

# CANADAC

Canadian Network for the Detection of Atmospheric Change



- In 2002, a group of university researchers joined together under the title of the **Canadian Network for the Detection of Atmospheric Change** (CANDAC) with the objective of improving the state of observational atmosphere research in Canada.
- This group recognized the need for an Arctic laboratory and identified the **Polar Environment Atmospheric Research Laboratory** (PEARL) in Eureka, Nunavut as the ideal station.
- They worked enthusiastically to raise funds to run the facility and had a fully-functional Arctic lab operating in 2005.
- Since then, researchers have been taking various measurements to monitor and better understand current atmospheric conditions.

# Funding for CANDAC has been provided by:



Canadian Foundation for Climate  
and Atmospheric Sciences (CFCAS)  
Fondation canadienne pour les sciences  
du climat et de l'atmosphère (FCSCA)



Ontario  
Innovation  
Trust



Canada Foundation for Innovation  
Fondation canadienne pour l'innovation



Environment  
Canada

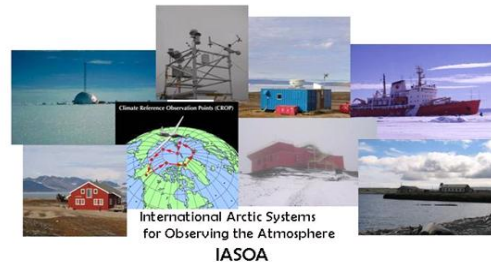
Environnement  
Canada



**NSERC**  
**CRSNG**



Ontario MINISTRY OF  
RESEARCH & INNOVATION



International Arctic Systems  
for Observing the Atmosphere  
IASOA

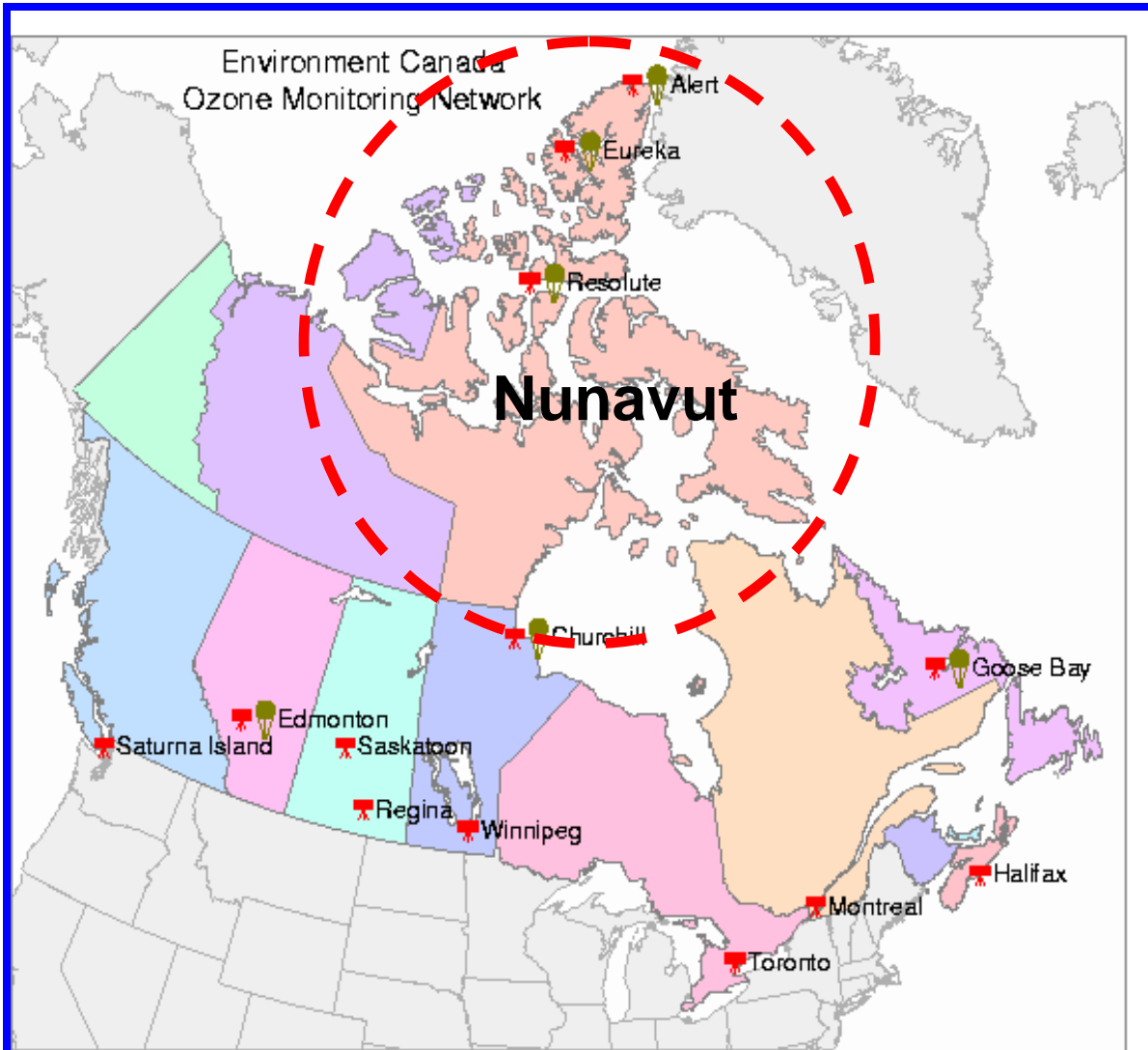


**Nova Scotia Research  
and Innovation Trust**

Polar Continental Shelf Project (PCSP)



# Where do we take measurements?



- CANDAC researchers collect data in Nunavut.
- Nunavut is a Canadian territory located in the Arctic.

- Many animals including caribou, polar bears, Arctic wolves, Arctic hares, whales and seals live in Nunavut.



Polar bear photos courtesy of Andrea Moss



Arctic hare Photo courtesy of Pierre Fogal.

