

Hydroclimate Signals Presentation: Brainstorming

With the present document, we would thus like to collect input from all workshop participants to include into an introduction talk concerning the main and/or most robust signals of centennial hydroclimate variability in the proxy record.

If you have more extensive material (slides, videos, etc) you can send it by email to the organizers of this presentation:

- Alyssa Atwood: aatwood@fsu.edu
- Matthew Jones: Matthew.Jones@nottingham.ac.uk
- Nikita Kaushal: nikitageologist@gmail.com

Please indicate your name and email below when you contribute.

1. Hung Nguyen: hnguyen@ldeo.columbia.edu
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Streamflow signals in the tree ring records (both ring width and cellulose $\delta^{18}\text{O}$). High resolution (monthly) streamflow reconstruction, Centennial variability in annual streamflow reconstructions. Centennial variability in teleconnection with ENSO.

2. Jialin Lin: lin.789@osu.edu

Droughts and Mega-droughts, including centennial variability and AMO based on a recent paper <https://www.tandfonline.com/doi/full/10.1080/07055900.2022.2086848>

3. Ezgi Ünal İmer e.unalimer@gmail.com

The changes in moisture source and effective moisture gathered from speleothem records (proxies: high resolution (centennial-decadal-scale) stable isotope and trace element profiles) Linked papers can be from Kocain Cave (SW Turkey) <https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2021GL094733> and Dim Cave (S-SW Turkey) <https://www.nature.com/articles/srep13560>

4. Kathryn Allen Kathryn.Allen@utas.edu.au

Use of remote proxies for hydroclimate (specifically precipitation and streamflow) can be problematic for some regions (e.g. southern Australia) if not carefully considered. Attention to signal variation with respect to season and geography important - perhaps more so for highly resolved (e.g. annual) proxies.. Synoptic-scale factors and large-scale factors such as Hadley cell (etc) important - in addition to modes (and their interactions) such as ENSO, SAM, IOD, SAM (manuscript in prep)

5. Ed Hathorne (ehathorne@geomar.de)

How can we understand and quantify uncertainty when using surface seawater oxygen isotopes recorded by proxy carriers like planktonic foraminifera and corals? In places such as the Bay of Bengal the factors affecting the $\delta^{18}\text{O}$ of precipitation are complex and the relationship between seawater $\delta^{18}\text{O}$ and salinity is dynamic in space and time. With additional secondary influences on the $\delta^{18}\text{O}$ of proxy carriers it is remarkable these proxies consistently produce realistic variability reflecting hydroclimate.

6. Vladimir Matskovsky (matskovsky@gmail.com)

Upgrade of European Russia tree-ring data set for future hydroclimate reconstructions (including PDA)

We are permanently updating European Russia tree-ring data set (doi:10.1038/s41597-022-01456-6) previously used for European Russia Drought Atlas reconstruction (<https://doi.org/10.1007/s00382-019-05115-2>). We are also experimenting with new methods for the update of this reconstruction (AI-based and updated point-by-point regression, manuscript in preparation). We also want this dataset to be used in paleoclimate data assimilation (PDA) reconstructions and are willing to participate with the state-of-the-art data from the region.

7. Narayan Gaire (npgaire2007@gmail.com)

Tree-ring from Himalayan region can be used for river basin (watershed) level streamflow or regional drought/precipitation reconstructions. Unlike temperature, precipitation and droughts have region specific patterns. Therefore, analyzing teleconnections and mechanisms of influence in regional hydro-climate could be interesting. <https://doi.org/10.1016/j.jhydrol.2022.127801> ; <https://doi.org/10.1016/j.palaeo.2018.10.026>

8. Cecile Blanchet (blanchet@gfz-potsdam.de)

Also pasted on the other google doc (centennial variability):

Might be worth joining work with the floods PAGES group? I am working on flood reconstructions (from varved records) and I guess there is quite some info there.

Also, some of the discussions in the CVAS group for "non-calibrated" proxies was on how to use the chronological information, xrf, grain-size data, varve thickness (etc) to explore

variability (not answered! ;). On my side, the contribution would be from the VARDA database (<https://varve.gfz-potsdam.de/>) and our expertise with dealing with xrf data + varved records. Our research is also very much centered on hydroclimates so would be happy to contribute!