



World Register of Introduced Marine Species Editor Workshop

Flanders Marine Institute (VLIZ) - Oostende, Belgium
23-25 April 2018

REPORT

Participants:

World Register of Introduced Marine Species (WRiMS) editors:

Mark Costello, Bella Galil, Agnese Marchini, and Marc Rius

WoRMS Data Management Team (DMT):

Leen Vandepitte, Wim Decock, Bart Vanhoorne, Kevin Verfaillie and Thomas Lanssens.

Other invited participants:

Quentin Groom, Ayco Holleman, Frances Lucy, Vadim Panov, Hanno Seebens, Thomas Verleye.

This workshop was the second meeting of the WRiMS editors after Sydney 2016, and the first with the Data Management Team (DMT) based at VLIZ. The workshop provided an invaluable opportunity for discussing more efficient ways to coordinate the work of the editors, as well as between the editors and the DMT. The editors learned how to use the available online tools, which will allow for a more efficient editing of the WRiMS content. This workshop is seen as the start of a continuing development and improvement of WRiMS.

The workshop started with a presentation by **Leen Vandepitte** to explain the background of the Flanders Marine Institute (host of the workshop and first marine station in the world inaugurated by P-J van Beneden), the Aphia system (interface used to run WoRMS, WRiMS and other databases) and the Belgian LifeWatch infrastructure (which provided funds to run the workshop). [*full presentation is available in pdf*]

Mark Costello presented the history of WRiMS, which was launched in 2015 from a file compiled by Shyama Pagad. It was noted that no terrestrial database integrates all species as WoRMS does. Mark Costello presented his idea for the paper that will introduce WRiMS to the scientific community and will include some results from the preliminary analysis conducted by two MSc students that he is currently supervising.

It was noted that the success of other databases (such as FishBase) was based on providing data that is applicable to research questions. The resulting publications help to improve the database, and further raise its utility and visibility to the scientific community.

Frances Lucy presented the INVASIVESNET society (<https://www.invasivesnet.org/>) and encouraged the WRiMS editors to join (membership is free until the end of the year).

Hanno Seebens presented his research on global spread and accumulation of non-indigenous species. He has specialised in big data analysis and modelling. He has specifically focussed on the spatial dimension of species invasions, analysing the influence of network of global shipping for marine species invasions (Seebens *et al.* 2013. *Ecol Lett* 16: 782–790). He has also analysed the temporal patterns of bioinvasions by studying the accumulation of introduced species (Seebens *et al.* 2017. *Nat Comm* DOI: 10.1038/ncomms14435), and the “emerging alien species” by studying the first record of species in different regions (Seebens *et al.*, 2018. *Proc Natl Acad Sci USA* 115(10): 2264-2273). He is interested in studying the attributes that make marine introduced species a special subset of the total pool of known marine species. He is currently analysing historic shipping dynamics and the effects of sampling intensity by analysing OBIS data.

Ward Appeltans presented the work that he is conducting in OBIS and stimulated a discussion on ways to better connect OBIS and WRiMS webpages.

Progress on the WRiMS editors' community

During the workshop the participating editors Mark Costello, Bella Galil, Agnese Marchini, Vadim Panov and Marc Rius were appointed as the interim steering committee of WRiMS. This will enable them to coordinate actions to improve the WRiMS database. This committee, including a DMT member, will:

- coordinate actions (long-term plan, priority lists, deadlines, etc);
- appoint an elected steering committee by the end of the year;
- identify specific gaps from data and priority actions.

Communication among WRiMS editors

In order to facilitate communication and information exchange, a mailing list (wrimms@marinespecies.org) that includes all the WRiMS editors and the DMT has been made available by the DMT.

A manual for the editors is permanently online and kept updated by the DMT:

<http://www.marinespecies.org/aphia.php?p=manual>

and also accessible through the “My Aphia” interface when logged in.

Any other doubts or issues that may arise can be consulted to the Data Management Team at:

info@marinespecies.org

Improving the information in WRiMS

The interim steering committee has agreed on a number of priority actions to improve WRiMS.

Number of species included

- ⇒ It was identified that some species currently in WRiMS are of uncertain origin, or mistaken records. This needs to be corrected. The literature cannot be taken as always correct but needs to be cited and any expert comments made to inform WRiMS users of the correct status of species records.
- ⇒ Several species are missing from WRiMS. Editors are required to enter the missing species from their taxa or their region.

Missing references

- ⇒ It was identified that one of the priorities for completing and optimising WRiMS was to add or correct references to species distribution data. The DMT will circulate a spreadsheet with species that lacked references.
- ⇒ The WRiMS editors practiced updating references on the WRiMS interface. Note one needs to press 'Generate' button to edit new reference records.
- ⇒ The DMT explained it is possible to enter the DOI of a publication (when available), click the button "Parse" and the system will find the publication and automatically enter the reference details. This allows editors to save time.