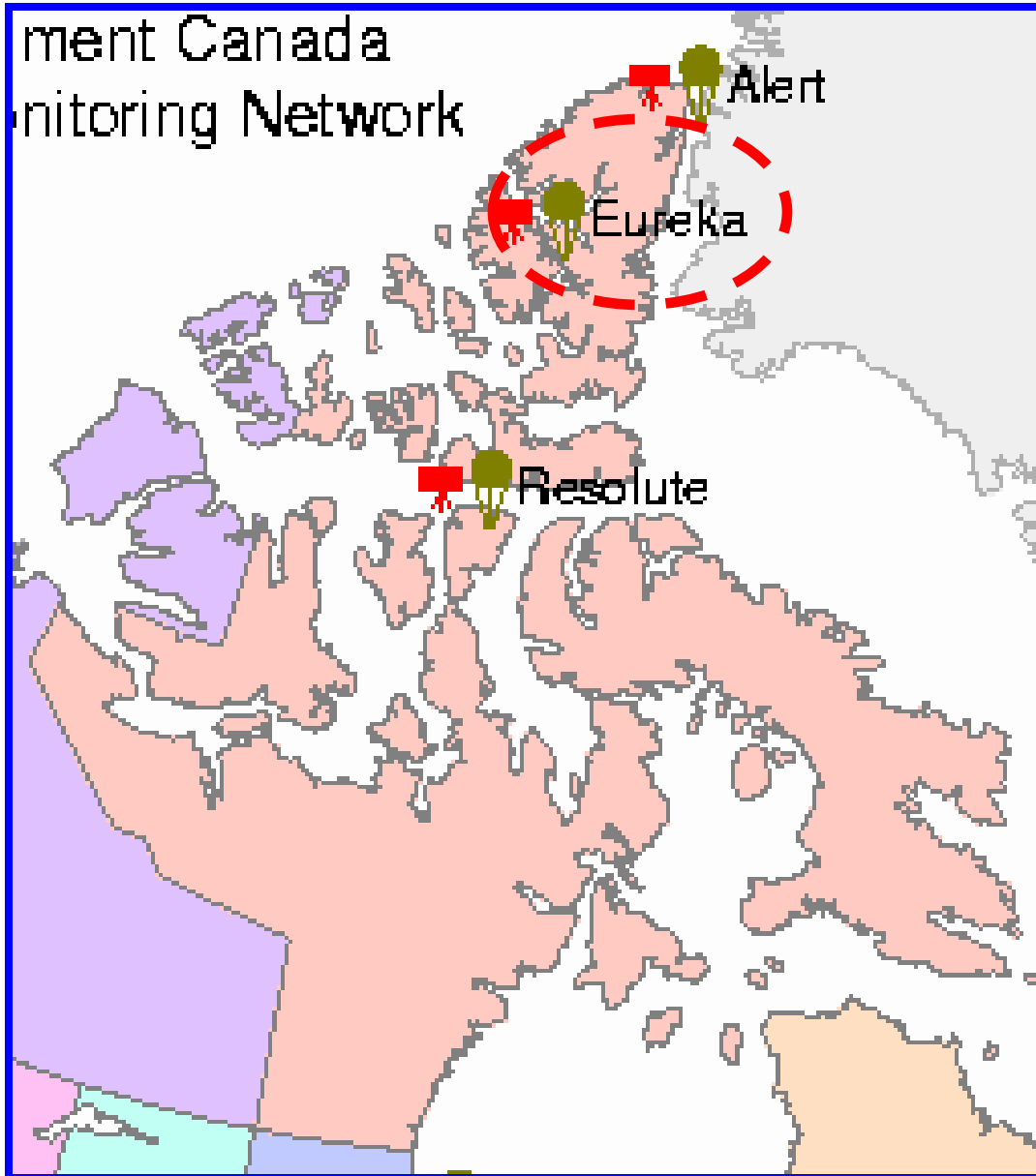


Wolf photos courtesy of Emily McCullough



Caribou Photo courtesy of Pierre Fogal





- Eureka is located on Ellesmere Island in the High Arctic.
- It is not too far from the North Pole.



Photo courtesy of Pierre Fogal

- Many CANDAC researchers operate their instruments from the Polar Environment Atmospheric Research Laboratory (PEARL) located in Eureka.
- Researchers typically travel to PEARL by airplane.



Photo courtesy of Pierre Fogal

# CANDAC International Polar Year Legacy Project: Educational Resources

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- As part of the International Polar Year (IPY) Legacy Project, CANDAC has created educational resources aimed at enhancing environmental science education in classes from kindergarten to grade 12.
- Educational materials can be found at:  
<http://candac.ca/candac/Outreach/Outreach.php> .
- This particular presentation is about:

**Weather!**



# What is Weather?

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Weather is....

- what is happening outside.
- temperature, cloudiness, snow/rain and wind.
- always changing.

