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MODIS/VIIRS Global Water Reservoir (GWR) Product

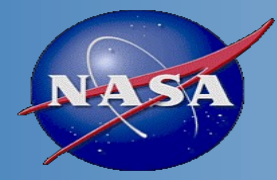
PI: Huilin Gao¹

Acknowledgement:

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Sudipta Sarkar³, Carol C Davidson³, Rui Zhang⁴, Maosheng Zhao^{3,5}, and Sadashiva Devadiga⁵

¹. Texas A&M University, ². Carnegie Institution for Science, ³. Science Systems and Applications Inc, ⁴. Global Science & Technology Inc, ⁵. NASA GSFC

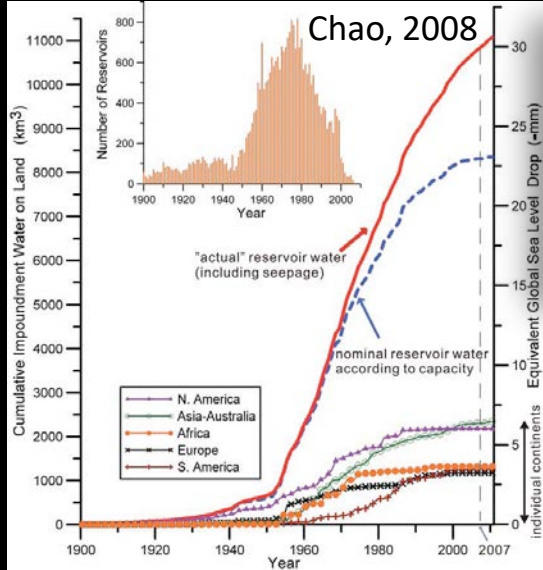
MODIS/VIIRS Science Team Meeting
May 3, 2023



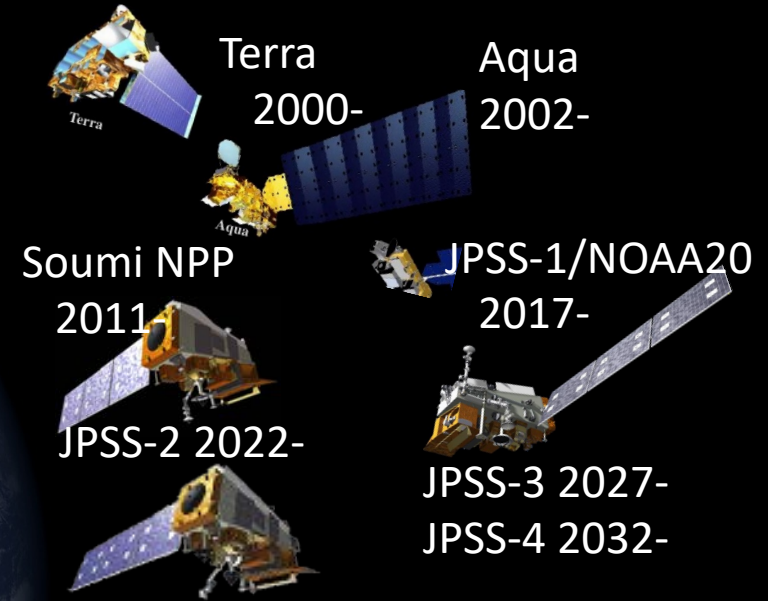
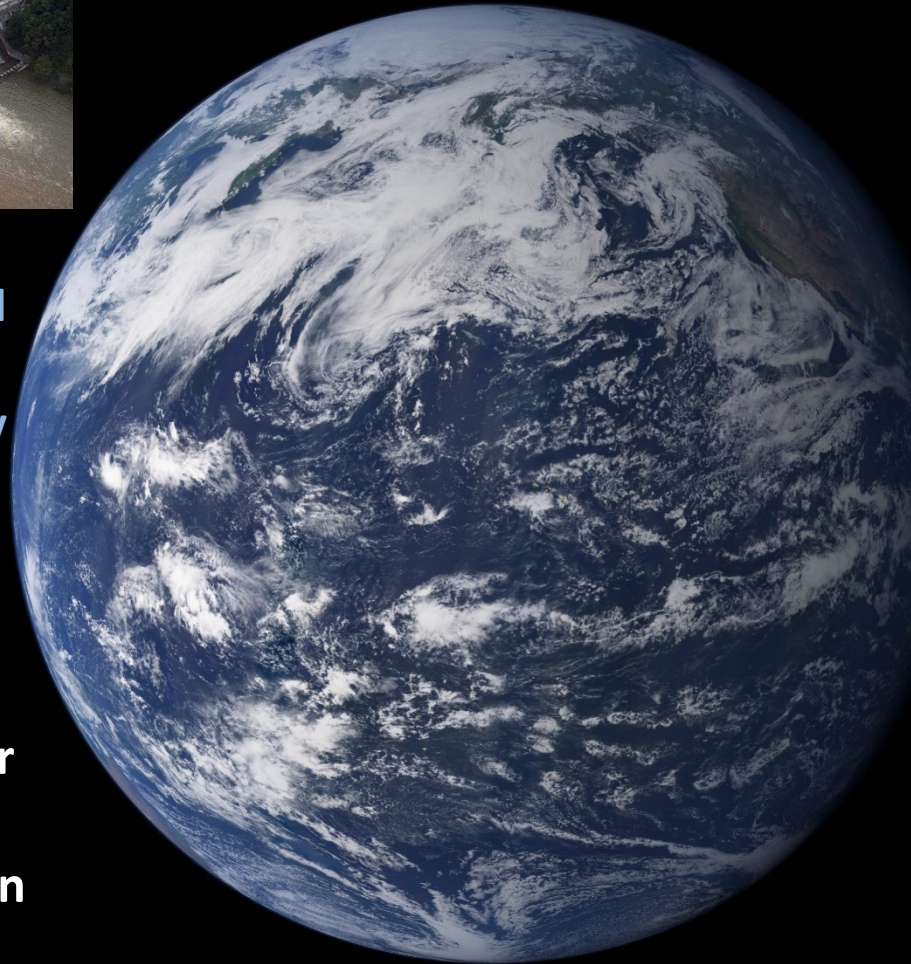
Why MODIS/VIIRS Global Water Reservoir (GWR) Product?



