Introduction

Drought-flood transitions across different hydro-climates

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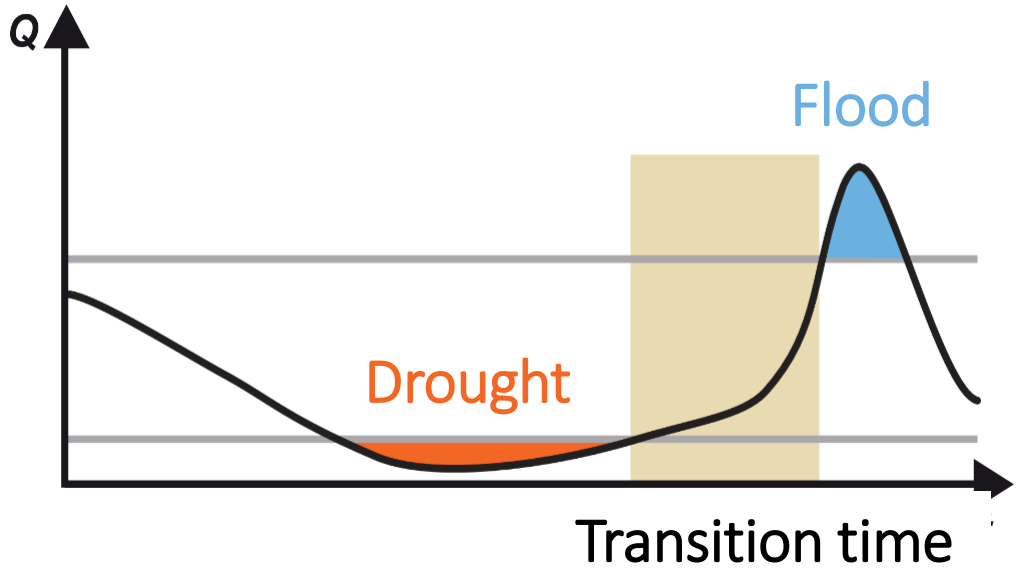
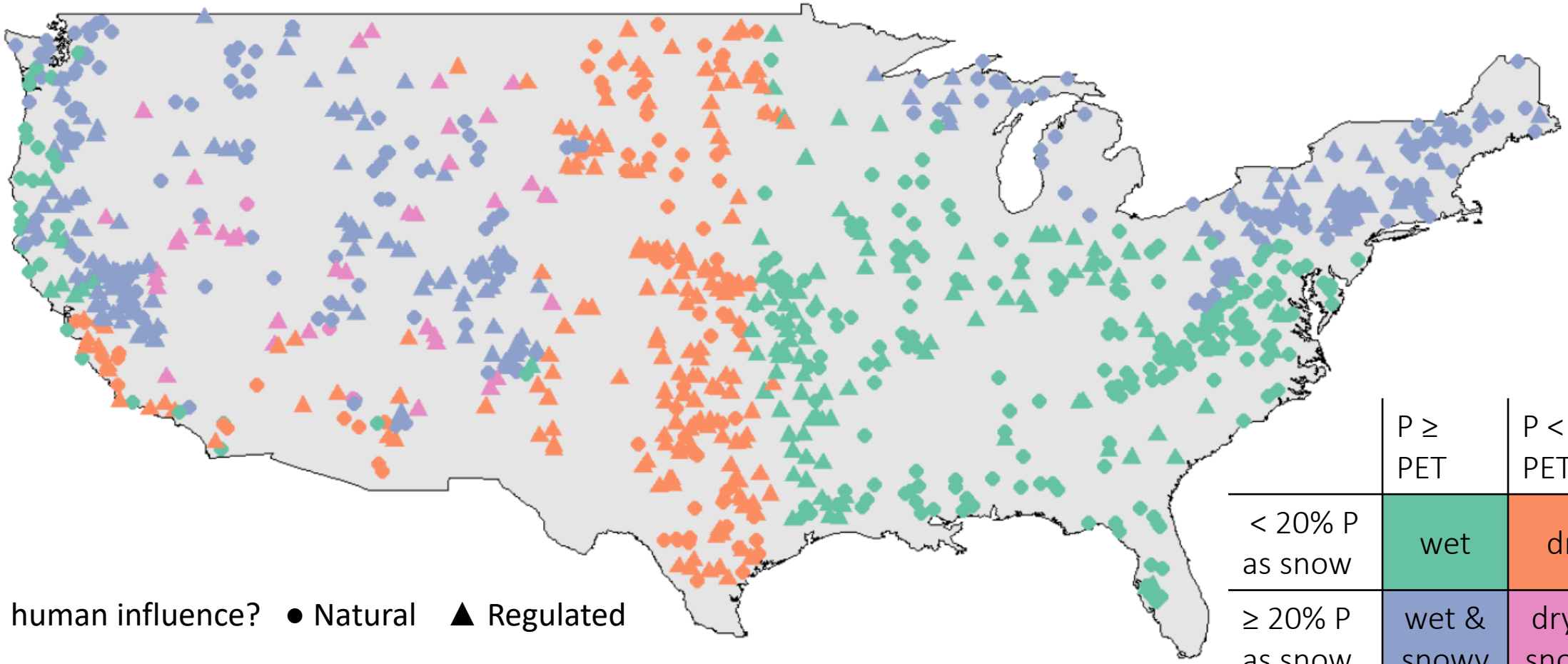