# What kind of weather?



Photo courtesy of Niall Ryan

# What kind of weather?



<http://www.freeimages.co.uk/>

# What kind of weather?



Photo courtesy of Rodica Lindenmaier



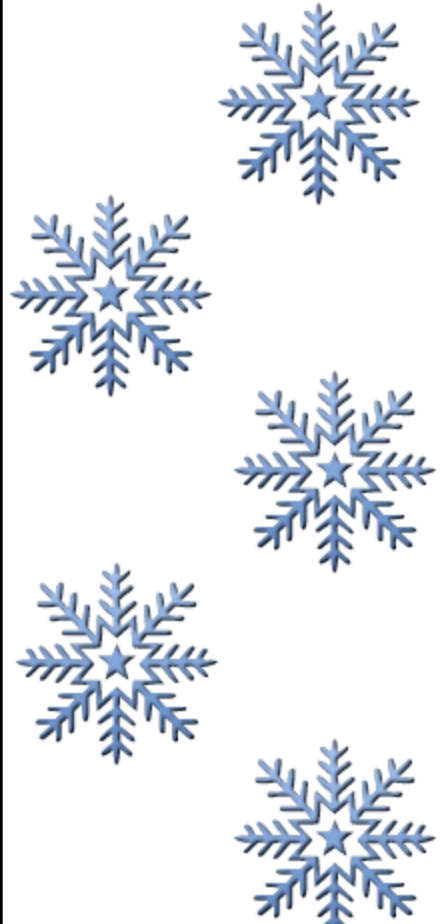
# Seasons

# WINTER

## What kind of weather?



Photo courtesy of Jonathan Franklin



# SPRING

## What kind of weather?



# SUMMER

## What kind of weather?



Photo courtesy of Tara Cunningham

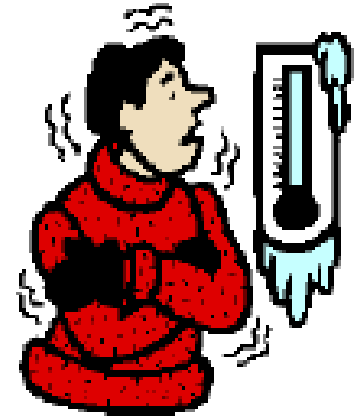


Which season is missing?



The study of weather  
is call meteorology.

How do we measure  
the weather?



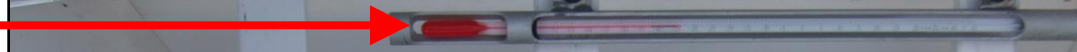
# Stevenson Screens

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Photo courtesy of Tobias Kerzenmacher