Revision of the terminology

- ⇒ The WRiMS editors identified the need to revise the terminology (one of the top menu of the WRiMS webpage). However, it was noted that the cryptogenic status of species is identified in the WRiMS webpage by the context of species of uncertain origin.
- ⇒ Shyama Pagad forwarded a review of current and new CBD and IUCN terminology. A group of editors was appointed to review this, as well as what is in WRiMS already, to ensure it if fit for purpose and definitions are clearly written.

Species distributions

- ⇒ Distribution data in WoRMS is by default the native range. However, it was noted that the species distribution information in Aphia is far from complete. Furthermore, several species are currently affected by confusion when distinguishing between native and introduced distribution.
- ⇒ During the workshop, a few distribution records were fixed by the WRiMS editors and "Notes" were added where appropriate.
- ⇒ WRiMS editors will have to continue improving the level of detail of species distributions (e.g. North Sea rather than North Atlantic, otherwise some species appear to have a global distribution, which does not correspond to reality). They will enter the exact distribution (locality) as mentioned in the publication, and enter the year when the species was first detected as introduced.
- ⇒ The word "origin" (one of the fields to be filled when a species is introduced) is misleading. It will be changed by the DMT to "status".
- ⇒ In due time, when the manuscript about WRiMS is prepared, the editors will decide whether this content should be included in the same manuscript or needs to be done separately.
- ⇒ It was agreed that point localities are more accurate and useful than polygons (shapefiles). OBIS specialises in these. Ward Appeltans of OBIS agreed that his team would (1) flag species in OBIS as 'introduced' (anywhere), (2) use WRiMS polygons for alien species occurrence, to note where species are introduced. The remaining distribution will be assumed to be native.
- ⇒ WRiMS will forward information on holders of alien marine species data to the relevant OBIS node.
- ⇒ To judge the value of including GBIF data as well as OBIS, the DMT will provide an overlay of GBIF records on WRiMS species maps to logged in editors only.

Additional information.

In addition to taxonomy, geography, literature, WRiMS can provide (through WoRMS) information on Genetics and Ecology of each introduced species. This is not restricted to introduced species but will be an interesting source of information when will be comprehensive.

Genetics: The accession number from GenBank for each species.

Attributes: Trait information for each species. The structural composition of animal body has been made already available. More traits will have to be completed in the future, e.g. colonial – solitary, brooding – non-brooding.

WRiMS branding and outreach

- ⇒ As part of the branding exercise, it was decided that the abbreviation of the World Register of introduced Marine Species will be 'WRiMS' and not 'WRIMS'. The small 'i' emphasises the introduced and distinguishes it from other possible acronyms. Also 'i' is used for iPad, iPhone, and suggests digital or electronic tool.
- ⇒ Marc Rius and Leen Vandepitte will write a news item for WoRMS and LifeWatch websites.
- ⇒ The results of this workshop will be presented by Leen Vandepitte during the 4th World Conference on Marine Biodiversity, Montréal (Québec, Canada), 20-23 May 2018.
- ⇒ The results of this workshop will be presented by Marc Rius in the next NEOBIOA conference, which will be held in September 2018 in Dublin, Ireland.
- ⇒ The results of this workshop will be presented by Agnese Marchini during the next International Conference on Marine BioInvasions, which will be held in Argentina in October 2018.
- ⇒ Mark Costello will prepare a flyer based on the one previously used in WoRMS to disseminate in the World Conference of Marine Biodiversity and others (NEOBIOA conference).
- ⇒ Marc Rius will meet Tammy Horton and discuss the deep sea app, it maybe will inspire a way to get one for WRiMS.
- ⇒ A paper led by Mark Costello will be prepared to describe this first stage of WRiMS implementation.
- ⇒ News section for WRiMS webpage?

A table including other online resources related to WRiMS will be included, including for example AquaNIS

An email will be prepared to be sent to all WRiMS editors, that will explain the immediate actions of the WRiMS community in order to achieve specific goal (we need a mission by the end of 2018).

- Explain that there is an online tutorial (top menu at the WRiMS webpage) that clearly explains the steps needed for online editing of the WRiMS webpage.

Draft paper

Revise the draft paper that Mark Costello sent around with a deadline for submission of August 2018.

Points to decide:

- It was discussed the possibility to submit in *Management of Biological Invasions* journal, which could be followed by subsequent publications to update content after a few years.
- It was highly debated the inclusion or not a list of species found in WRiMS, due to current inaccuracies and gaps in the data. It was agreed to include the list of species in WRiMS with direct links to their species page. Thus readers would go direct to the most up to date information. Their geographic distribution and invasive status would not be stated in the list. The editors are therefore encouraged to contribute correcting and updating in WRiMS the list of introduced species that will eventually be published.