Where do rapid drought-flood transitions occur?



	P ≥ PET	P < PET
< 20% P as snow	wet	dry
≥ 20% P as snow	wet & snowy	dry & snowy

Data:

- streamflow data, catchment & climate characteristics

  (Dudley et al. (2018), Ryberg et al. (2019) & Falcone (2011))

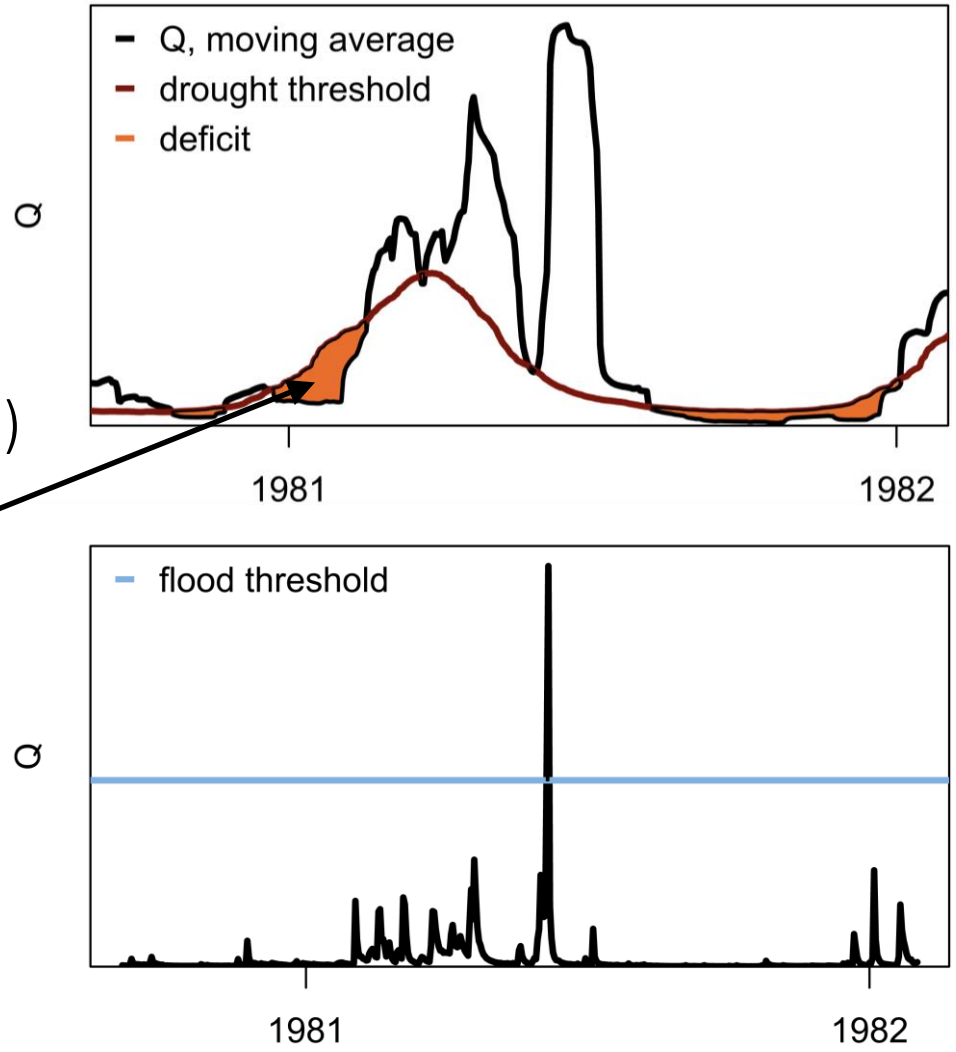
- chosen obs. period: 01/1970 – 04/2022

Droughts:

- variable threshold approach (15th percentile)
  - min. duration: 30 days
  - min. 1% deficit of yearly Q volume

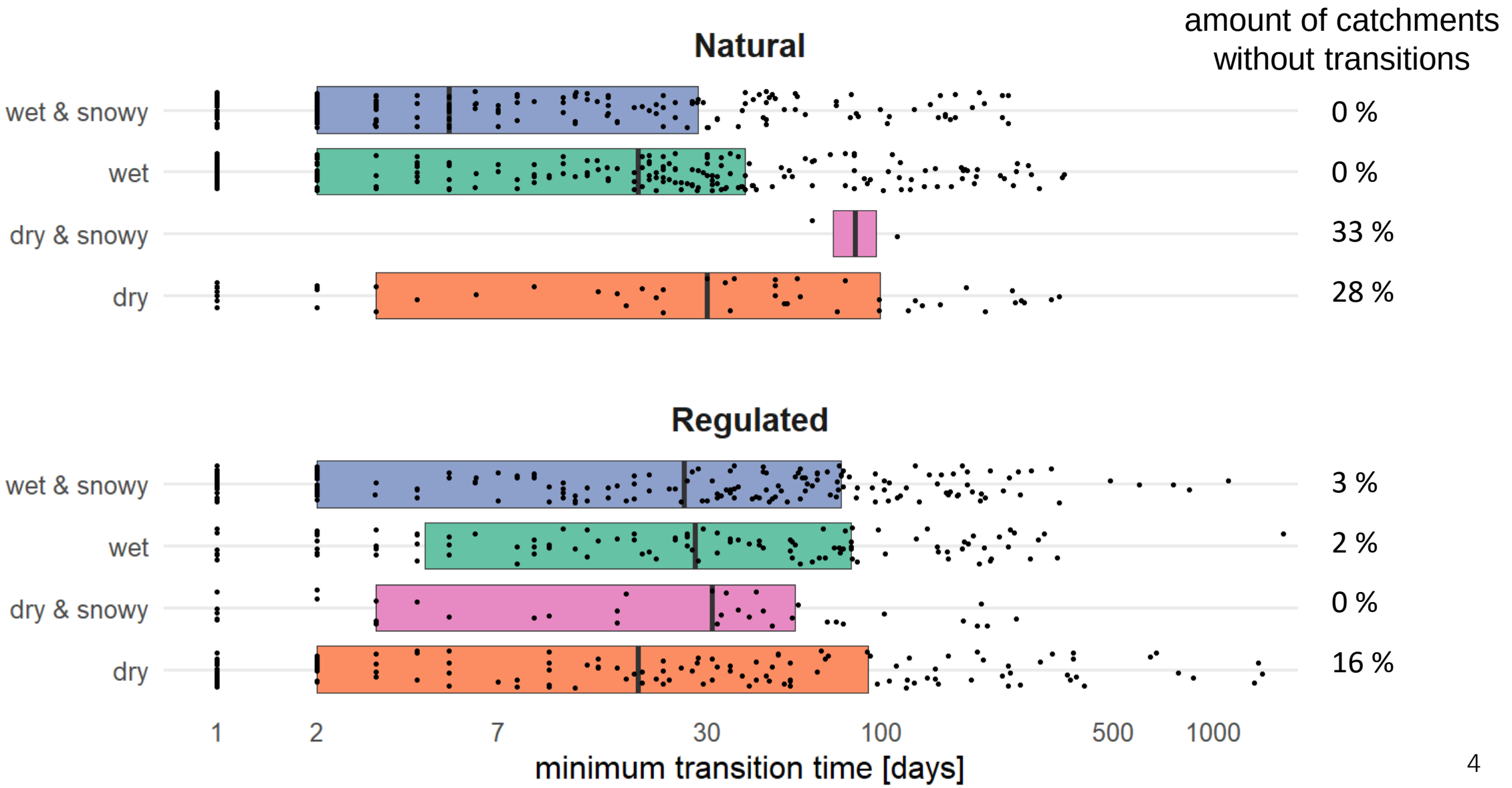
Floods:

- Q > 50th percentile of yearly maxima

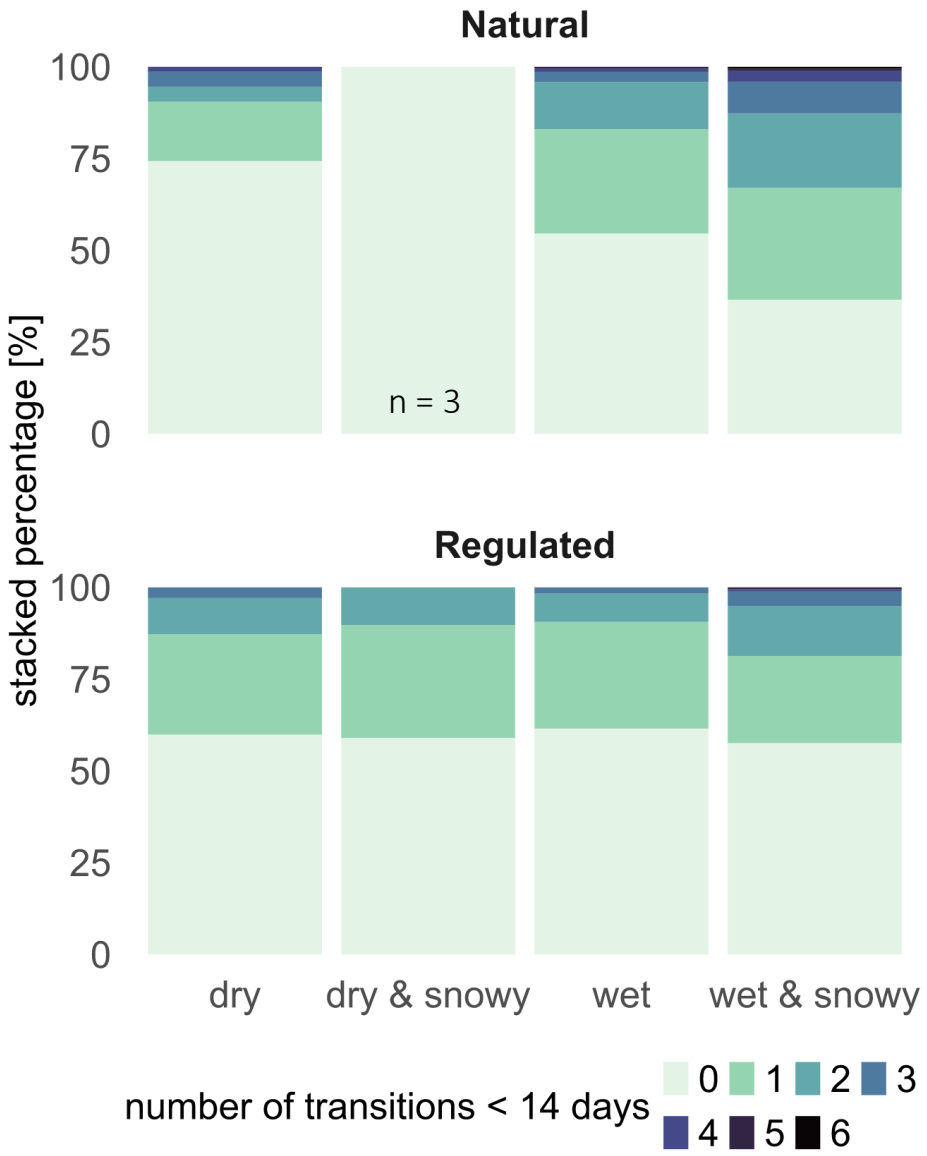


Shortest transition time per catchment

Results (1)



Short transitions (< 14 days)