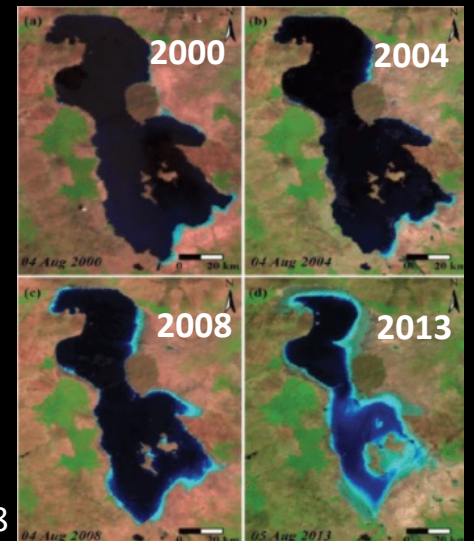
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**Hydropower
Flood control
Irrigation
Water supply**

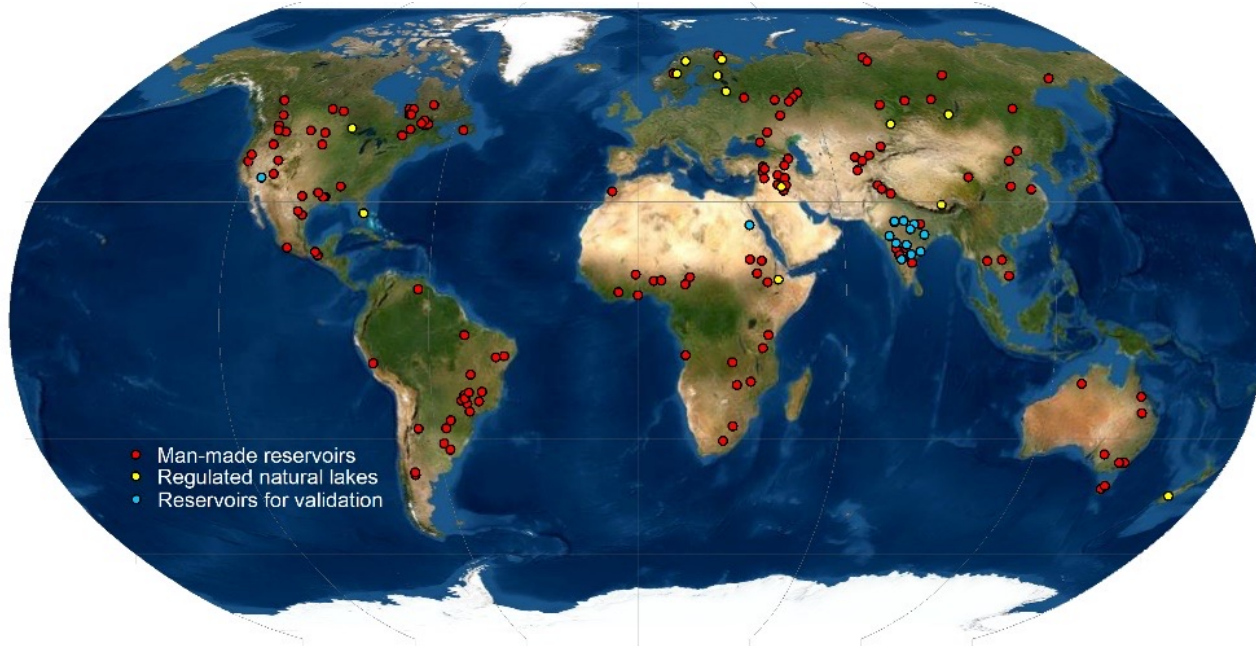


MODIS images of Urmia Lake



- Reservoir storage can be inferred using surface reflectance classifications (Gao et al., 2012)
- Reservoir evaporation can be better estimated using LST (Zhao et al., 2020)
