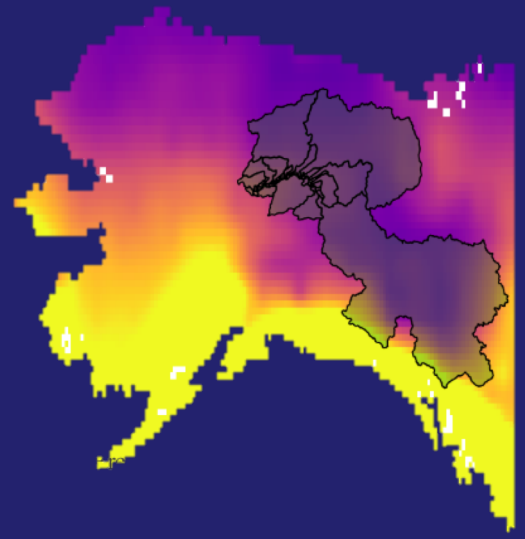
RaBPro: A Module for Profiling Rivers and Basins



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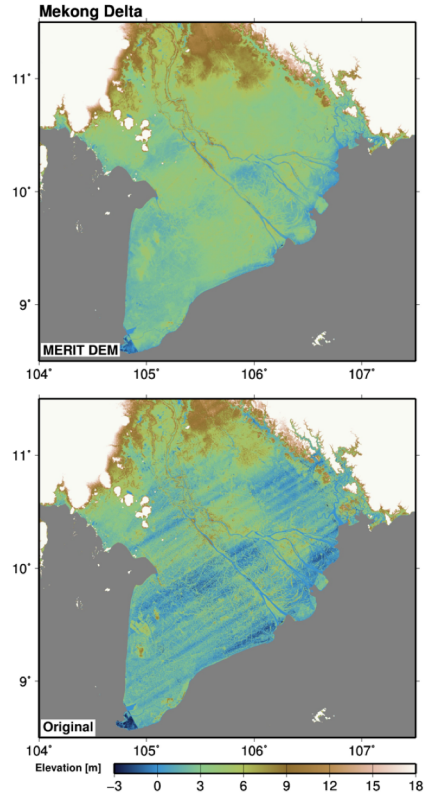
DEMS AND GLOBAL DATASETS

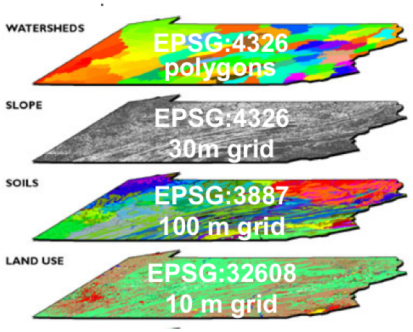
- Digital elevation models (DEMs) represent terrain using elevation data
- Recent advancements have led to global elevation data
- Similarly, satellite imaging and large-scale modelling have led to numerous near-global data sources for watershed characteristics

- Need global-scale tools to feed data to models
- Scale of new datasets poses new challenges



Source: MERIT DEM

Google Earth Engine



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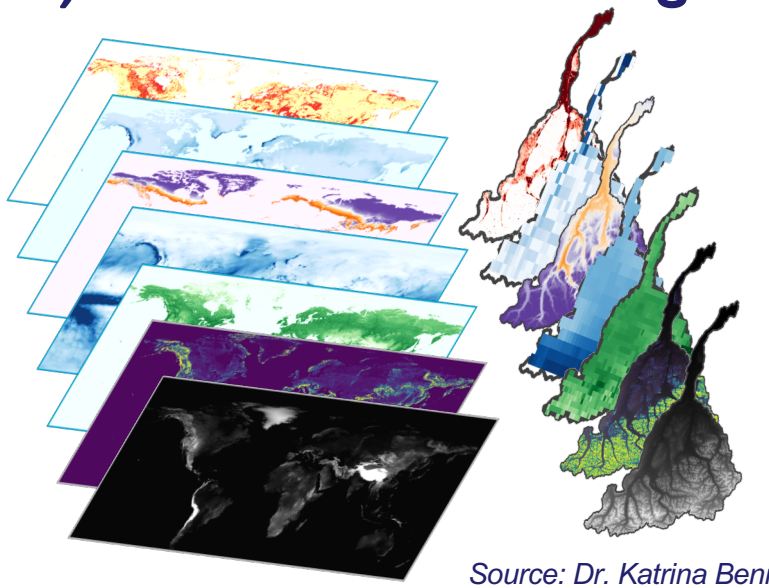
RaBPro: River and Basin Profiler