Thermometer



Thermo-barograph

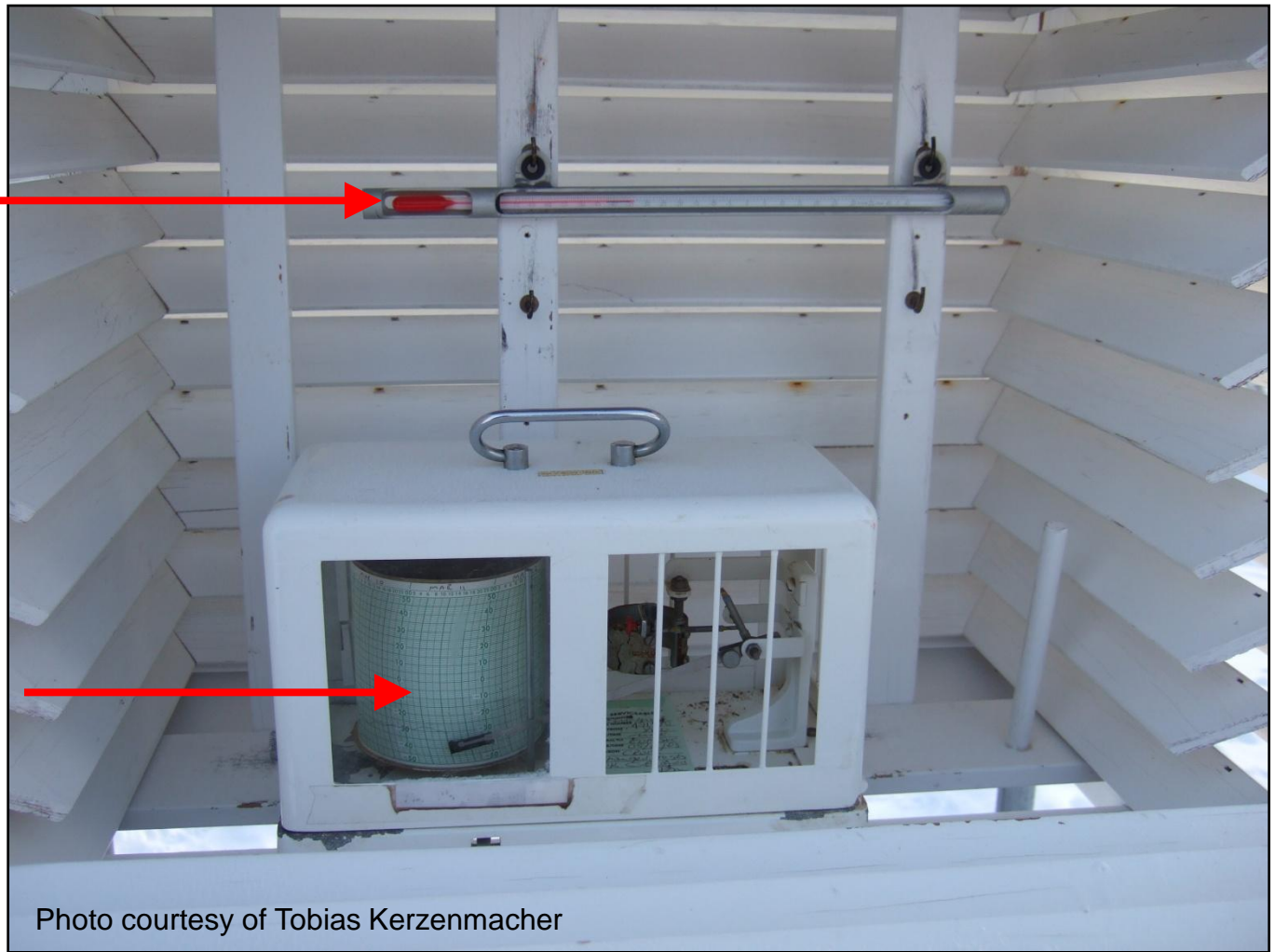
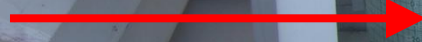


Photo courtesy of Tobias Kerzenmacher

- This photo shows the inside a Stevenson Screen.



# Snow Gauge



Photo courtesy of Tobias Kerzenmacher





# Rain Gauge



Model CS700 (c) 2002 Campbell Scientific (Canada) Corp.

<http://www.campbellsci.ca/Catalogue/prfull/cs700.jpg>



# Wind Measurements

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Anemometer  
(measures wind speed)