- Simultaneous storage & evaporation observations can provide comprehensive monitoring capability

Figure from Mohebzadeh, 2018



Locations of the 164 reservoirs (46% global capacity)

Key inputs:

8-day reflectance, Monthly LST

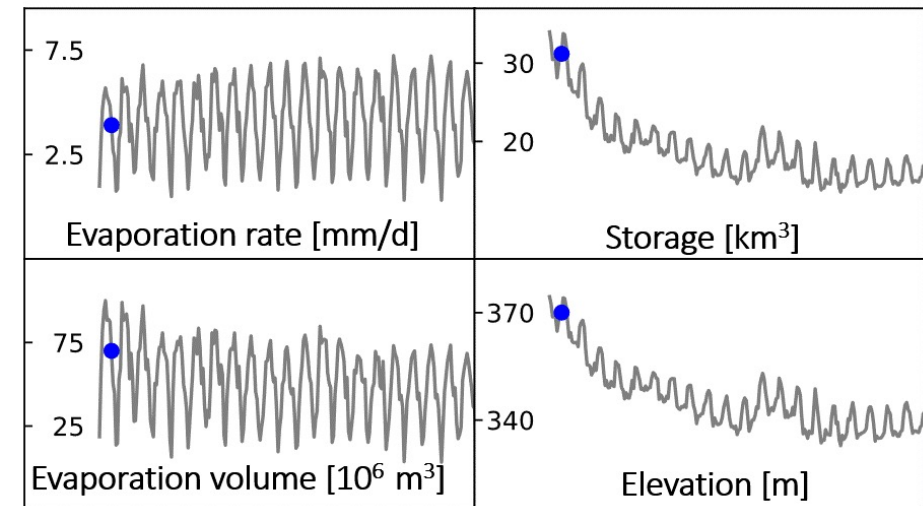
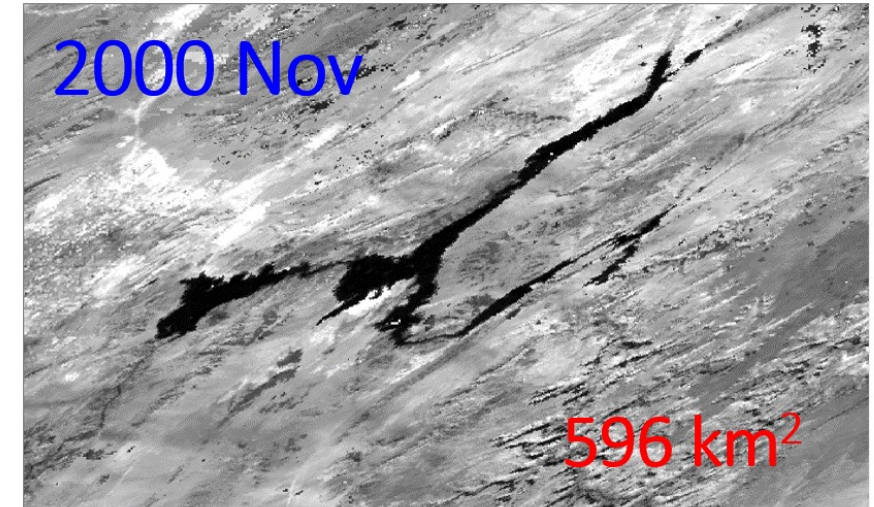
| Temporal Resolution | Variables |
|---------------------|---|
| 8-day | Area, elevation, storage |
| Monthly | Area, elevation, storage, evaporation rate and volume |

