FWBON Newsletter – August 2024

About FWBON

The Freshwater Biodiversity Observation Network (FWBON) is a global community of practice, unified in the goal to improve biodiversity observations in inland waters (including estuarine and freshwater ecosystems). FWBON is a thematic network within the Group on Earth Observations Biodiversity Observation Network (GEO BON). We contribute to building the global capacity for monitoring freshwater biodiversity and conducting assessments. Essential Biodiversity Variables (EBVs) serve as a conceptual framework underpinning the activities of GEO BON and thus also FWBON.

The EBV framework is also used to support monitoring and reporting changes to targets of the Kunming-Montreal Global Biodiversity Framework (GBF; https://www.cbd.int/gbf) for 2030, the Sustainable Development Goals (SDGs) and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). To achieve our goals, we apply an inclusive approach, reaching out to colleagues working in all regions of the globe and in diverse backgrounds, which explicitly includes Indigenous Knowledge.

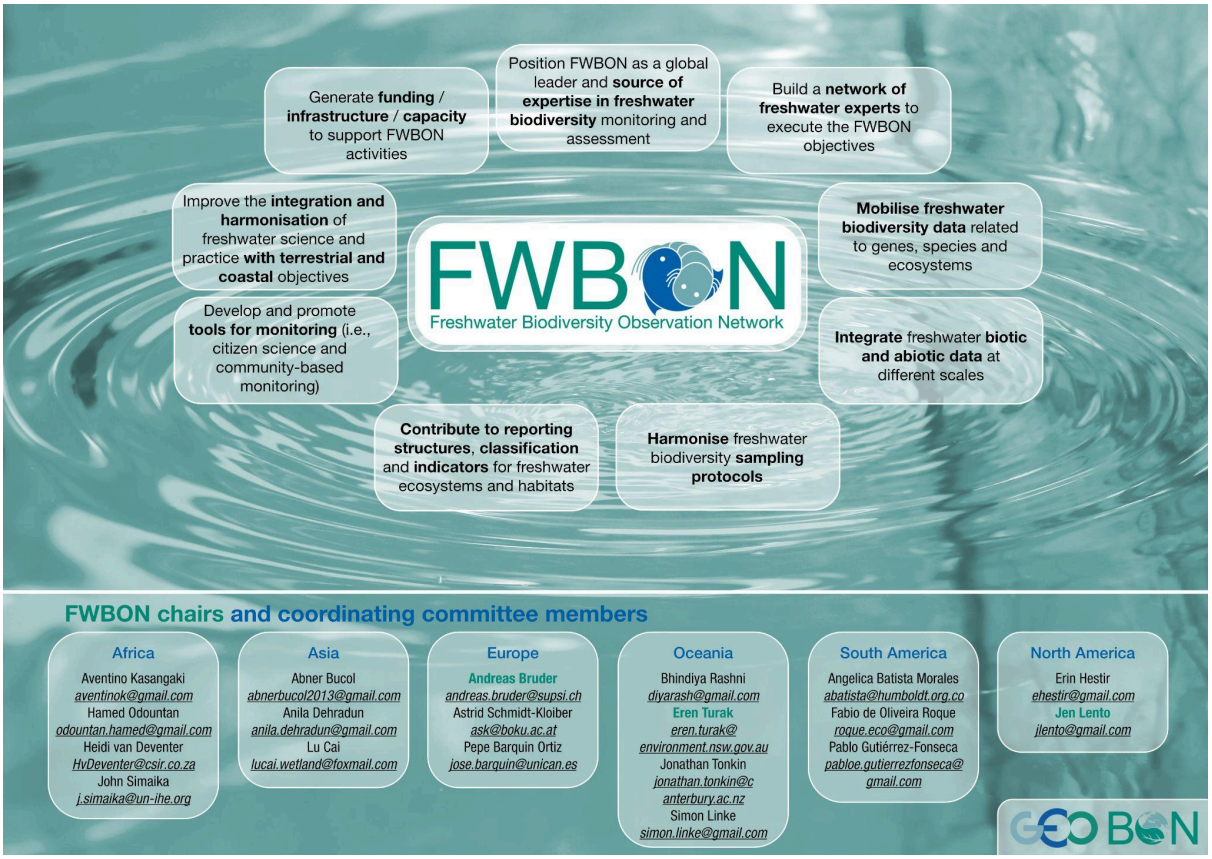


Figure 1: Conceptual framework and contacts of FWBON

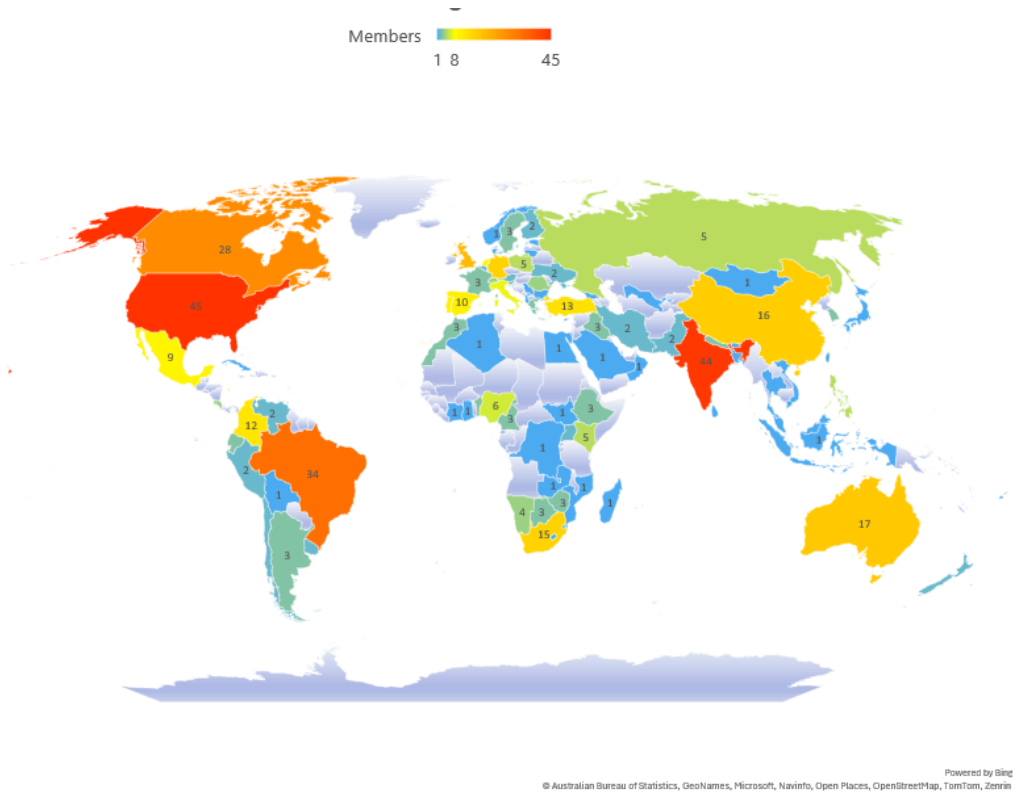


Figure 2: FWBON membership around the world, coloured by the number of members in each country

GEOBON and FWBON now on Discourse

GEOBON launched Discourse in January 2024 as an online discussion platform for its members to harness the potential offered by the large and rapidly increasing membership. Discussions during the GEOBON Conference in Montreal in October 2023 highlighted the need to facilitate greater engagement from the global membership (3163 members from 148 countries as of April 29, 2924) through the creation of multiple online communities, and Discourse was chosen as the tool to facilitate this. At the end of February, the GEOBON secretariat invited FWBON to begin a trial of the system by starting to build the FWBON Community in Discourse and reporting experiences back to further improve the platform. Since then, FWBON Co-Leads have been working on building the FWBON community through reaching out first to the entire global membership (460 members; Figure 2) and then to specific groups of members and individual members, welcoming each member to the FWBON Community on Discourse, identifying key ongoing topics, initiating discussions, and establishing connections among members based on shared interests. This has been very useful to get active discussions in the FWBON Community, for instance on the recent initiative on thematic groups within FWBON.

