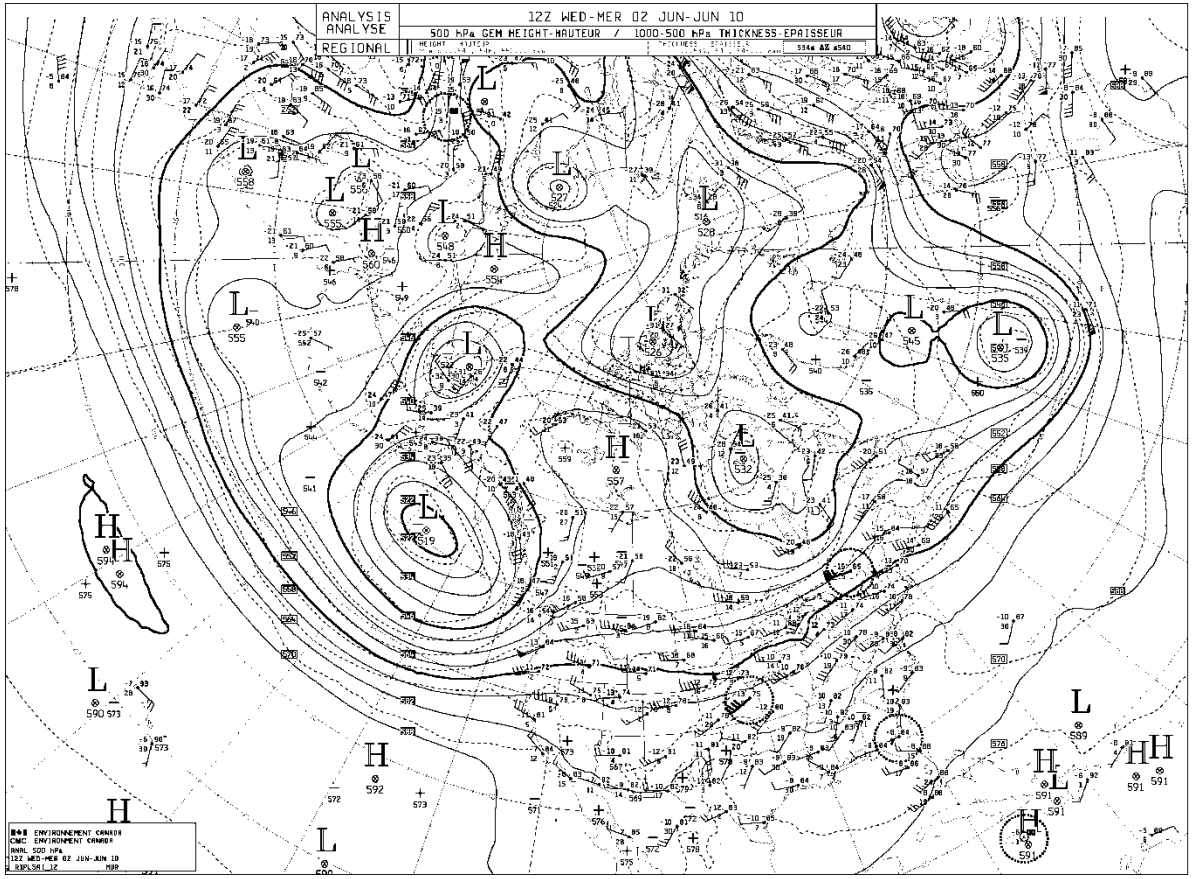
# Satellites, Weather and Climate

## *Background & philosophy*




SWAC

The UNIVERSITY of VERMONT

NSF

VERMONT

# Satellites, Weather and Climate (SWAC)

# Introduction

**Lesley-Ann Dupigny-Giroux, Ph.D. & the SWAC team**

**University of Vermont**

# Acknowledgements


- NSF Geoscience Education (GEO-0807787 & 1034945)

- Vermont Department of Education – Math & Science Partnership

# The SWAC Team

- Dr. Lesley-Ann Dupigny-Giroux (Geography, UVM)
- Dr. Regina Toolin (CESS, UVM)
- Drs. Leslie Morrissey & Jen Pontius (RSENR)
- Drs. Bruce Berryman & Jay Shafer (LSC)
- Steve Hogan
- Mike Fortney
- Mark Breen & Steve Maleski (Fairbanks Museum)

