FAC-05 Doc 05 Suppl.4

Database software development and update

Secretariat

Last year the Secretariat provided an explanatory note FAC4-Info1 on *"Database development"*. In relation to this note the FAC4 report contained the following text:

"Furthermore, with a view to the forecast budget for the financial year 2018-19, Members asked that the projected costs for database development be supported with a business case which included commercial quotes". This paper partially addresses last year's request.

The SPRFMO Database:

The SPRFMO database and front end was set up by the Interim Secretariat and was based on the interim Data Standards that were developed during the SPRFMO Preparatory Conference held from 2010-2012. Most of the features were in place by late 2012 and the system has had only minor modifications since then.

The data load process has an extensive in-built validation procedure which detects any data quality issues (for instance identifying duplicate vessels, inconsistent vessel features, impossible times etc) and an "Odata" feed was recently implemented to enable the Secretariat to query across the various modules contained within the database (including vessel, fishing activity, catch, VMS, observer and landings).

The SPRFMO database front end is accessible via a secure web log-in and is coded in Microsoft visual basic. The various data holdings are held in a secure, structured and standardized Microsoft SQL Server. The current modules within the SPRFMO Database are:

- The SPRFMO Record of vessels (including the history of authorisations and vessel changes);
- Annual catch data for all species and all participants as required under CMM 02 Paragraph 1a
- Fishing Activity data as specified under CMM 02 Paragraph 1b
- Landings data as specified under CMM 02 Paragraph 1d
- Observer data as specified under CMM02 Paragraph 2c
- Vessel Monitoring System data as specified under CMM 02 Paragraph 3
  (prior to the activation of the Commission VMS)
- Bottom fishing management areas

The front-end tool allows data entry of annual catches and automatic upload of most of the other datasets that the SPRFMO Secretariat receives, if they are submitted in standardized Excel templates as specified in CMM 02. Files may be uploaded either by Secretariat staff or by authorised Participant users.

Vessel data is also maintained on a daily basis using the SPRFMO database front end - adding new authorisations, changing vessel details, adding links to photographs provided, and always maintaining a complete history of vessel details and the dates that changes became effective. The system is fully consistent with SPRFMO Data standards, for example using FAO codes such as fishing method and species codes.

Figure 1: Screenshot of the data entry tool for Annual Catch information

The data is available in a searchable database with a user-friendly interface. The results of queries from most of the datasets can be exported directly from the system into excel. The system allows for remote access of various users at different levels of authorisation (eg. users can only access their own data).

