a list of all nodes and corridors for the species of interest with a description, and graphs summarising the types of nodes (e.g. feeding and observation), the sex and age of individuals observed at a node, and a full list of references that were used to produce the data.

To create a PDF report, click on the "Map, Chart & Summary as PDF" button (Figure 2B), which will open in a new browser tab. If it does not appear, please check whether your browser blocks pop-ups. You have the option to export the whole map, or draw a rectangular polygon capturing the area for which you would like a report. If multiple reports are to be exported for different species in the same area, select the "Previous extent" option for consistency.

Generate a file geodatabase

Network models consist of point and polyline features that have a directional component. Their advantage as compared to area-use models is that they explicitly link areas used by the same population of a migratory species. Network models with a directional component can be used to visualize the distribution and movements of migratory species. By adding a buffer to the model features during spatial analyses, partners will be able to identify areas for avoidance and minimisation of nature-related risks when screening and planning new developments and understand how impacts may be transferred between areas by a migratory species.

To download a network model and generate a zipped folder of the file geodatabase(s), click on the "Map Features as ESRI FGDB" button (Figure 2B). The file geodatabase format may include multiple file geodatabases in a zipped folder, depending on what products are displayed in the Map. With this download option, you cannot define the extent. The file geodatabase always includes the products currently selected for display on the online Map.

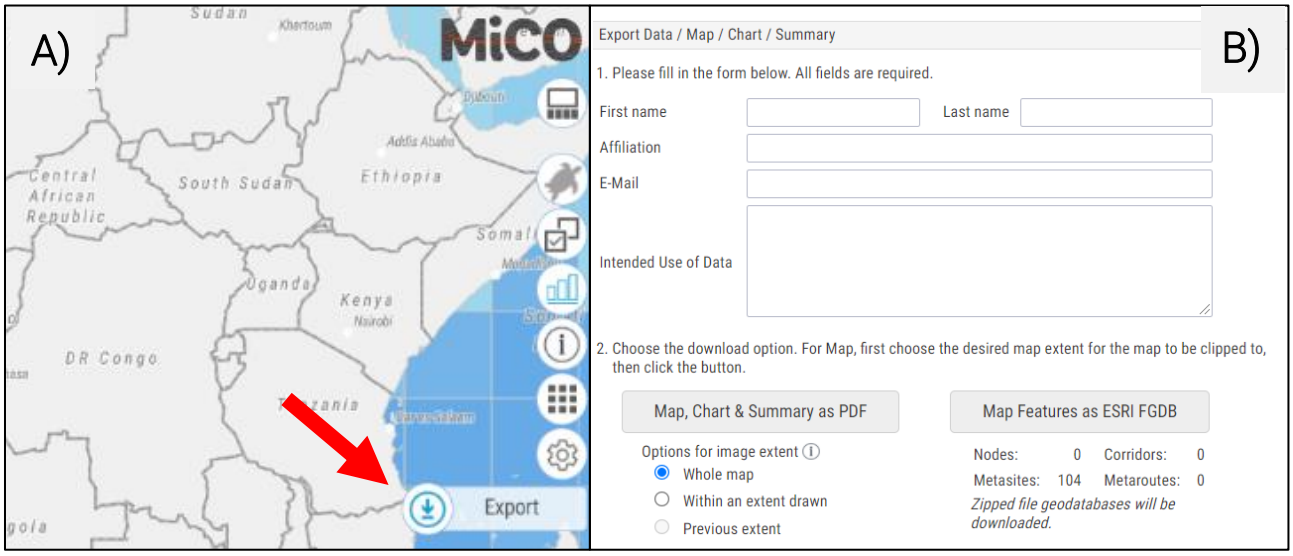

Figure 2. A) MiCO System map with a panel on the right-hand side. The red arrow shows where to export information. B) MiCO System export box, where users can provide personal information and select a download option. *Source: https://mico.eco/system (December 2021)*

[3] MiCO system's data Terms of Use https://mico.eco/terms/

[4] Example MiCO PDF report https://mico.eco/cache/mico/overview/map_image_and_summary-sample_download.pdf

Citation: Upton, J. and Pruckner, S. 2022. Migratory Connectivity in the Ocean (MiCO): Now with updated functionality: how to access new features and download reports. 3 pp.

Authors: Upton, J. and Pruckner, S.

Acknowledgements: The authors would like to acknowledge Ross. A. and Weatherdon, L. for their helpful review and feedback. We thank the Proteus Partners for the opportunity to present this material. Finally, we would like to thank all the MiCO partners and contributors, specifically Daniel Dunn, Corrie Curtice, Patrick Halpin and Ei Fujioka, without whom this effort would be futile.

Contact: oceanplus@unep-wcmc.org