A Climatology of Lake Breezes at O'Hare International Airport

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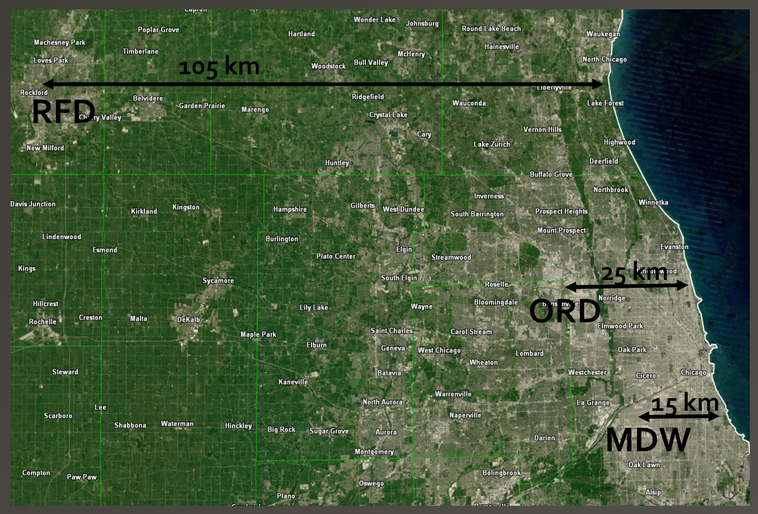
Background

- Lake breezes are complicated!
- 3 main assumptions
- ORD configuration



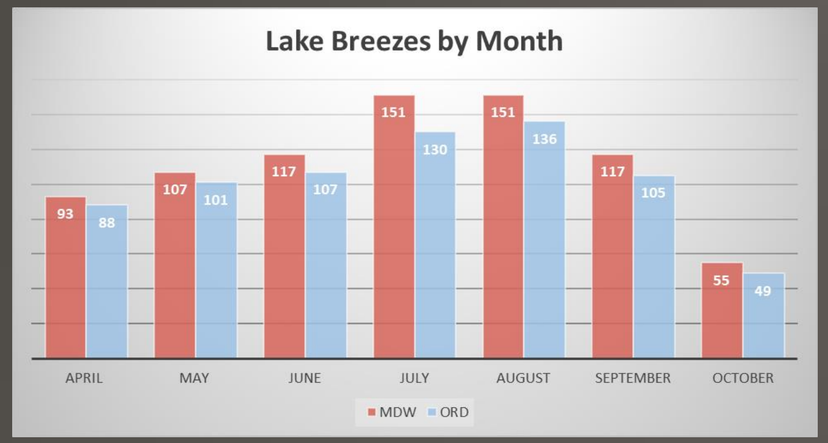
Methods

- 20-year period
- 10° to 160°
- 3-hour averages
- 8 parameters recorded
- MDW: 791 ORD: 716

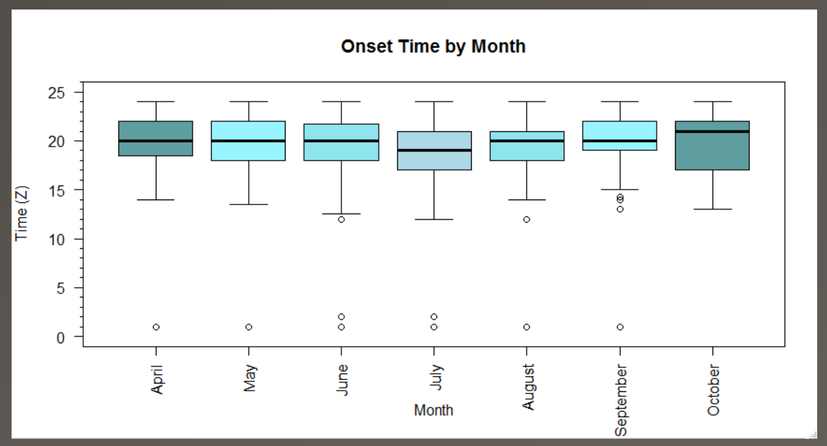
1. Time
2. Wind Direction
3. Wind Speed
4. Maximum Temperature
5. Morning Cloud Cover
6. Morning Cloud Height
7. Afternoon Cloud Cover
8. Afternoon Cloud Height

Results

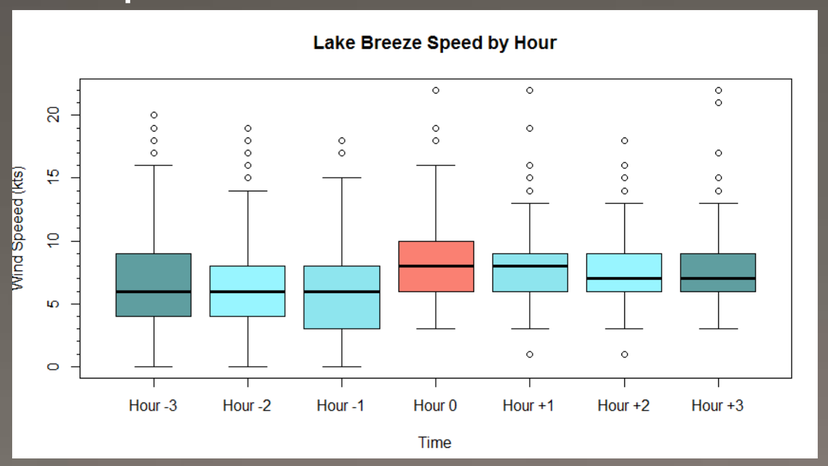
- **Frequency**



- **Time**



- **Speed**



Summary

- Lake Breezes are most common during July and August
- ORD receives a median value of 35 lake breezes per year
- Generally, lake breezes arrive at MDW and hour before ORD
- The greatest frequency of onset times are between 18 and 20z
- Lake breezes decrease in speed from spring to fall
- Onset time does not exhibit seasonality
- Median speed of a lake breeze is 8 knots
- 48% of lake breezes reach 10 knots during their duration

Future Work

- Center Lake Buoy 45007
  - Pressure
  - Air temperature
  - Water Temperature
- Regression Analysis

References

- Hall, C.D., 1954: Forecasting the Lake Breeze and Its Effects on Visibility at Chicago Midway Airport. *Bull. Amer. Meteor. Soc.*, **35**, 105-111
- Laird, N.F., Kristovich, D.A.R, Liang, X., Labas, K., 2001: Lake Michigan Lake Breezes: Climatology, Local Forcing, and Synoptic Environment. *J. Appl. Meteor.* , **40**, 409-422.
- Lyons, W.A., 1972: The Climatology and Prediction of the Chicago Lake Breeze. *J. Appl. Meteor.*, **11**, 1259-1270.