

# A Comparison of Atmospheric River Catalogs in the Northeastern United States

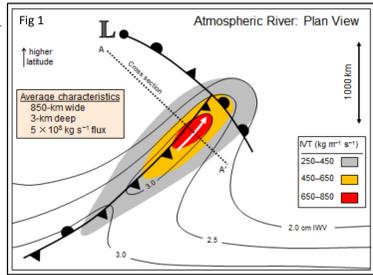


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## Introduction

The American Meteorological Society Glossary defines an AR as “A long, narrow, and transient corridor of strong horizontal water vapor transport that is typically associated with a low-level jet stream ahead of the cold front of an extratropical cyclone.” The purpose of this study is to compare a subjectively identified catalog of ARs over the Northeast U.S. constructed during a Summer 2018 REU project (i.e., the Duncan catalog) to a published objectively identified catalog of ARs by Bin Guan (UCLA/JPL; i.e., the Guan Catalog).

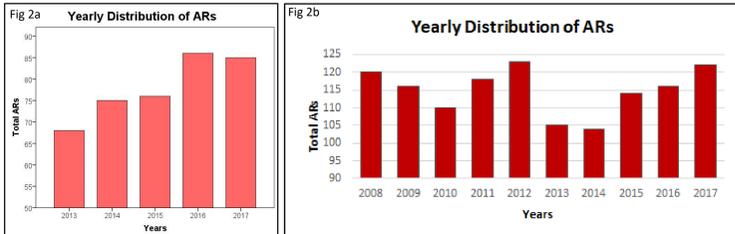


The subjective identification of atmospheric river events over the Northeast US is more accurate than published objectively identification methods

## Methodology

The Bin Guan Catalog included a center point, equatorward point, and poleward point. The midpoint for each of the three points were calculated in order to determine the location of 6 new points along the AR for a total of 9 points that describe the location of the AR. If one or more points were located in domain the AR was included in the dataset.

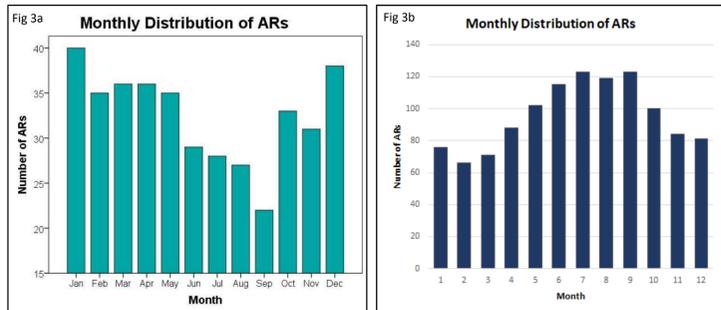
## Yearly Distribution



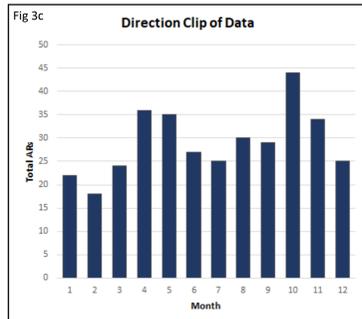
- Figure 2a represents the yearly distribution of ARs calculated by the Duncan Catalog
- Figure 2b represents the yearly distribution of ARs calculated by the Bin Guan Catalog.

- The Bin Guan Dataset has a significantly larger yearly AR totals.

## Monthly Distribution

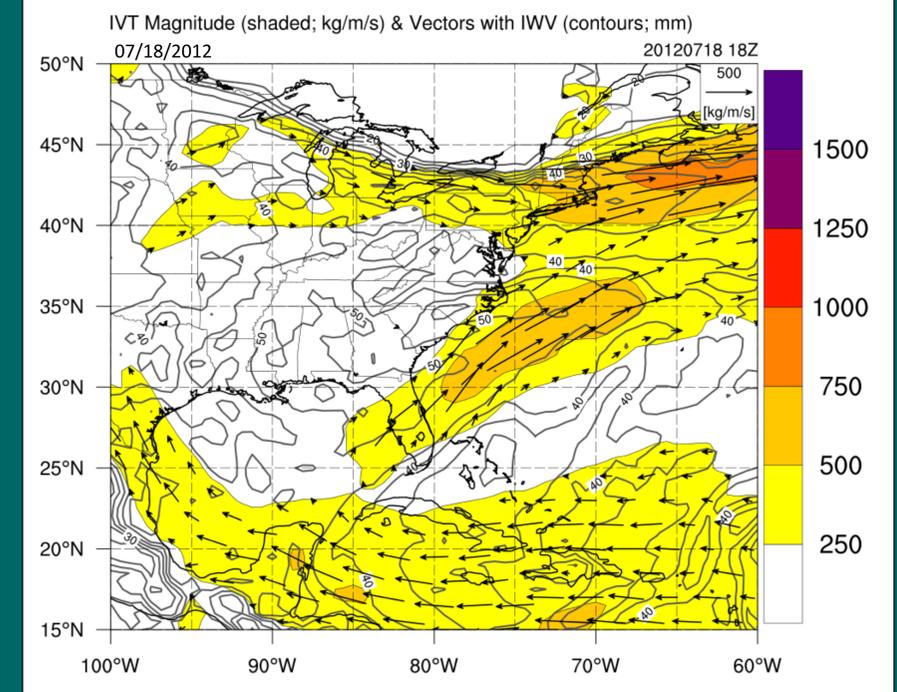


- Figure 3a represents the monthly distribution of ARs calculated by the Duncan Catalog
- Figure 3b represents the monthly distribution of ARs calculated by the Bin Guan Catalog.



- Figure 3b has a significantly larger number of ARs in the summer months, while the winter months are comparable.
- In order to eliminate non AR events, the tilt of AR was limited to southwesterly flow (Fig. 3c).
- Figure 3c is more comparable to the Duncan catalog than the data in figure 3b, but does not correctly represent the data.
- The Bin Guan Catalog incorrectly identifies general IVT flux around the Bermuda High as Atmospheric Rivers

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Objective routines incorrectly identify zonal IVT over Great Lakes and meridional IVT around the Bermuda high as atmospheric rivers.