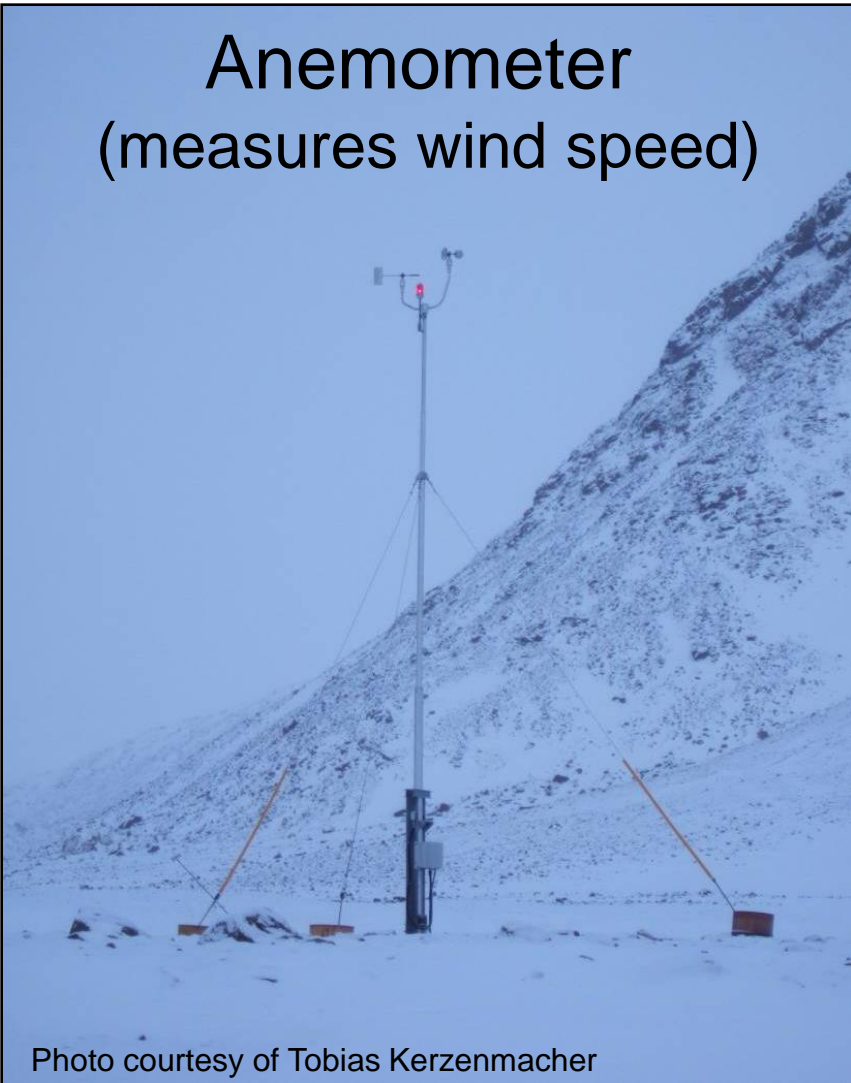


Photo courtesy of Tobias Kerzenmacher

Wind Sock  
(measures wind direction)



Photo courtesy of Tobias Kerzenmacher



# Ice Thickness Measurements



Chris Polashenski of Dartmouth College (left) and Benny Hopson from the Barrow (Alaska) Arctic Science Consortium bore a hole through sea ice in the Chukchi Sea on July 4.

Caption courtesy of

[http://www.nasa.gov/topics/earth/features/icescape2010\\_arctic\\_ice.html](http://www.nasa.gov/topics/earth/features/icescape2010_arctic_ice.html)

Photo courtesy of NASA/Kathryn Hansen

- Ice thickness can be determined using drill-hole measurements.
- A hole is drilled in the ice using an ice auger.
- Ice thickness is measured using a measuring tape equipped with a hinged weight at the end.
- The tape and weight are lowered through the hole and then pulled upward until the weight catches on the bottom of the ice.
- The tape is then read to determine the thickness of the ice.

