



A MAP THAT'S OUT OF THIS WORLD!



SCIENCE AND TECHNOLOGY

MISSION DESCRIPTION

Students will use the Canada from Space Giant Floor Map to learn about the importance of Earth observation satellites in providing radar data to support scientific research and a deeper understanding of Canada, its lands, its oceans and its people. The Giant Floor Map can be reserved for free from Canadian Geographic Education for a period of three weeks during the school year (and will come as part of a kit containing the map, a teacher's guide, coloured pylons and chains, and activity cards). Alternatively, a smaller tiled version of the map and the teacher's guide can be downloaded and printed. Teachers can choose between 17 different activities in the teacher's guide, which range from a general introduction to mapping, to the detection of natural disasters, to the tourism industry in Canada's North. The activities are designed such that students will be guided through a series of hands-on learning exercises rooted in observation, critical thinking and problem solving. Students will gain extensive knowledge in the practice of Earth observation and the use of radar data to interpret changes on Earth's surface.

Difficulty: **MODERATE**

Duration: **90 MINUTES**

Materials: **MODERATE**

GOAL

Students will develop their spatial awareness and critical thinking skills, as well as their understanding of Earth observation from space, by performing a series of activities on the Giant Floor Map (or in conjunction with the Tiled Map).

TIMELINE

Description	Duration ¹
Introduction to the activity of choice	15 minutes
Development of basic knowledge	35 minutes
Discussion of central themes and conclusion	25 minutes
Extension of geographical thinking	15 minutes
Total	90 minutes

¹ Duration is per activity, of which there are 17 options to be run with the Giant Floor Map or the Tiled Map.

OBJECTIVES

By the end of this mission, students will be able to:

- Explain how raw data can be used to create a map
- Interpret patterns and trends presented on a map or in a photograph
- Develop hypotheses regarding the causes of environmental change in different parts of Canada and make informed decisions about how those changes should be monitored in the future
- Think critically about the functioning of a satellite in space and the changes happening at Earth's surface



BACKGROUND

In 1968 the crew of Apollo 8 became the first people to travel around the dark side of the Moon. Astronaut William Anders took the famous picture *Earthrise* during that mission. Nature photographer Galen Rowell called *Earthrise* “the most influential environmental photograph ever taken.” Viewing the planet from that far away had a huge impact on the environmental awareness of people back on Earth. In fact, the inaugural Earth Day was held the very next year.

Canadian Space Agency astronaut David Saint-Jacques credits photos of our home planet taken from the Moon with sparking his interest in becoming an astronaut when he was a child. He was moved by the new perspective he gained from those photos. Since that time, Canada has contributed to Earth observation with satellites that monitor many environmental issues including ice floes, farmland and natural disasters.



Earthrise. Credit: NASA

The Canada from Space Giant Floor Map was born out of a partnership between Canadian Geographic Education, the Canadian Space Agency, and Ingenium (formerly known as the Canada Science and Technology Museums Corporation). As the first of its kind, this map is composed of images taken by the Canadian satellite RADARSAT-2, which orbits Earth to collect data related to sea ice extent, the movement of icebergs, agricultural outputs, pollution management, ecosystem health, and much more.

To create this map, hundreds of RADARSAT-2 images, taken in May 2013, were superimposed and stitched together. It is unlike other maps of Canada in that it incorporates vivid colours to distinguish between parts of the country that have different human and natural characteristics. However, since many different data sets were used to create this map, the colours do not follow an organized pattern, meaning the yellow in the North may not mean the same things as the yellow somewhere else.

Here lies the challenge (and the fun!) of using this map to explore the geography and topography of Canada. You and your students can take a stab at analyzing this map, deciphering the different colours, identifying patterns and trends, and developing your own version of a legend. Consider yourselves part of the ongoing and ground-breaking research and analysis that expert scientists do day in and day out.

MISSION PREPARATION

MATERIALS

Please refer to the list of materials associated with each individual activity in the teacher's guide. For the Giant Floor Map activities, all materials will be provided.

SET-UP

Preparation instructions for each activity are described in the teacher's guide.

MISSION INSTRUCTIONS

Visit Canadian Geographic Education's Canada from Space Giant Floor Map website and refer to the teacher's guide for detailed instructions specific to each of the 17 activities. We suggest beginning with activity one (a general introduction to mapping), two (an activity using Chris Hadfield's photographs), and nine (coastal observation). To order a Giant Floor Map kit, teachers must [sign up](#) to be a member of Canadian Geographic Education. The [Tiled Map](#) and [activities](#) are available to download for free.

<http://www.cangeoeducation.ca/members/join/default.asp>

http://www.canadiangeographic.com/educational_products/tiled_map_canada_from_space.asp

http://www.canadiangeographic.com/educational_products/canada_from_space_map.asp

MISSION PARTICIPATION

Order Canadian Geographic Education's Canada from Space [Giant Floor Map](#) or print your own copy of the Canada from Space [Tiled Map](#).