The Ontario Winter Lake-effect Systems (OWLeS) Project
Influences of Upwind Lakes

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Recent Lake-Effect Field Projects

Univ. Chicago Lake Snow Project
  Braham and Kelly (1982)
  1970s and 1980s

Lake Ontario Winter Storms
  Reinking et al. (1994)
  1990

NWS Lake Effect Snow Study
  e.g., Gurka (NWA, 1997)
  Mid-1990s

Lake-Induced Convection Experiment
  Kristovich et al. (2000)
  1997-1998

Great Lakes Ice Cover – Atmospheric Flux Experiment
  Gerbush, Kristovich, Laird (2005)
  2004

Long-Lake Axis Parallel
  Steiger et al.
  2010-2011
OWLeS – Ontario Winter Lake-effect Systems Field Efforts
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Photo by S. Kristovich

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Lake-to-Lake Lake-effect Cloud Bands

TWO FOCUS POINTS

• What are the effects of upwind lakes?

• Process by which the influence occurs

Rodriguez, Kristovich, and Hjelmfelt (2007)
OWLeS January 28, 2014
Lake-to-Lake Lake-effect Cloud Bands

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Rodriguez, Kristovich, and Hjelmfelt (2007)
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King Air N2UW Flight Track

Open Water
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WCR Radar Reflectivity (dBZ)
(WCR vertical velocity)$^2$ (m$^2$/s$^2$)
Lake-to-Lake Lake-effect Cloud Bands

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Rodriguez, Kristovich, and Hjelmfelt (2007)
Summary and Findings

- Plume of air modified by Lake Erie
- Observed Influences of Plume
  - Clouds formed more quickly
  - Increased snowfall rate
  - Increased vertical mixing
- Subsidence near shoreline
- Influences
  - Reduced upwind stability
  - Cloud-scale circulations
  - Potential Seeding
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- University of Illinois Sounding Team
Look for our article in BAMS!

Courtesy of Bart Geerts
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Spatial Evolution of Lake-effect Snow

Flight Leg 13, Flight Stack B, 818 m AGL average
The red line indicates the shore line.
Locations of vertically-consistent updrafts