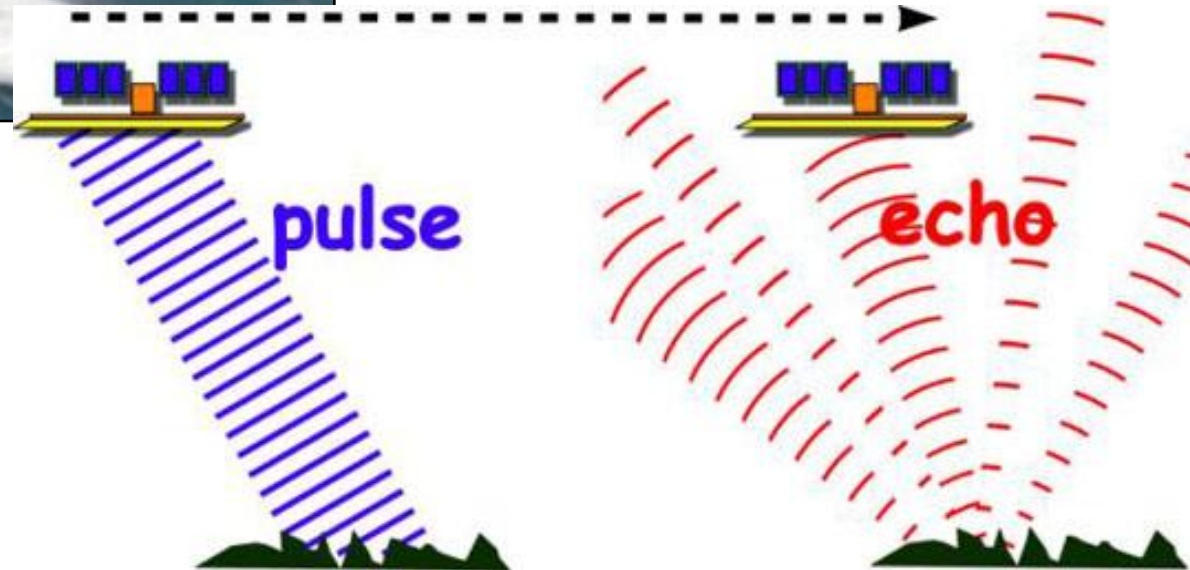


# RADARSAT-2



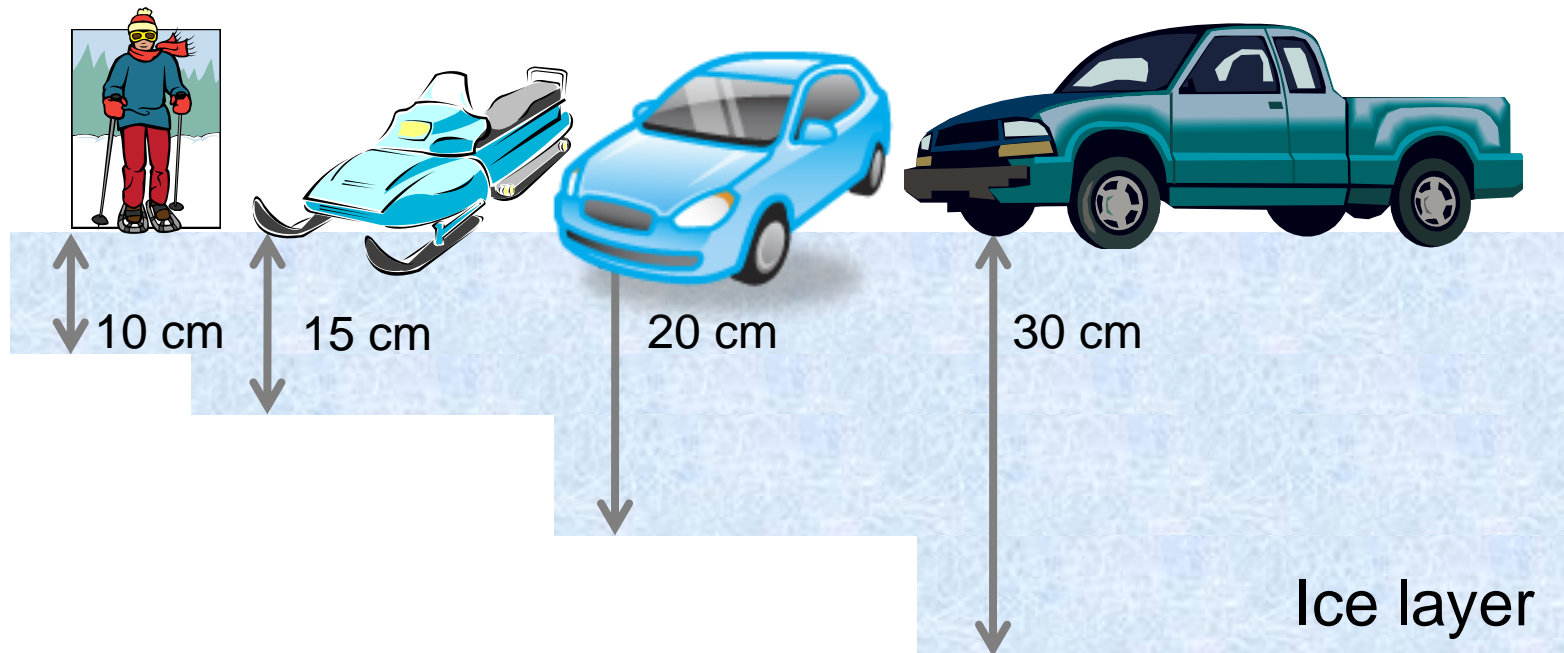
- Ice thickness can also be measured using satellites equipped with radar.

