THE RISE AND FALL OF THE GREAT LAKES

Directed by Bill Mason
Canada | 1968 | 17 min

TEACHER’S GUIDE

This guide has been designed to help teachers and students enrich their experience of documentary film by providing support in the form of questions and activities. There are a range of questions that will help teachers frame discussions with their classes, activities for before, during and after viewing the film, and some web links that provide starting points for further research or discussion. In separate packages, there will also be support materials available with information regarding general viewing and teaching principles for documentary film and the fundamental aspects of making documentary films.

The Film

This is a humorous yet poignant look at the geological and ecological evolution of the Great Lakes. Blake James is a lone canoeist who paddles through time and unwittingly and unwillingly experiences all the natural and man-made changes which have taken place since the lakes were formed. This film contains hilarious scenes of Blake falling out of the sky in a canoe, running out of water mid-rapid and mistakenly slurping a cup of foaming polluted water. A must-see for kids and adults alike.

The film offers a lesson in geography, which concludes that, although the Great Lakes have had their ups and downs, nothing has been harder to take than what humans have done to them lately. In the film, a lone canoeist lives through the changes of geological history, through Ice Age and flood, only to find himself, in the end, trapped in a sea of scum.

The Filmmaker

Bill Mason grew up in Winnipeg, Manitoba. He graduated from the University of Manitoba’s School of Art in 1951 and went on to a creative career as a commercial artist, animator, filmmaker, author and painter. His film won 10 international awards, including Best Specialized Film, presented by England’s Society of Film and Television Arts, in 1971.

Educational package written and compiled by Dimitra Tsanos dimitra.tsanos@tel.tdsb.on.ca

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Facts on Glaciation in North America

Glaciation is defined as the formation, movement and recession of glaciers. At present, glaciers cover about 10 per cent of the world’s land area (14.9-million square kilometres). Most of this area is under the Antarctic and Greenland ice sheets; only about 700,000 square kilometres are covered by the thousands of glaciers in the remainder of the world. Glaciation has been much more extensive in the past than it is today, occurring mostly as large continental ice sheets. During expansion and recession of glaciers, the processes of erosion and deposition may occur.

Depositional Features

As erosion takes place in one area, deposition may occur in another. Forms such as drumlins (streamlined, oval mounds commonly between 15 and 25 metres high and about 1,500 metres long) and certain kinds of ground moraine (low-relief, undulating terrain commonly up to six metres high) can form under moving ice. However, most glacier deposition takes place near the terminus (boundary) during retreat of the ice. Features which can occur include hummocky moraine, high-relief forms up to about 10 metres high, consisting of mounds, ridges and knobs, some doughnut-shaped; series of arcuate (bow-shaped) ridges of varying heights and lengths, named (according to their form, origin and position) cross-valley, ribbed, washboard, De Geer, push, ice-thrust and recessional moraines; single, prominent ridges marking the limit of a glacial advance, called end or terminal moraines; and ground moraine. Most of these features contain a high percentage of glacial till.

Till, in the strictest sense, is unstratified, unsorted material deposited directly from a glacier. It usually consists of a heterogeneous mixture of clay, silt, sand, pebbles, cobbles and boulders, with most constituents closely reflecting the composition of local bedrock. Commonly, larger particles are angular to well-rounded, striated, and show a preferred orientation. Till can be subdivided into several types depending on the location of debris in the ice and how it was deposited.

Glaciers are also directly or indirectly responsible for various other deposits. Meltwater, originating on the surface, inside a glacier, or at its base, may form braided streams beyond the glacier margin. These streams display an interconnecting network of shallow channels which carry and deposit gravel and sand. Gravel is an important industrial resource in Canada, and some of the largest deposits have resulted from glacier-derived braided streams. An outstanding modern example is the Donjek River in Yukon, fed from the Donjek Glacier in the St. Elias Range. Kames and eskers (knoblike features and sinuous ridges, respectively) result from the deposition of sand and gravel by ice-content glacial streams.

Glacially associated lake deposits form large plains that cover wide areas of Canada. The lakes were formed by direct damming by the glacier or by impedances to pre-existing drainage. Manitoba’s former glacial Lake Agassiz is an outstanding example of a glacially dammed lake. Most sediments deposited in glacial lakes consist of silt and clay, which commonly form varves, ie., pairs of coarse and fine layers deposited in one year. Beach ridges composed of gravel and sand occur along the margins of some former glacial lakes.