# SWAC is...

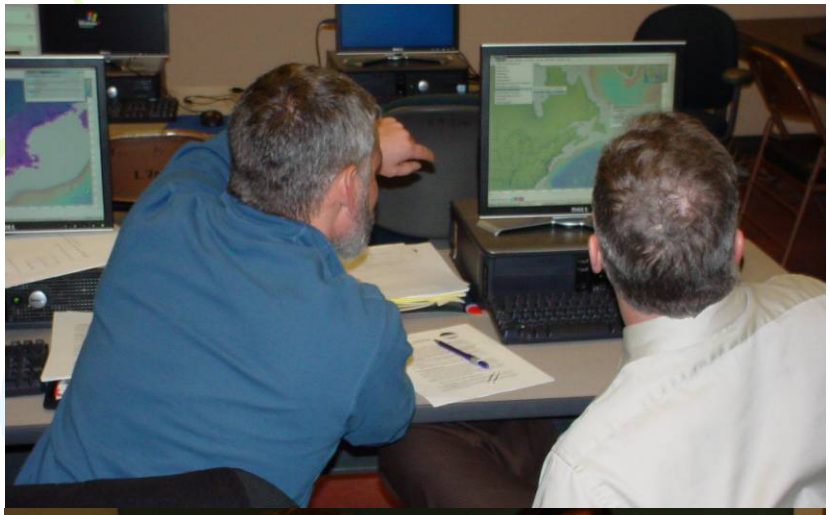
- professional development
- in-service science & math teachers
- middle and high schools
- inquiry & project based learning
- STEM content knowledge & skills
  - climate, weather
  - engineering
  - geospatial  technologies

# The need for SWAC

- varying student and teacher knowledge
- role of the media or Internet
- gender difference in understanding
  - underlying physics vs. patterns

- overarching principles
  - Backward design

# SWAC teachers



- K-12
- Earth Science, physics, chemistry, biology
- social studies

- content knowledge
- curricular constraints

# First eight SWAC modules

- introduction to EMR & satellites
- cloud identification & monitoring
- weather forecasting
- tropospheric profile creation
- land surface interpretation
- permafrost
- Geo-applications
- air quality (real time applications)

# Cloud observations


“I liked going outside and taking our own data like real scientists!” Lizz

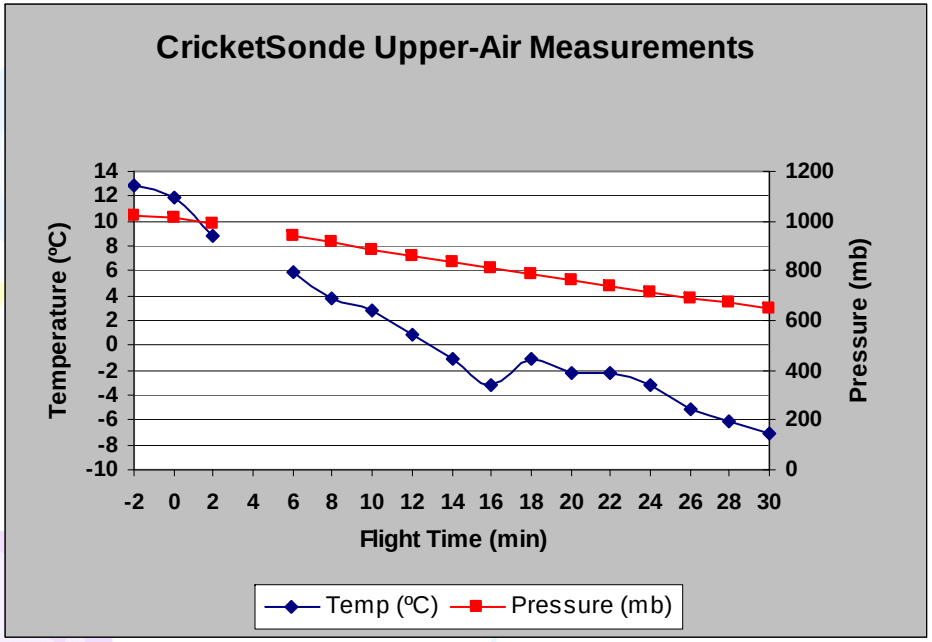
“When we did the weather books it really helped me to understand the symbols and the clouds. It helped by doing it every day to get practice. I can now use those terms and skills to understand the weather on the weather channel.”