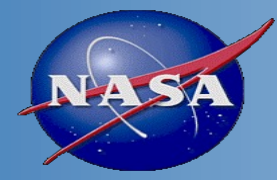
| Product name | Period |
|---------------------------|-----------|
| MxD28 ¹ (C6.1) | 2000-2023 |
| VNP28 ² (C2) | 2012-2023 |
| VJ128 ² (C2) | 2018-2023 |

¹ Released in 2021

² To be released in 2023

Lake Mead (ID: 61)



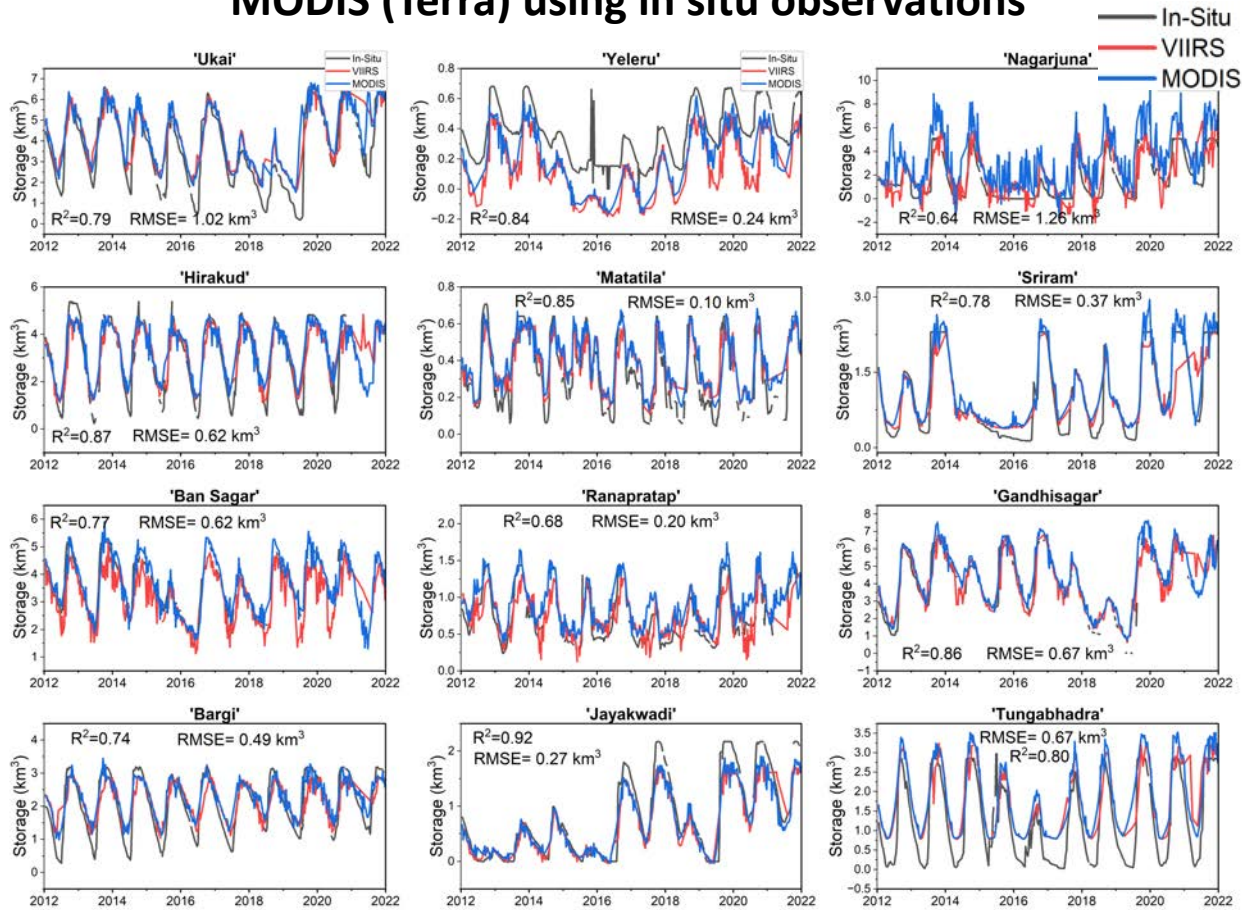