The absence of vegetation in recently deglaciated areas and the exposure of unconsolidated sand and silt (such as occurs in interchannel areas of braided rivers and former lake beds) allow wind to form sand dunes and deposit loess. Dunes are formed by the shifting of sand by saltation and traction; loess deposits, consisting of fine sand and silt, originate from suspended material that may have been carried hundreds of kilometres.
Major Advances and Retreats

The areal extent and succession of glacial deposits indicate how far and how often glaciers expanded in the past. Most is known about glacial activity of the past two- to three-million years, although evidence indicates that glaciation took place several times during geological history. During the Pleistocene Ice Age, as much as 30 per cent of earth's surface was covered by glaciers. Glaciers formed and expanded in mountainous regions throughout the world. In northern latitudes (e.g., Canada and northern Europe), ice caps developed, expanding to ice sheets. About 97 per cent of Canada was covered; hence, this country contains more glaciated terrain than any other.

The number of major glaciations that occurred during the ice age is open to question. Traditionally, four glaciations were recognized, each lasting approximately 100,000 years, separated by long, warmer periods. From oldest to youngest, these are known in North America as Nebraskan, Kansan, Illinoian and Wisconsinan. Within these major glaciations, minor glacier retreats and advances are recognized. New evidence and reinterpretation of old data suggest that ice did expand and retreat many times, but the complexity of the data is such that it is not even possible to say with certainty that there actually were four major glaciations. Much is known about the Wisconsinan, less about previous glaciations.

As recession of the ice sheets took place, most of the glacial landforms seen today across Canada were formed. There were minor re-advances during the overall retreat, but in general the retreat was relatively rapid, with ice withdrawn from large parts of Canada by 10,000 years ago. Since that time, glacial and other landforms have been modified by various agents such as water and wind. However, these changes have been minor, and the preservation of the present glacial landscape is ensured for thousands of years to come.

Source: [http://www.thecanadianencyclopedia.com/index.cfm?PgNm=TCE&Params=AIARTA0003271](http://www.thecanadianencyclopedia.com/index.cfm?PgNm=TCE&Params=AIARTA0003271)
VIEWING THE FILM WITH STUDENTS

There are important themes in this film that have broad implications for students and their futures. Take time to activate your students’ background understanding of these themes before viewing. This will help them as they come to their own understanding and develop their critical abilities.

The following three subsections, on this page, are intended to provide you with a range of pre-viewing, viewing and post-viewing activities. They are followed by a set of questions based upon the film’s larger thematic domains, some follow-up questions and quotations, sample curricular outcomes, and a page of web links for further investigation.

Pre-Viewing Activities

In partners, have students complete the activity Analyzing Satellite Imagery of the Great Lakes Region found on page four.

With a partner, have students look at the satellite photo of the Great Lakes region. They should label the image using the instructions in the worksheet and then answer the three questions on a separate sheet. As an alternative, if a smartboard is available, have students in groups come up and label the lakes, bays, straits and rivers, using different colours.

To explain how glaciation helped form the Great Lakes, use the four images on pages five and six and project the four sequences from the film onto a screen. Explain each stage, and discuss when it happened, the elevation and drainage, as well as how the weight of the glacier influenced the land.

Print several of the questions or quotations from page seven on individual sheets of paper. Have students work in small groups or with partners to discuss if they agree with the ideas. Have them share the statement and what they think or believe about it with the class.

Set a purpose for viewing by having a discussion about one or more of the questions or quotations from page seven.

Viewing Activities

Have students use a graphic organizer to summarize the film as they watch it. There are three areas of interest that are in the film: before, during and after glaciation.

Stop the film at various points and have students provide summaries at each point.

Have students jot down five ideas for discussion, or questions that the film raised in their minds.

Post-Viewing Activities

Show the students their quotations from the pre-viewing activity and see if their minds were changed or opinions altered or enhanced by the film.

Have student complete an exit note (single small sheet of paper with one phrase or idea written on it) that demonstrates one thing they have learned, felt or decided as a result of watching the film.

Discuss with students their initial reactions to the various characters and situations confronted in the film.

Have students work in groups of three and create a slideshow called Great Lakes Environmental Plan, where they will be assigned an industry that relies on the lakes. Research will address each industry’s need to change their current practices to benefit the environment. The rubric and assignment are on page eight and nine.

For further ideas around how to explore this documentary, use the guiding questions on page seven.
PRE-VIEWING ACTIVITY: ANALYZING SATELLITE IMAGERY OF THE GREAT LAKES REGION

With a partner, use the satellite image of the Great Lakes region to answer the following questions on a separate paper. Hand in when complete.

