Understanding Atmospheric Rivers in a Future, Warmer Climate

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INTRODUCTION

- The climate is warming
- As temperatures increase, atmospheric water vapor also increases due to the Clausius-Clapeyron relationship
- Atmospheric rivers (ARs) transport large amounts of water vapor
- How will climate change impact ARs?

METHODS

- AR case study dates were identified using ncview
- Plots of ARs were created using data from the Atmospheric River Tracking Method Intercomparison Project (ARTMIP)
- To help with the development of code, took introductory courses to NCL and Python

RESULTS

- RCP 8.5^ plots depict increases in AR size and Integrated Vapor Transport (IVT) values in future ARs compared to ARs detected using MERRA v2 and historical climatology^

^Caveat: plots are case studies, do not represent means and trends

CONCLUSIONS

- ARs play an important role in transporting large amounts of water vapor to regions across the globe
- Due to the Clausius-Clapeyron relationship and increasing temperatures, future ARs could potentially transport more water vapor
- AR intensity and size depends on the type of algorithm being used

FUTURE WORK

- Move away from case studies and utilize entire ARTMIP datasets to identify means and trends in future ARs
- Analyze characteristic differences between historic and future ARs

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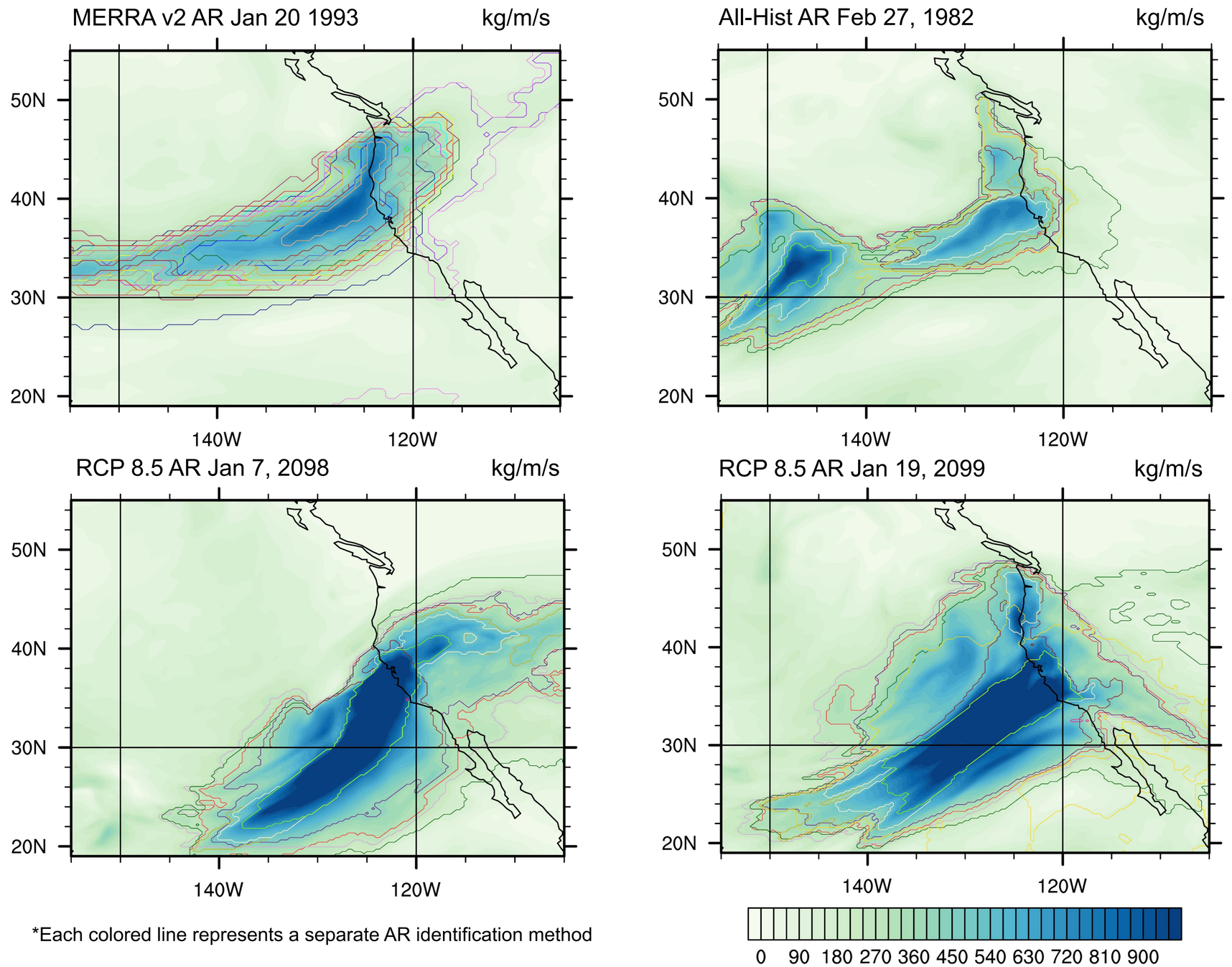
Atmospheric river size and intensity **depends** on the type of detection **algorithm used.**



*Each colored line represents a separate AR identification method