Where appropriate data can be made available automatically to other systems such as the Commission VMS (via an OData feed) and the SPRFMO website. The SPRFMO Record of Vessels on the SPRFMO database is in fact part of the SPRFMO database front end, and is populated instantaneously and automatically from the SPRFMO database, allowing information such as vessel names, IMO numbers and authorisation status to be publicly available.
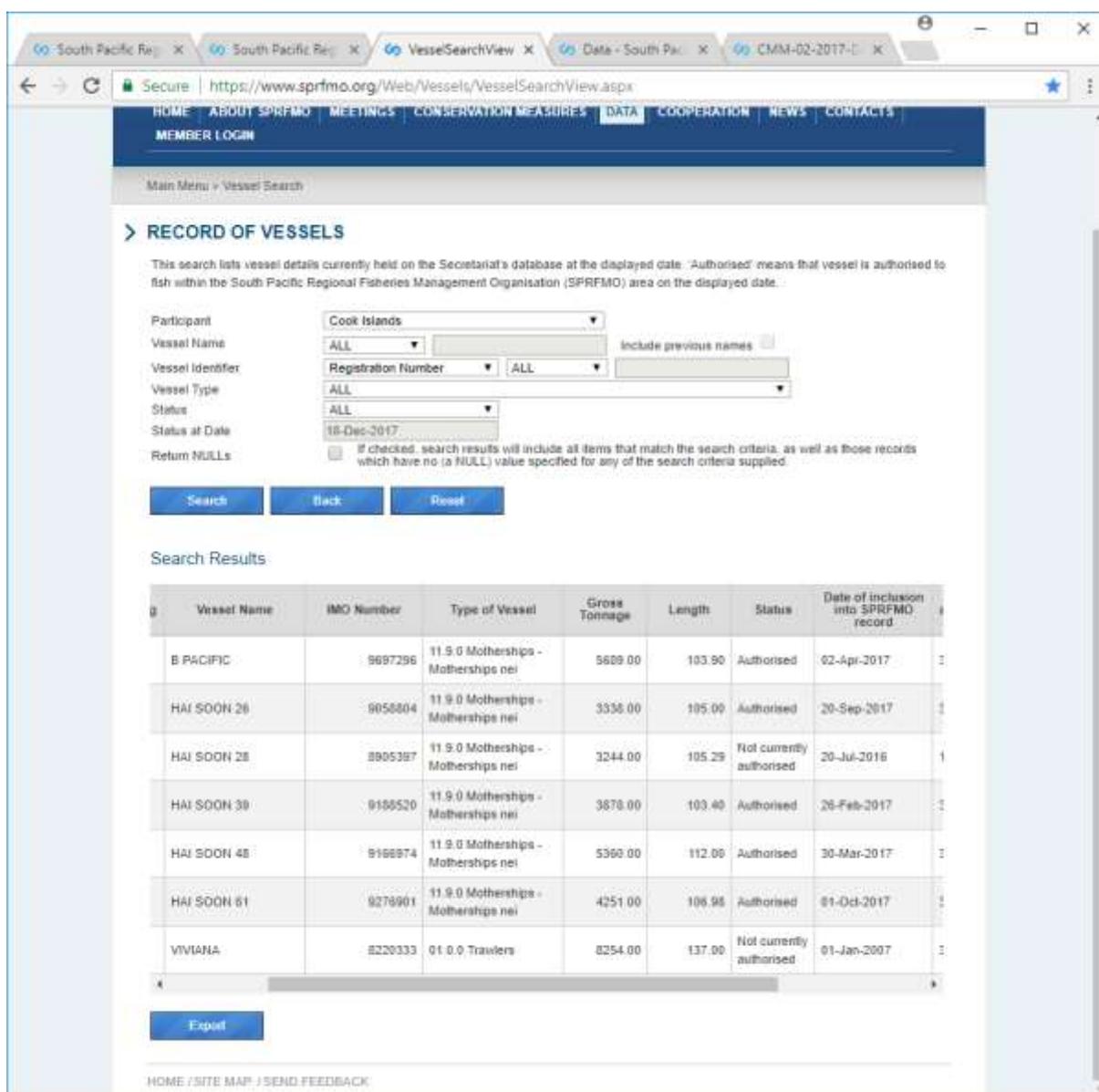
Figure 2: Screenshot of the Vessel Record, part of the SPRFMO database front end

The system is secure, having been previously tested by a third party. Modification of original data reports is not possible, except with comprehensive logging facilities. It is hosted by FINNZ, an organisation based in Wellington that has a great deal of experience in fisheries related software development. The Secretariat has a maintenance contract with FINNZ for the system, which ensures a comprehensive backup and disaster recovery plan, a comprehensive helpdesk service and an agreed escalation plan in the event of critical failures.

Possible development options:

The system is robust, and has not needed any substantial modification since it was first implemented in 2011. However, some updates to the system are now advisable, mostly in response to recent or proposed amendments to CMM-02 (Data standards) and others.