MODIS/VIIRS GWR Product Validation and Continuity

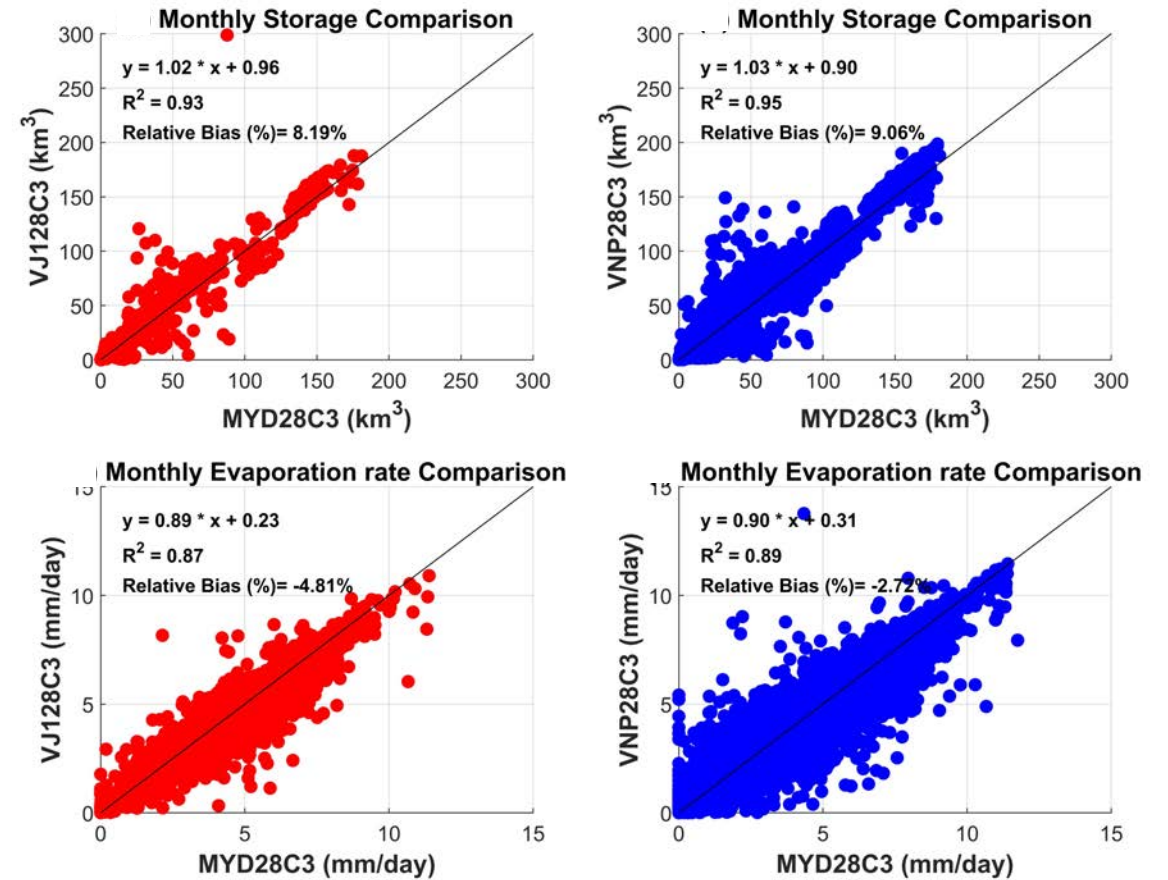


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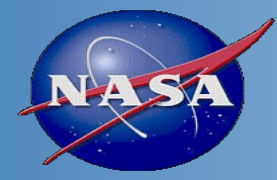
Validation of the 8-day storage data from VIIRS (SNPP) and MODIS (Terra) using in situ observations