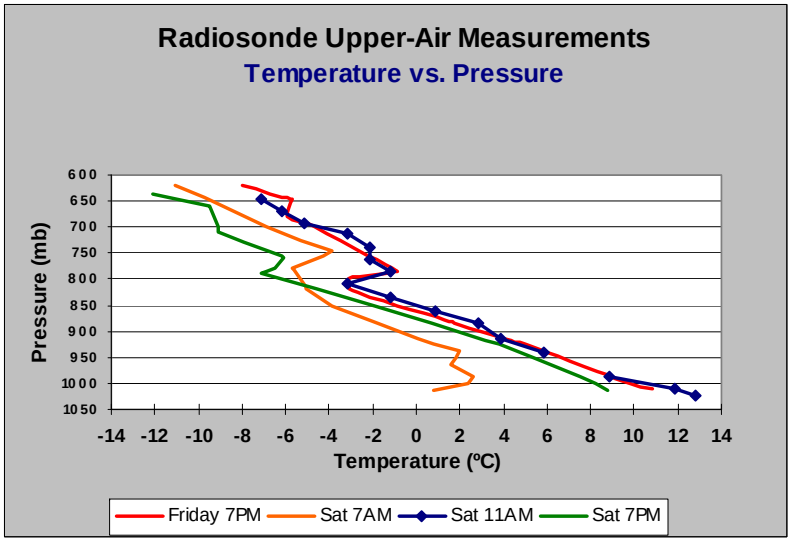
Elise

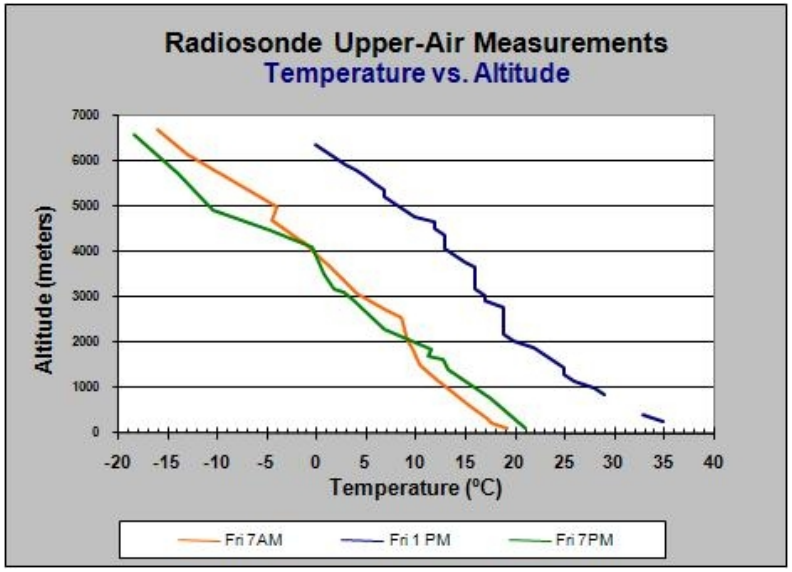
# Balloon launch



# Data from the balloon launches

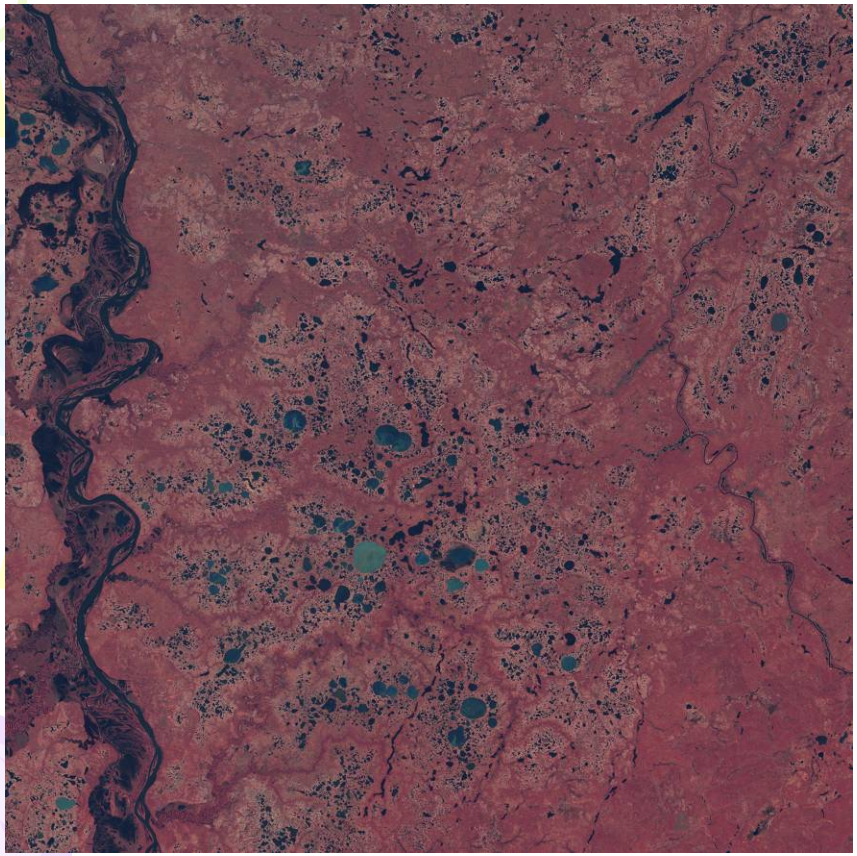



Mike Fortney

# Permafrost in Siberia



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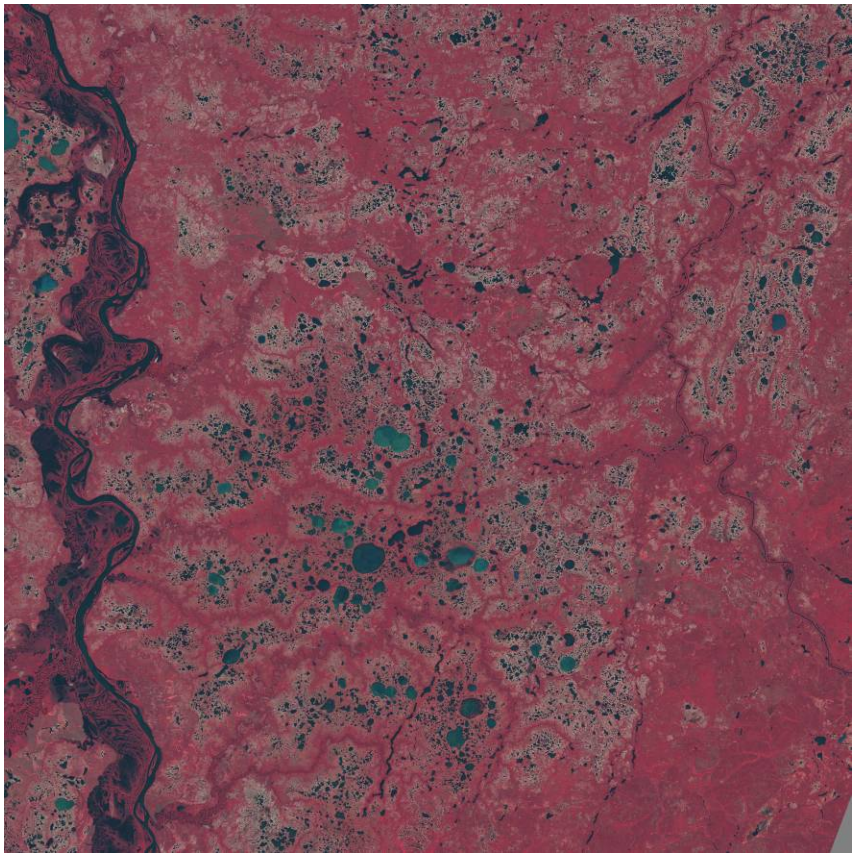

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# Lessons learned ...

- partnerships are key
- we are all teachers-learners
- not to overload on content
- encourage whole-school approach
- embed core principles in other subject areas
- staged content

- SWAC content reaches diverse students
- Nature of Science
- implementing Project-based learning and backward design
- “more enthusiastic in class” “thrilled” “new point of view”