

Interactive comment on “Digital map of the Coral Triangle: An online atlas for marine biodiversity conservation” by Irawan Asaad et al.

Irawan Asaad et al.

i.asaad@auckland.ac.nz

Received and published: 5 November 2018

1. Referee comments

Overall I find this paper to be of high quality in terms of its description of a comprehensive and useful online atlas for the Coral Triangle. In terms of well-established definitions of "online atlas" as applied to ocean and coast, aka "coastal web atlases," the authors might refer to the definitive work of Wright, Dwyer, and Cummins (2011) and reference it accordingly (especially in lines 51-53). Wright DJ, Dwyer E, & Cummins V eds (2011) Coastal Informatics: Web Atlas Design and Implementation (IGI-Global, Hershey, PA), p 350.

2. Response

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Thanks, we have added the definition of “online atlas” based on Wright et al (2011):

3. It is now read:

“For the coastal region, the application of web-atlases exists (e.g, Ireland Marine Atlas (atlas.marine.ie), Oregon Coastal Atlas (www.coastalatlases.net), The European Atlas (Barale et al 2015)). These coastal web-atlases have a variety of function such as serve as a web resources, data repository, interactive maps, and provide different type of geospatial analysis tools. Therefore, Wright et al (2011) define that the coastal web-atlas is “a collection of maps with supplementary tables, illustrations and information which systematically illustrate the coast”

1. Referee comments

With that in mind the authors may want to rethink their title, as a digital map by itself is not necessarily equivalent to an online atlas. Technical a digital map could even be a pdf file that is placed online for someone to look at and download. But this falls very much short of what the authors intend. An online atlas is made up of a *series* of live, **interactive** digital maps, as well as other resources (which could be static pdf files, downloadable data or data via web services, videos, etc.).

2. Response

We choose the term “Digital map” for our atlas as a “neutral title” that can be fit and explain all of the information within our atlas. Following reviewers suggestions and to make it consistent with the “series” and “interactive” function, we have replace the title to: An interactive atlas for marine biodiversity conservation in the Coral Triangle”

1. Referee comments

The paper could be improved by a brief statement or two much earlier in the paper as to the intended audience for the atlas (e.g., what particular organizations, governments, or initiatives). This might be most easily remedied by taking lines 209-223 and placing them in the introduction. These lines provide important history and context that

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should greet the reader earlier in the paper. And further, given the effort put into this atlas and its obvious power and utility, was it intended as a contribution to the Coral Triangle Initiative (e.g., Fidelman P, et al. (2014) Coalition cohesion for regional marine governance: A stakeholder analysis of the Coral Triangle Initiative. *Ocean & Coastal Management* 95(0):117-128). The paper does mention on line 72, the Coral Triangle MPA Network, so this might be equivalent. Perhaps make mention of these broader initiatives.

2. Response

We have revised the paragraph by moving the paragraph from Discussion sections and adding sentences of the objective of CTI that linked to our atlas

3. It is now read:

“To take advantage of the potential of web-mapping, here we developed a web-mapping application for the Coral Triangle (CT) region of the Indo Pacific realm, a global hotspot for marine biodiversity conservation due to its superlative species richness and endemism (Hoeksema, 2007; Allen, 2008; Veron et al., 2009; Polidoro et al., 2010; Walton et al., 2014; Saeedi et al., 2016). Because the region has the highest density of marine species of anywhere in the ocean, it is a priority for marine conservation. Furthermore, a large amount of biodiversity and natural resources data have been collected for decades by scientists and numerous conservation programmes. However, data repositories are scattered, and access to such data are limited. Previously, a systematic geographic prioritization to develop Marine Protected Area (MPA) system was conducted (Asaad. et al., 2018a; 2018b), but this alone does not make the information easily available to the public. In addition, previous online atlas of the CT was developed to support coral reef management and provided biophysical and MPA data from the region (Cros et al., 2014), however an updated, more systematic and comprehensive “biodiversity informatics” datasets are required to showcase all of the available data in the region. Further, this web-atlas is aimed to support the objective of the