Enhancements to be considered that would enable closer consistency with CMMs:

- A module to allow storage of Observer Jigging data;
  - *No data currently*
- A module to allow storage of Observer Potting data;
  - *No data currently*
- A new module to allow storage of the Port inspection register associated with CMM 2.07
  - *Currently stored in an excel spreadsheet and manually uploaded to the member website*
- A module to allow storage of Handlining Fishing Activity data;
  - *As submitted by one Member*
- A module to allow storage of Transhipment data;
  - *Currently stored in 2 Excel spreadsheets*
- Modification to the Bottom Fishing Management area module to allow separation of Bottom trawl, Midwater trawl, Lining, All Methods, Exploratory as well as future Potting & VME Management Areas;
  - *When the system was designed only Trawling and Longlining areas were foreseen*
- Modification to allow submission of invertebrate species in annual catch data
  - *When the system was designed, only finfish species could be reported in Annual Catches. But now under the adopted CMM02 "all species/species groups caught during that year" should be reported*
- Modification to allow vessel registration numbers of more than 14 characters in Fishing Activity data,
  - *one Member uses vessel registrations containing up to 38 characters, which was not envisaged when the system was designed*

Enhancements to improve accessibility:

As mentioned above, authorised users can currently use the SPRFMO database front end to submit and view their own data. The Secretariat also has an OData feed that has been successfully used to make appropriate data available both to the Secretariat for general data query purposes, and to the Commission VMS vendor to synchronize vessel data. One enhancement would allow users to access their data as held in the SPRFMO Database via an automated feed of data into their own systems.

There is also potential to develop dashboards providing an overview of appropriately limited reports.

Investment for future maintainability:

The SPRFMO database and front end are now based on 10-year-old specifications and technology. While it is absolutely fit for purpose in the current environment, responsible IT management suggests that thought be given to ensuring that future changes to the system are cost effective. While continuing to use the same database, it is likely to be more cost effective in the long term to develop additional modules or functionality by utilizing newer technology and gradually transitioning to a system that is easier/cheaper to maintain.

RECOMMENDATIONS

The Secretariat approached FINNZ during September 2017 to discuss the enhancements presented above and to request pricing. Whilst we remain hopeful that we will have figures to present to the FAC5 we do not have any commercial quotes available currently.

Of the development options presented above the two that the Secretariat considers the most important and cost effective are:

- A module to allow storage of Transhipment data.
- Modification to the Bottom Fishing Management area module to allow separation of Potting, Bottom trawl, Midwater trawl, Lining, All Method and VME Management Areas.

Transhipment:

The Secretariat receives a lot of transhipment data and this is projected to increase as fishing companies become more familiar with the SPRFMO requirements and obligations are extended across into other fisheries. The types of Transhipment data currently received are:

- Annual summaries – all Transhipments
  - o CMM 02 para 1d) & 1e) – Due 30th June, *(reefer and catcher)*
- Transhipment period
  - o CMM 12 para 4 - *Reefer only, no data received*
- Transhipment notifications – Jack mackerel and demersal only
  - o CMM 12 para 4 – due 12 hrs prior, *(reefer and catcher)*
- Transhipment details – Jack mackerel and demersal only
  - o CMM 12 para 8 – due 7 days afterward, *(reefer and catcher)*
- Observed Transhipment details – Jack mackerel and demersal only
  - o CMM 12 para 6 – due 15 days after observer disembarkation (*Observer*)

This means for one transhipment the Secretariat can expect to receive data relating to that event 8 different times (excluding any updates/corrections). The Transhipment data is currently being stored in standalone Excel spreadsheets and this makes it difficult to combine with other data sets and the unstandardized nature makes analysis very time-consuming.

Bottom Fishing Management areas

The Bottom fishing management areas module has provided a secure, standardized storage for the historic footprints submitted by Australia, Chile, Korea, and New Zealand. However, the way it has been designed it is limited to areas associated with Long Lining and Trawling methods. Two of the currently proposed CMMs foresee areas associated with Potting and midwater trawling. In addition, CMM 14 (the NZ exploratory fishery for toothfish) was conducted within defined management areas and an enhancement to this module would allow these areas to be defined and stored within the SPRFMO Database.

The Secretariat would appreciate the Commission's direction and guidance on its expectations for the continued development of the SPRFMO Database.