Actions

The current editors are encouraged to confirm their willingness to contribute and possibly suggest a list of new potential editors of WRiMS to cover unrepresented taxa and biogeographical regions (e.g. northern and southern America).

Editors that are identified as editors of '(biota)' at the WRiMS webpage are encouraged to identify specific regions and/or taxonomic groups, so gaps are more easily identified.

An editorial coordinator (Agnese Marchini: agnese.marchini@unipv.it) will be in charge to receive suggestions and send invitations to the new editors.

Gaps in editorial board

Major editorials gaps were identified on algae, barnacles, echinoderms, serpulids and fishes. Regarding specific regions, North and South America, Singapore, Hong Kong and Taiwan are missing. We will contact specific people, as well as all WoRMS editors to try to attract their expertise to WRiMS.

Proposed new editors:

- Ruth O'Riordan for barnacles
- Elena Kupriyanova for serpulids
- Darren YEO Chong Jinn for Singapore
- Thomas Therriault as representative of PICES
- Kike Ballesteros for Algae
- Echinoderms?
- Fish – Mark and Leen to discuss with FishBase.

WRiMS terminology

A working group would review the terminology already in WRiMS, including definitions, and new 'standards' proposed by IUCN for the CBD provided by Shyama Pagad. Members = Marc Rius, Mark Costello, Shyama Pagad, Bella Galil, Agnese Marchini, Quentin Groom.

Checking and updating data in WRiMS

Steps to add a species to WRiMS:

- 1) Login to <http://marinespecies.org/introduced>
- 2) Search taxa: enter the name of the species to be added
- 3) Does the species exist in WoRMS? NO → contact the DMT and send taxonomic details for them to enter the species (e.g. this can happen when a species is newly described from an area where it is introduced). YES → click [add] for adding an introduced species and its distribution through WRiMS.

Updating distributions

Regional Editors – Please go to WRiMS website. Under "Distributions" enter your geographic region and Search. Check if the list of species is complete for your region. Are there species incorrectly reported as present in your region? Please let Agnese Marchini (agnese.marchini@unipv.it) know by mid June 2018.

or

Taxon editors – Please go to WRiMS website and review your taxon. Are there missing species or species listed as Introduced incorrectly? Please let Agnese Marchini (agnese.marchini@unipv.it) know by mid June 2018.

All WRiMS editors – If not already familiar with the WRiMS editing options, read the Tutorial on the WRiMS website. If you want an introduction to the system please contact the DMT at info@marinespecies.org to arrange a video conference tutorial.

Deadlines

1. **By the end of June** please log into WRiMS and correct any mistaken entries (if any).
2. **By the end of July** please add any missing species.
3. Subsequently add any new localities and references to the species in your region / in your taxon.

Images – Editors are asked to check if the introduced species they are editing are provided with suitable image in WRiMS (via WoRMS). If not, they are encouraged to provide one image with permission to publish.

Technical support

- In order to facilitate the above tasks, the DMT can send to editors an Excel file with the available distribution records to be checked, references missing, etc. The editors interested shall contact the DMT at info@marinespecies.org.
- In order to complete the tasks and improve specific aspects of the dataset, it is suggested to host students for internships and offer student projects in the institutions of other WRiMS' editors. The DMT can provide a temporary access to specific parts of the webpage to allow the student to add information.

Layout and Data management actions by the DMT:

- New look to WRiMS webpage. The WoRMS webpage has a new and really attractive look, a new template that can also be incorporated to WRiMS.
- Add links between WRiMS and other relevant webpages.
- Replace 'WRiMS' with 'WRiMS' everywhere in the WRiMS webpage.
- Add more visible and clearer disclaimer about the current incompleteness of the species distributions in Aphia.
- Add a disclaimer as follows: "If you have additional data on introduced marine species please contact us at wriMS@marinespecies.org. This may include publications not referenced in WRiMS, corrections to past records, and new datasets with locality, latitude, longitude and date coordinates."

Future data analyses

Once completed and corrected, the WRiMS database will offer the opportunity to provide global patterns and respond crucial scientific questions of high interest to biodiversity managers and scientists. These analyses could include the identification of:

- Global hotspots of marine introduced species (geographic and species distribution analysis). – need to define native as well as introduced range
- Number of marine introduced species per taxonomic groups.
- Time since introduction - first record (in the database as 'begindate' – around 1500 species out of 1800).
- Rate / Time of introductions - from distribution records
- Relate all the above to human activities – shipping, aquaculture, socio-economic parameters of human populations, location of major harbours.

Editors have the opportunity to be authors on papers arising from WRiMS but this is not automatic and needs to comply with best practice (e.g. the [Vancouver Guidelines](#)). Thus they should be involved in study design and execution.

Editors wishing to lead or contribute to particular analyses should propose their ideas to wriMS@marinespecies.org.