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CTI-CFF initiative (the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security). The CTI-CFF initiative is a multilateral partnership of six countries (Indonesia, Malaysia, Papua New Guinea, the Philippines, Solomon Islands, and Timor-Leste) to working collaboratively to conserve and sustainably manage their coastal and marine resources (CTI-CFF, 2009, 2013). One of the objectives of this initiative is to establish and effectively manage Marine Protected Areas (MPA) network, which emphasizes the importance of developing and managing MPA throughout the region. In addition, an MPA system framework was developed to guide the development of network of MPAs in the region (Walton et al., 2014). Thus, the collections of geospatial data collated on this online GIS database are designed to support and assist in the development of marine protected areas and management of marine resources in the region. By giving an access to policymakers, scientific communities, and the general public to the most comprehensive, up-to-date and integrated spatial information available for the Coral Triangle”

1. Referee comments

This atlas should most definitely be made known to the International Coastal Atlas Network, <http://ican.iode.org>, a program within the United Nations Intergovernmental Oceanographic Commission’s International Oceanographic Data and Information Exchange (IODE). And to that end, the authors might make a comment or two about features of the atlas that show its good design for conservation and resource management audiences. The authors should consider reading and citing: Kopke K & Dwyer N (2017) ICAN - Best Practice Guide to Engage your Coastal Web Atlas User Community. IOC Manuals and Guides 75, IOC/2016/MG/75, Intergovernmental Oceanographic Commission of UNESCO, Paris, 35 pp., <http://ican.iode.org/news/38-ican-cwauuser-interaction-guide>. With regard to the Conclusion, this might be folded into the Discussion above and called "Discussion and Conclusion" unless in conflict with the journal’s guidelines. As it stands, the "Conclusion" is more of a "Summary" rather than a conclusion. It merely restates the abstract and does not provide "conclusions" in terms of

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the outcome of an actual spatial analysis or even a benchmark/performance/use case review of your atlas, nor any recommendations as to its use.

2. Response

We have revised the discussion and removed the conclusion section. With regards to broader initiatives (e.g., UN IOC IODE, the GEO Marine Biodiversity Observation Network, ICAN etc), We have tried to contact and connect our Web Atlas to several initiatives. We will be very appreciated, if the reviewer introduce this atlas to your network as well.

3. We have added paragraph about future directions of the atlas:

“There are opportunities to improve and advance the geospatial functionality of this Coral Triangle atlas. An envisioned future version of this atlas is a dynamic online database which provides tools to add, upload and store new biodiversity data (e.g., species occurrence data). The growing trend of citizen science opens an opportunity to collect and integrate potentially massive amounts of data to fill gaps in the biodiversity data records. In addition, the availability of options to run online spatial analysis tasks such as identifying priority areas or delineating protected reserves in a defined geographic extent or for a specific dataset may offer an opportunity to further enhance the performance of this digital map.

In addition, the next step is to develop a network and connection to global initiative such as the IODE-ICAN (International Coastal Atlas Network), the Global Health Ocean Index (www.oceanhealthindex.org), the GEO-Marine Biodiversity Observation Network (boninabox.geobon.org), UNEP-WCMC Network (data.unep-wcmc.org) and others network related to the UN SDG 14 goal and the upcoming UN Decade of Ocean Science. This type of atlas potentially fills regional gaps data within such global initiatives and provide more details information that can be used to develop a region based biodiversity conservation strategy.

1. Referee comments

With regard to minor technical suggestions: line 45 - references to works about GIS or internet/web GIS are in the hundreds now and the field changes rapidly there are much more appropriate references than Chang (2016) for an intro to GIS and Moretz (2008). Instead of or in addition to Chang (2016) I would suggest: Wright DJ ed (2016) Ocean Solutions, Earth Solutions, 2nd Edition (Esri Press, Redlands, CA), 500 pp. and Hamylton SM (2017) Spatial Analysis of Coastal Environments (Cambridge University Press, Cambridge) p 290. And instead of Moretz (2008), Moretz (2017): Moretz, D, In Shekhar S, Xiong H, Zhou Z eds (2017), Encyclopedia of GIS, 2nd Edition (Springer Intl, Cham, Switzerland), 1074-1081.

2. Response

As suggested, we have amended the references from Chang (2016) to Wright et al (2016) and from Moretz (2008) to Moretz (2017).

1. Referee comments

line 87 - ArcGIS Pro 2.0 is a singular entity, not plural

line 258 - "... technical assistance [in] developing this digital map" should be "... technical assistance in developing this online atlas."

2. Response

We have corrected these grammatical errors

Interactive comment on Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2018-80>, 2018.

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