Workshop on Species Distribution Modelling and Environmental Data Harmonisation for Ecosystem and Climate Applications in the South Pacific Ocean

Terms of Reference

1. Background

The Species Distribution Metadata Task Team (SDMTT) was established under the Ecosystem Working Group (EWG) to support future species distribution modelling (SDM) initiatives within the Scientific Committee (SC) of the SPRFMO. As part of its intersessional work, the SDMTT compiled and assessed information on the availability of species distribution metadata across SPRFMO Members and cooperating non-Contracting Parties (CNCPs), providing the first regional overview of datasets that could support future SDM applications.

The SDMTT inventory demonstrated that substantial information exists for key SPRFMO species, including fisheries-dependent and fisheries-independent datasets with broad temporal and spatial coverage. However, important challenges remain regarding data accessibility, metadata standardisation, interoperability, environmental information availability, and spatial consistency among datasets. These limitations may constrain future efforts to develop regional species distribution models, conduct climate change assessments, and provide ecosystem-informed advice.

Recent discussions within the Scientific Committee have highlighted the potential value of species distribution modelling as a tool to improve understanding of species-environment relationships, assess the impacts of climate variability and climate change, support ecosystem-based fisheries management (EBFM), and contribute to ecosystem-informed analyses of species occurring within the SPRFMO Convention Area and adjacent waters of the South Pacific Ocean.

Successful implementation of SDMs requires not only biological and fisheries information, but also consistent environmental and oceanographic datasets, agreed analytical approaches, and mechanisms that facilitate collaboration among Members. Consequently, there is a need to discuss methodological approaches for SDM implementation, opportunities for harmonising environmental datasets and derived variables, and potential pathways for collaborative analyses within the SPRFMO framework.

In this context, the workshop will provide a technical platform to:

- review the outcomes of the SDMTT inventory;
- evaluate the feasibility of collaborative SDM initiatives;
- discuss methodological approaches for SDM implementation;
- identify key information gaps and research priorities;
- explore opportunities for environmental data harmonisation;
- and develop a roadmap for future ecosystem and climate-related applications of SDMs within SPRFMO.

The workshop will contribute to broader ecosystem-based fisheries management, climate change assessment initiatives, and ecosystem-informed scientific advice within the SPRFMO Scientific Committee.

2. Objectives of the Workshop

The workshop will aim to:

1. Review and discuss the outcomes of the Species Distribution Metadata Task Team (SDMTT), including the availability, characteristics, limitations, and accessibility of species distribution data and metadata across SPRFMO Members and CNCPs.

2. Evaluate the feasibility of collaborative species distribution modelling initiatives for key SPRFMO species, including the identification of priority applications, methodological considerations, data requirements, technical limitations, and research needs.

3. Discuss opportunities for harmonisation of biological, environmental and oceanographic datasets, interoperability, and collaborative analytical approaches to support SDMs, ecosystem analyses, climate change assessments, and ecosystem-based fisheries management initiatives.

4. Develop recommendations and a preliminary roadmap for future collaborative activities related to species distribution modelling, environmental data harmonisation, ecosystem modelling, climate change assessments, and ecosystem-informed analyses within the SPRFMO framework.

3. Key Topics for Discussion

The workshop may include discussions on:

- Species distribution metadata currently available within SPRFMO;
- Availability, accessibility and confidentiality considerations of fisheries-dependent and fisheries-independent datasets;
- Metadata standards and harmonisation approaches of biological, environmental and oceanographic datasets;
- Spatial and temporal resolution requirements for SDMs;
- Methodological approaches for SDM implementation;
- Applications of SDMs for climate change assessments and ecosystem-based fisheries management;
- Future priorities for regional collaborations and the development of SDM analyses within SPRFMO.

4. Expected Outputs

The workshop is expected to produce:

1. A workshop report documenting discussions, findings, recommendations, and proposed future activities.

2. An updated overview of species distribution datasets and metadata relevant to future SDM applications within SPRFMO.

3. A preliminary framework describing priority environmental and oceanographic datasets, variables, and harmonisation considerations for future regional SDM applications.

4. A list of identified information gaps, technical limitations, capacity-building needs, and priority research areas.

5. Recommendations regarding:

- species distribution modelling initiatives;
- metadata harmonisation;
- environmental data harmonisation;
- collaborative analytical approaches;
- and future intersessional activities.

6. A preliminary roadmap for the development and implementation of SDMs and associated ecosystem and climate applications within the SPRFMO Scientific Committee.

5. Timing and Format

The workshop is proposed as a three-day in-person technical workshop to be held intersessionally prior to a future meeting of the SPRFMO Scientific Committee.

The workshop will combine plenary presentations, technical discussions, breakout sessions, and collaborative working groups aimed at identifying priorities, harmonising approaches, and developing recommendations for future intersessional activities.

6. Provisional Agenda Structure

Day 1 – Data Availability and Opportunities for SDMs

Session 1. Morning. Opening and Workshop Context

Coffe Break

Session 2. Morning. Outcomes of the SDMTT and Available Data Resources

Lunch

Session 3. Afternoon. Environmental and Oceanographic Data Available for SDM Applications

Coffe Break

Session 4. Afternoon. SDM Applications and Case Studies Relevant to SPRFMO (jack mackerel, jumbo flying squid and other species)

Day 2 – Data Sharing and Harmonisation

Session 5. Morning. Data Accessibility and Collaborative Approaches for Regional SDM Applications.

Coffe Break

Session 6. Morning. Harmonisation of Biological, Fisheries, and Metadata Standards

Lunch

Session 7. Afternoon. Harmonisation of Environmental and Oceanographic Data

Coffe Break

Session 8. Afternoon. Breakout Discussions and Synthesis

Day 3 – Roadmap for SDM Development in SPRFMO

Session 9. Morning. Future Applications of SDMs for Ecosystem and Climate Analyses

Coffee Break

Session 10. Morning. Towards a SPRFMO SDM Framework

- What products are expected from SDMs?
- Who would lead future work?
- What species should be prioritised?
- What data gaps prevent implementation?
- What intersessional activities are needed?

Lunch

Session 11. Afternoon. Roadmap and Future Intersessional Activities

Coffe Break

Session 12. Afternoon. Recommendations to the Scientific Committee and Workshop Closure