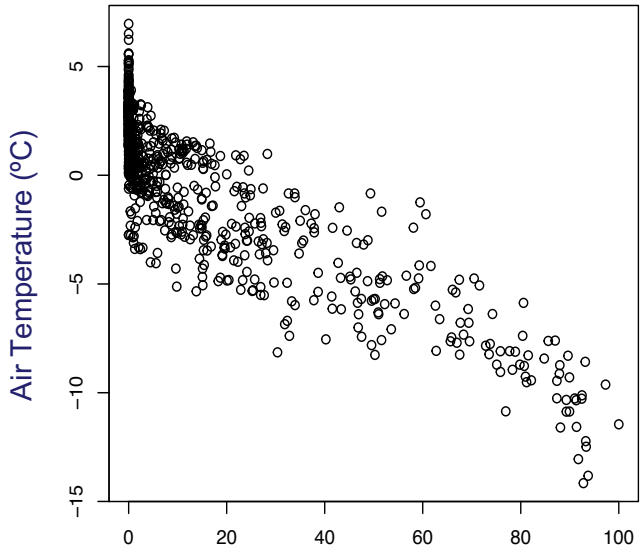
- Delineating basins and computing watershed stats across datasets become expensive
- RaBPro (River and Basin Profiler) is a Python module providing a pipeline to
  - delineate drainage basins
  - create elevation profiles
  - calculate watershed statistics
- Use Google Earth Engine (GEE) for fast and low-storage computation



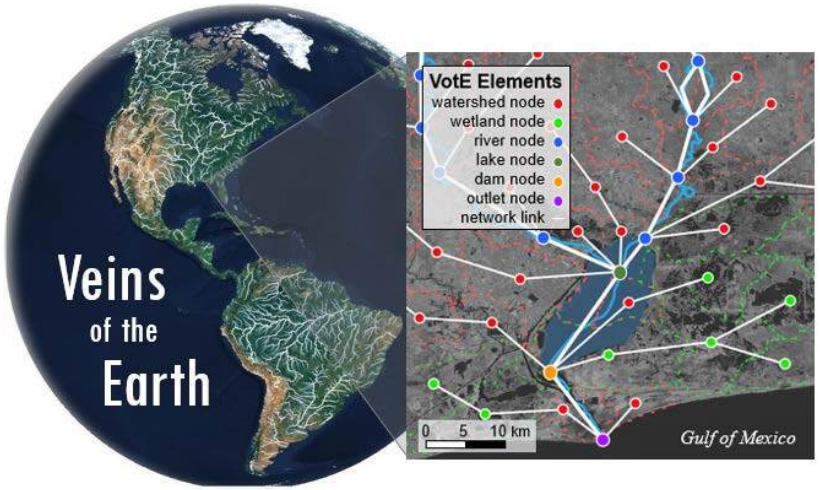
Source: Dr. Katrina Bennett

APPLICATIONS

- Permafrost hydrology: Investigating how Arctic permafrost and precipitation characteristics affect river processes
- Veins of the Earth (VotE): framework for mapping and modelling river networks on a global scale
- Many more!



