*[Water Resources Research]*

Supporting Information for

**Bankfull and Mean-flow Channel Geometry Estimation through a Hybrid Multi-Regression and Machine Learning Algorithms across the CONtiguous United States (CONUS)**

Reihaneh Zarrabi1, Riley McDermott1, Seyed Mohammad Hassan Erfani2,3, and Sagy Cohen1

1Department of Geography, University of Alabama, Shelby Hall 2021, Tuscaloosa, AL, 35487.

2Center for Climate Systems Research, Columbia Climate School, Columbia University, New York, NY, 10025.

3NASA Goddard Institute for Space Studies, New York, NY, 10025.

**Contents of this file**

Text S1

**Text S1.**

In this study, we improved the quality of the HYDRoSWOT dataset by applying various filtration techniques. Subsequently, we utilized the interquartile range (IQR) method to automatically identify breakpoints in width/depth ratio versus discharge plots. This method serves as a quantitative indicator of bankfull condition, as suggested by Keast and Ellison (2022). Through our analysis, we identified three main patterns in width/depth ratio versus discharge plots: a) No overbank observations b) Only one overbank observation c) Multiple overbank observations. We selected four USGS sites per each pattern, as illustrated in **Figure S1**, to demonstrate the method's ability in identifying observations closest to the bankfull condition within each site.