As the first thematic BON or GEOBON Working Group to explore Discourse, FWBON is providing a real-life example of building an online community that is likely to be useful for all other GEOBON groups. There are already 138 participants in the FWBON community. These include FWBON members from 42 countries as well as all co-leads of MBON and members of the GEOBON Secretariat. One of the early steps was to invite participants to nominate topics in which self-organising thematic working groups might be created. Six topics have already emerged with two or more members having put up their hands to progress the work: 1) ecosystem restoration; 2) marine-freshwater transitional ecosystems; 3) mountain aquatic ecosystems; 4) conservation planning and biodiversity forecasting; 5) molecular techniques; and 6) Indigenous knowledge and monitoring (Latest FWBON topics - GEO BON Discourse). If you have not yet become active on Discourse, please follow the instructions below from the GEOBON secretariat.

Purpose of Discourse community

The Discourse Community serves as a central hub for connecting, collaborating, and sharing insights with fellow GEO BON members who are passionate about biodiversity monitoring and conservation. It provides a space for meaningful discussions, knowledge exchange, and fostering a stronger sense of community among members. In particular, it enables discussion across multiple timezones, and allows participants to contribute in their language of preference. Language and time zones are major impediments to inclusion in Global communities of practice that could limit comfortable virtual interactions across the globe.

Discourse can also become a practical tool for FWBON members to progress their work, especially when global collaboration is desirable. In the short amount of time that the FWBON Community has been operational, there are already lots of ideas and resources contained in the discussions. FWBON members can now scroll through a long list of tags, select one (for example eDNA), read through the tagged posts and discussions, identify contributing FWBON members, and find out about relevant events and new publications. This could greatly facilitate tasks such as developing ideas for a new paper, assembling a team of co-authors, or finding partners for a funding application or a proposal for a special session at a conference.

Guide to Discourse community

Please follow this link and sign in through your GEO BON members account: http://discuss.geobon.org. You might need to reset your password. If you are not a GEO BON member yet, please create an account here. If you encounter any other problems with your account, please email web@geobon.org.

Introduce yourself:

Take a moment to introduce yourself by adding your picture and information to your profile. Share a bit about your background, interests, and what aspect of biodiversity monitoring and conservation you are most passionate about. Additionally, let the community know what specific topics or questions you'd like to be asked about. Don't forget to customise your notification settings for a personalised experience.

Explore the groups

The community is organised into groups, each dedicated to a specific Biodiversity Observation Network (BON), Working Group (WG), or Task Force (TF). To maximise your engagement, we encourage you to explore and request to join other groups that align with your interests and expertise beyond FWBON.

Get to know the community

Take some time to browse existing discussions within the communities. You are welcome to introduce new topics for discussion between members, and you are encouraged to add ‘tags’ to your post to make it easier for other members to find the topic. You may use the ‘heart’ reaction to show your appreciation or support for posts that you find interesting and informative. This will help build connections and foster a sense of camaraderie among community members.

Contribute

Actively participate in discussions by commenting, sharing your perspective, asking questions, or offering feedback. Before engaging, please review the Community Guidelines to ensure a positive and respectful environment for everyone.

FWBON members are encouraged to join any of the 26 Communities on GEOBON Discourse. Each community will operate in line with these community guidelines. At the same time, each community will have its own priorities, styles of working, and ways of structuring discussions and priorities taht should be followed. In the past 2 months, the FWBON Community has developed a unique character which is still evolving, and all members of the community have the right and responsibility to contribute to this evolution. The FWBON Discourse Community is

a place where everyone is encouraged to put forward new ideas and start new activities. It will work best and be more rewarding for all if everyone feels comfortable taking initiatives rather than waiting for someone else to take the first step. It is also important to seek synergies and connections. If you notice that there are several parallel discussions on closely related topics with only one or two contributors, don't feel shy to suggest merging these into a single topic or group. If you notice that a topic is becoming too broad and crowded to be useful, feel free to suggest splitting it into more manageable topics.

Feedback

If you have any questions, need assistance, or have suggestions for improvement, feel free to reach out in the Site Feedback community. Your input is extremely valuable as we work together to create a vibrant and collaborative space.

Languages supported

You can change your preferred language in the settings. Also note that the globe icon below each post will be able to translate the post in your selected language when you click on it. See the list of languages we support here: https://translate.geobon.org/

Discourse app

Download the Discourse Hub app from both Apple Store and Google Play, and access it from mobile devices as well as on your desktop.