Obu et al. 2019 Permafrost (%)
Source: Dr. Katrina Bennett



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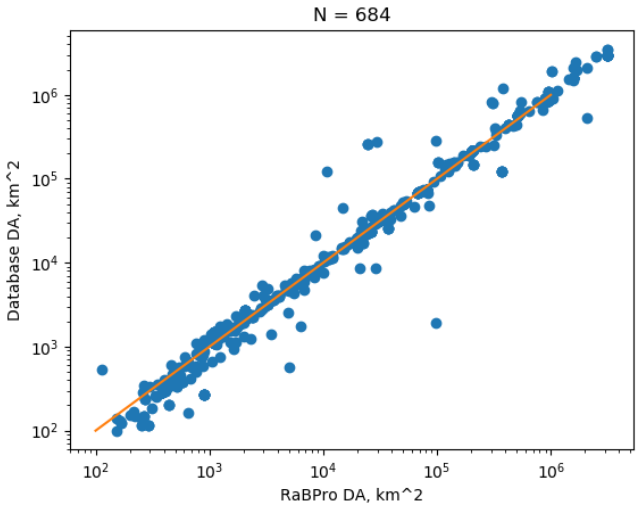
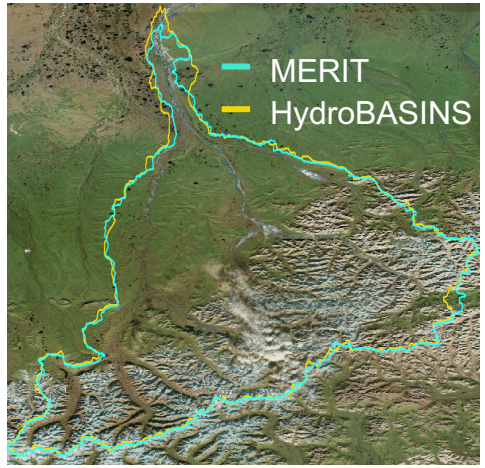
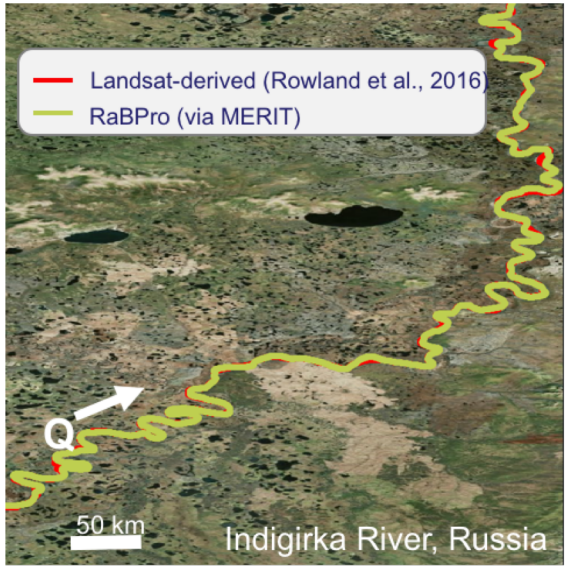
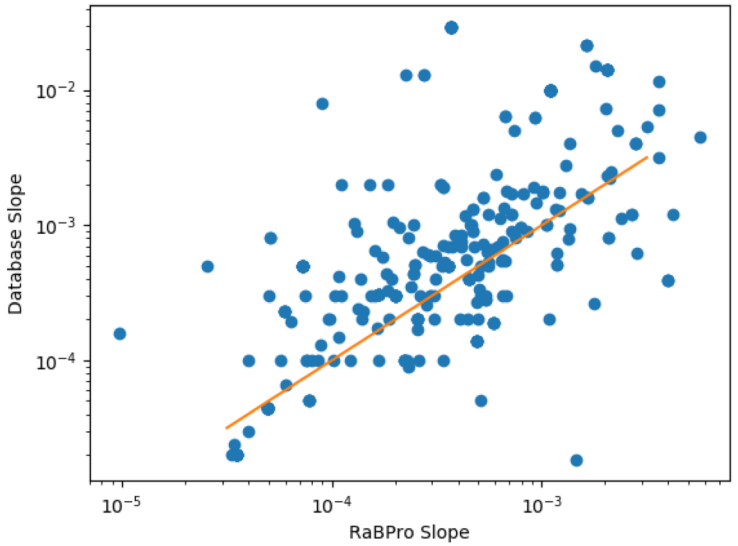
OUTPUTS





Sag River Basin,
~14,900 km^2





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CONCLUSIONS & ACKNOWLEDGEMENTS

- RaBPro is a module for analyzing watersheds, with several demonstrated applications.
- Available for installation through Pip and Anaconda.
- GitHub: https://github.com/jonschwenk/rabpro
- Questions: tz2294@columbia.edu

- Many thanks to Dr. Jemma Stachelek and Dr. Katrina Bennett for their contributions!

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