<http://www.asc-csa.gc.ca/images/recherche/photo.aspx?id=448&format=0&search=radarsat-1&l=eng>



<http://polar09.yesican-science.ca/Blogs/?view=136>

- Thicker ice can usually support more weight than thinner ice, but the quality of the ice and the way it formed is also important.
- In order to be safe, people planning to travel or play on ice should know the thickness and approximate weight it is able to support.



# Weather Balloons

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Photos courtesy of: Tara Cunningham



# Weather Satellites

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Envisat Satellite



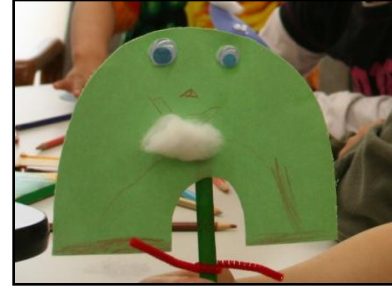
Moderate-resolution Imaging Spectroradiometer

Earth



# Weather Puppets

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1. Using half a sheet of construction paper, draw and cut out a weather shape (sun, raindrop, cloud, rainbow, snowflake).
2. Add accessories/decorate using additional construction paper, markers.
3. Add arms/legs with pipe cleaners and googly eyes.
4. Attach weather shape to popsicle stick (handle) with scotch tape.



# Weather Mobiles

1. Glue two popsicle sticks in an “x” shape to form mobile base.
2. Using scrap paper, draw small pictures of seasonal weather (snow for winter, rain for summer). The teacher may also choose to provide printed images for students who find drawing very challenging.
3. Using string, attach pictures to the mobile and decorate.

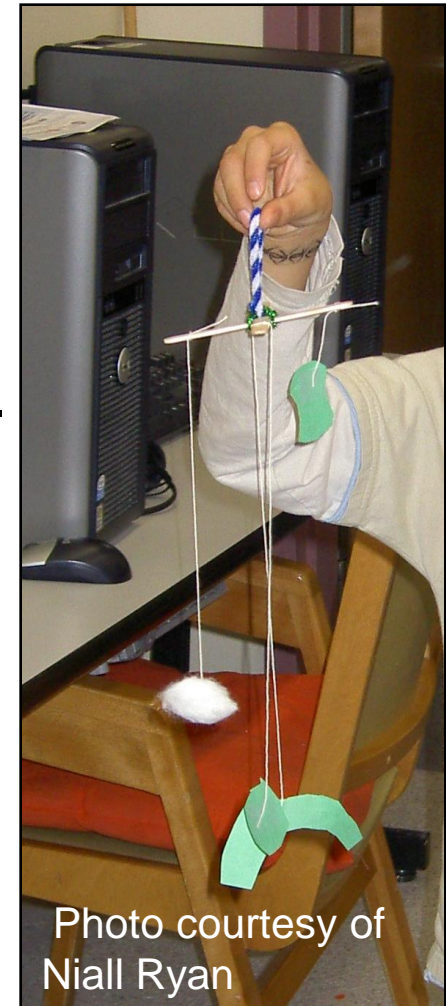


Photo courtesy of Niall Ryan