Video tutorials:

1. Account creation: https://youtu.be/o-pGA8yTnGE
2. Communicating: https://youtu.be/Zab5aEEHeww
3. Translation feature: https://youtu.be/-8YxobCJ5dY

The China Inland Waters Fish Biodiversity Observation Network

Established in 2014, the China Inland Waters Fish Biodiversity Observation Network (CIWF-BON) is one of the affiliate observation networks of the SINO-BON and the first nationwide inland waters fish diversity observation network in China, and connected to FWBON. CIWF-BON aims to collect data on fish communities, populations, biology, early resources, genetic diversity, and habitat environments in the areas of eight principal river basins across the country, namely Yangtze River, Yellow River, Heilongjiang River, Pearl River, Lancang River, Nu River,



Figure 3: Artificial breeding and releasing of the Yangtze sturgeon in the Chishui River after the fishing ban. Credit: Pengcheng Lin



Figure 4: After the fishing ban, the fish resources significantly increased in Poyang Lake. Credit: Piao Hu

Tarim River and Qinghai Lake, designed in 25 sites and focused on 24 indicator species, such as Chinese sturgeon and four major Chinese carp species etc. Based on monitoring data (2012-2023), the effects of the fishing ban in the Chishui River were evaluated and the results indicated a significant recovery of fish resources after the fishing ban. Environmental DNA analysis in 2022-23 showed that Chinese sturgeon adults followed a distinct temporal rhythmfor movement: inhabiting deep pools during the summer months and entering the spawning grounds from August. In 2023, CIWF-BON sampled the more than one hundred fish species and collected about 4500 aquatic organism specimens and more than ten thousand data, which laid a good foundation for future scientific analysis.

More info can be found here: https://www.plantplus.cn/sinobon/cfibon
Contact details: *Xin Gao, Huanzhang Liu, Institute of Hydrobiology, Chinese Academy of Sciences, Wuhan, 430072, China. gaoxin@ihb.ac.cn.*

Fish monitoring in the Coles-creek, Prince Edward Island

This research emphasises the essential role of biological validation when formulating Environmental Flows guidelines. It centres on a small-scale watershed (Coles-creek), part of the North River, in Prince Edward Island (Canada). This watershed is primarily influenced by groundwater inflow and subjected to water abstraction pressures, resulting in low flow and elevated temperatures. The study spans eight years, from 2016 to 2023, encompassing the monitoring of pre- and post-water pumping periods. A comparative analysis was conducted between different sections of the same stream and with a paired reference stream unaffected by water abstraction, in which we examined the impact on local brook trout (*Salvenilus fontinalis*) populations. During this research, a pronounced reduction in summer stream flow was observed, surpassing recognized low flow thresholds (70% of median flow, or 70Q50, and 65% of median flow, or 65Q50) for water abstraction. Temperature consistently exceeded the optimal growth thresholds for the brook trout, eventually reaching levels of potential physiological stress. A substantial reduction in the length of the brook trout Young of the Year (YOY) coincided with the years 2020 and 2022, the lowest summer flows observed here. This evidence of potential stress was attributed to low flow and elevated temperature conditions. Despite these findings, no direct correlation was established between the local brook trout population's density or biomass and low flow conditions. Thus, at this stage, the seasonality effect should be considered since the complete growth period of brook trout influences the observed YOY growth trends. It is also essential to recognize the potential influence of other direct and indirect stress factors associated with low flow and high temperatures, including stream habitat loss, diminished stream productivity, land use impacts, and broader-scale climate change effects.

Contact details: *Bruno Carvalho Carneiro de Mendonca, Michael Van Den Heuvel & Andre St-Hilaire; Department of Biology, University of Prince Edward Island, Charlottetown, Canada. bmendonca@upei.ca.*



Figure 5: Field validation of inland water habitats at Sedgefield, Western Cape Province, South Africa. From left to right: Mr Kyle Smith (SANParks), Dr Anthony Campbell (NASA), Dr Atticus Stovall (Univ), Mr Pati Thakali (University of the Witwatersrand), Mr Petri Oberholster (volunteer from University of the Free State) and Ms Larize Nel (volunteer).