Natural catchments:

- More rapid transitions in wetter and snow-dominated catchments

Regulated catchments:

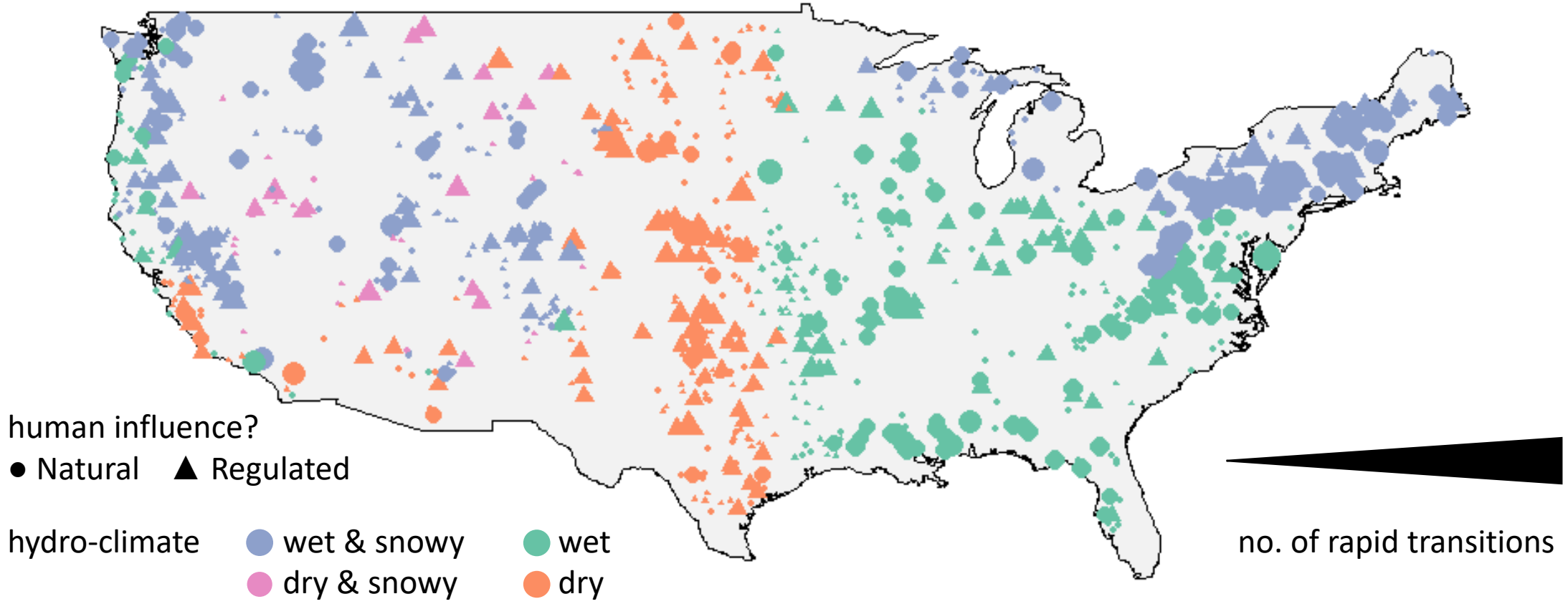
- Similar amount of rapid transitions across all hydro-climates

=> Less rapid transitions in wet & snowy hydro-climate compared to non-regulated catchments

Results (2)

Conclusion

Rapid drought-flood transitions can occur across all hydro-climates, **but occur more often in snow-dominated and wet catchments.**



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References

- Falcone J A (2011): GAGES-II: geospatial attributes of gages for evaluating streamflow. Digital spatial data set 2011 (available at: https://water.usgs.gov/GIS/metadata/usgs wrd/XML/gagesII_Sept2011.xml)

- Ryberg K R, Hodgkins G A and Dudley R W (2019): Change points in annual peak streamflows: method comparisons and historical change points in the United States J. Hydrol. 583 124307

- Dudley R, Archfield S, Hodgkins G, Renard B and Ryberg K (2018): Peak-streamflow trends and change-points and basin characteristics for 2,683 U.S. Geological Survey streamgages in the conterminous U.S. (available at: https://www.science base.gov/catalog/item/5b183960e4b092d965219d62)