Continuity of the monthly storage and evaporation rate VJ1 v.s. MYD



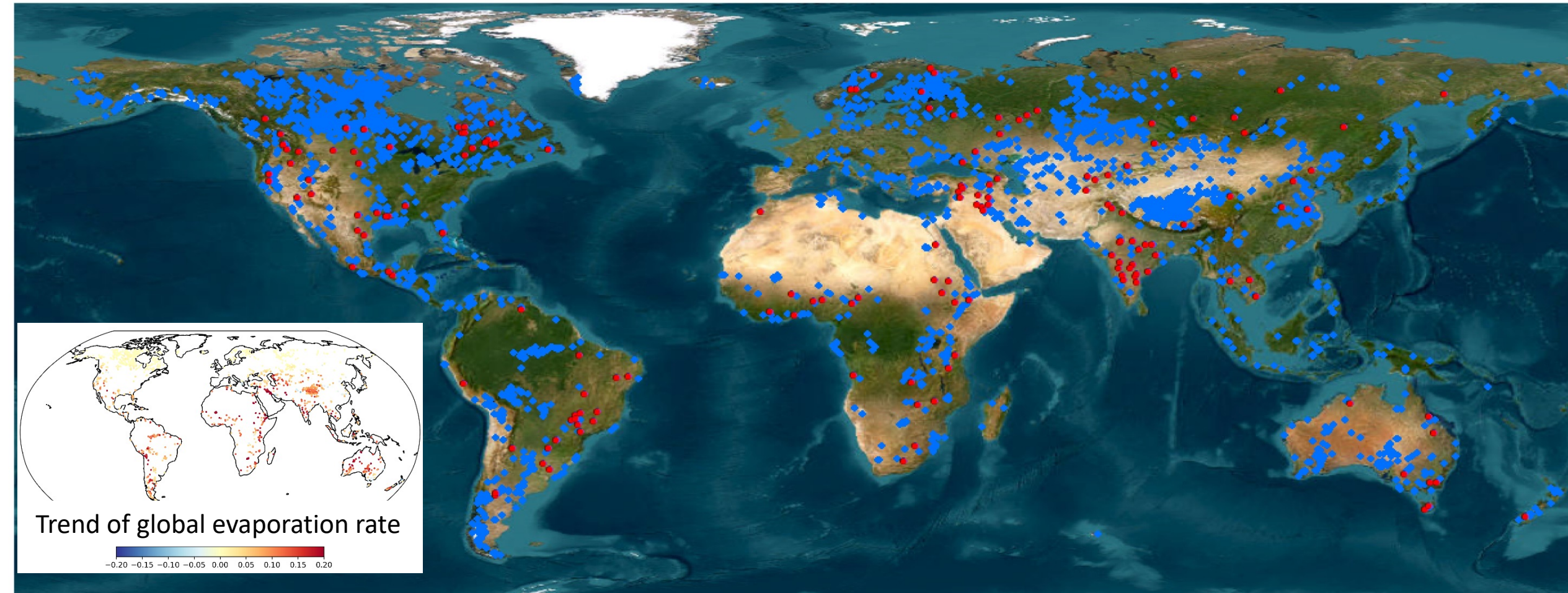
More results are provided in the poster "On the Continuity of MODIS and VIIRS Based Global Reservoir Products" by Gao et al.



Understanding the Long-term Dynamics of Global Lake/Reservoir Storage and Evaporation



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GWR product

- 164 reservoirs
- Accounting for 46% of the global reservoir capacity

Extended lake/reservoir dataset (2000-2022)

- 2338 natural lakes and 397 reservoirs
- Accounting for 71% of the total lake surface area, and 98% of the global reservoir capacity