NASA Bioreach airborne campaign assessed the capabilities of improved mapping of blue carbon habitats in South Africa

The IUCN classifies estuaries and freshwater (rivers and inland wetlands) ecosystems under the 'inland waters' realm of the new global ecosystem types (Keith et al., 2022). Changes in the extent of inland waters would have to be reported by CBD members under Goal A of the GBF by 2030. In South Africa, changes in the extent of habitats associated with inland waters remain to be assessed. Land cover data show some levels of transformations, however, doesn't capture the true extent or seasonal variation of the ecosystem types. For estuaries, changes in the extent of blue carbon habitats can contribute to biodiversity typing, monitoring and reporting. To date, <43% of the 290 Estuarine Functional Zones (EFZs) and <10 of the 42 micro-estuaries have been digitised by various ecologists in the country (Van Deventer et al., in review). A recent assessment where multi-seasonal images from space-borne Landsat and Sentinel-1 and -2 at a 30-m and 10-m spatial resolution, respectively, showed that finer spatial and spectral resolution images would potentially improve on mapping these small, fragmented habitats.

In 2023, the National Aeronautics and Space Administration (NASA) funded an aerial campaign flying four sensors from October to November 2023 on two aerial platforms acquiring a countless number of remote sensing images for the monitoring of biodiversity in the Western Cape Province of South Africa. The campaign was overall called the NASA Bioscape campaign (see bioscape.io) and resulted from discussions that commenced > 7 years ago. The campaign was primarily focused on the biodiversity of the Cape floristic region with 23 sub-projects focused on various realms and biomes. One of these, is the NASA Bioreach subproject, led by Dr Anthony Campbell from NASA. The aim of this subproject is to map plant functional types and key species across major estuaries in the Western Province. Several South African institutions are participating in Bioreach, ranging from science councils to universities and the conservation agency: the South African National Parks (SANParks). Field validation of the blue carbon habitats, and adjacent, ecotonal freshwater reedbeds, were done in collaboration with SANParks at the Langebaan and Sedgefield estuaries, collecting information on species composition, above-ground biomass and sediment samples. The output habitat maps are in development and expected to greatly contribute to improved



Figure 6: The homogeneity of the salt marsh in the front (Juncus kraussii) and the reeds (Phragmites australis) at the Swartvlei wetland at the time of the field campaign. Submerged macrophytes are visible between the lake water on the far right.

understanding of the ideal spatial and spectral resolution required for monitoring and reporting of inland waters in the Global South.

Contact details: *Heidi van Deventer, Anthony Campbell and the NASA Bioreach team members and collaborators (HvDeventer@csir.co.za)*

Freshwater related publications

If you are interested in freshwater related publications, either in sharing or in reading, we have established a topic on Discourse here: https://discourse.geobon.org/t/new-publications/

News relevant to FWBON members

- Africa

  In May 2024 we will start with engagement meetings to discuss ongoing research and concerns related to inland waters on the African continent. We have meetings planned for the first Friday of every month, for 11:00-12:00 SAST. Our first meeting will discuss the FWBON strategy, the Discourse platform, then taking time for a meet-and-greet of all attending members, and then planning future meetings. Subsequent meetings will have a speaker, discussions and follow-up on previous discussions.

Outlook and feedback request

We hope you found this Newsletter informative. We aim to distribute this Newsletter in regular intervals, with the purpose to improve communication within FWBON. Effective communication will be increasingly critical to work towards our goals.

We appreciate any comments or suggestions you may have and will try to implement them in the upcoming issues of the FWBON Newsletter. We encourage you to suggest topics to be featured, provide contributions, and

indicate which news you consider relevant to our FWBON network. Please feel free to contact your regional coordinator to share information, feedback, and to hear about ongoing initiatives.

Find us on ResearchGate:
https://www.researchgate.net/project/Freshwater-Biodiversity-Observation-Network-FW-BON
Follow us on Twitter: https://mobile.twitter.com/fwbon1
Discuss with us on Discourse: https://discourse.geobon.org/c/fwbon/

FWBON Freshwater Biodiversity Observation Network

Newsletter Imprint

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