• Identify and label each of the Great Lakes, bays, straits and oceans.
• Using a thin blue marker, outline and label all the major rivers.
• How does this region use the Great Lakes? Discuss three different uses.
• Research three occupations that would use satellite images. Explain how it is useful to their job.
• Think of three areas of possible land-use conflict. Discuss how humans have interfered with the Great Lakes.
STAGES OF GLACIATION IN THE GREAT LAKES

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THE BIG QUESTIONS/IDEAS/THMES

Multiple Perspectives
What is the subject of this film? Can you determine the filmmakers’ perspective on this subject? What evidence can you find in the film to support your view?

How does this film help you analyze and interpret points of view about issues that concern people?

Does the filmmakers’ perspective foster respect for diversity and an inclusive society? If so, how?

Identity
Whose story is told in this documentary? Whose story is not told? How does this story, and the way it is told, help you understand your own community/life?

How do the people in this film identify with their community? What are the common bonds among the people in this film? What challenges do they face in expressing their identity?

What film techniques do the filmmakers use to convey the identity of the people in this film?

Citizenship
What insights does this documentary offer about the ideals of good citizenship in the community depicted in this film?

How does the film deal with issues of freedom, equality, human dignity, and individual and collective rights and responsibilities?

Change and Continuity
How does this film help you understand a community’s values and its attitudes towards an issue at a particular time?

What changes do the people in the film experience? What causes those changes? What are the consequences of those changes for the people in the documentary?

Culture and Community
Which aspects of a people’s culture does this film focus on? Why do you think the filmmakers focused on those aspects?

How do the images, themes and message of this film help you understand the filmmakers’ attitude towards the subject? What do you think might have been the intended audience’s attitude towards the documentary subject?

Individuals, Societies and Economic Decisions
What economic systems are at work in this film? What are some of the causes and effects of the economic decisions made by the people in the film’s community?

Does money play a part in the decisions being made in the film and what does it tell you about their local culture?

Power and Governance
What system of government control do we see in this documentary? How is power distributed within this society? What are the implications of that distribution on issues affecting the people’s well-being and freedom?

Global Connections
What global issues are addressed in this film? What is the filmmakers’ point of view on the opportunities and challenges of those issues?

Adapted from NFB Documentary Lens: http://www.nfb.ca
EXTENSION ACTIVITIES

Additional Questions for Pre- or Post-Viewing Activities

Using a T-Chart, list the following three headers—“Before Glaciation,” “During Glaciation” and “The Present”—to discuss the changes happening to the land. How have the Great Lakes changed?

The Great Lakes used to drain to the north and now they drain to the south? Explain why.

The filmmaker uses a song to narrate the film. Why do you think he chose this form of filmmaking? Does it add to or distract to the film? Discuss.

Throughout the film, the illustration of humans impacting the environment was clearly shown in a negative fashion. List and describe three human activities that negatively affected the Great Lakes region and discuss solutions for each.

Why did the canoeist fall down so far? What time period was he in? What helped you decide?

Knowing now where our drinking water comes from, do you feel that our drinking source is safe? Explain.

Quotations from the Film to Explore:

"The changes keep the world going round."

"Lakes still forming, changing one by one."

"Is this the beginning or the end?"

"When you travel on the water and you think it’s going to be fine, just remember you are bouncing like a tennis ball through time."

"Water shimmers golden, in the ever-golden sun. I hope there’s so much beauty, in the changes that will come."
You have been selected to incorporating an environmental strategy in your industry for the future of the Great Lakes. In groups of three, you will use the information from the government website, the documentary and satellite images to help you create this slideshow. In your groups, you will be assigned an industry. Your teacher will assign you one of the following:

• Mining
• Forestry
• Cargo shipping (by water)
• Fishing
• Pulp and paper
• Hydro electricity
• Tourism

Each group will have very different recommendations/improvements, and will need to address at least four in great detail (each group member will need to make their own). Make sure to include the following in your report:

• How does your industry depend on the Great Lakes presently?
• What are some negative issues that need to be addressed?
• What are the improvements that can be implemented?
• Discuss the implementation process to each of your suggestions (a step-by-step description).
• What organizations, agencies or groups need to be involved?
• Include a timeline. How long do you think each of your suggestions will take to implement?
• What will be the overall image or aim of your plan in the future?

Photos, maps and satellite photos are encouraged to assist in visualizing your plan.

You will be marked as a group; see the rubric for specific expectations.

Due date: __________________________
# GREAT LAKES ENVIRONMENTAL PLAN RUBRIC

Industry: ____________________________
Names: ____________________, ____________________, ____________________

## Knowledge and Understanding

<table>
<thead>
<tr>
<th>Concepts/intro (current practices, negative issues)</th>
<th>Limited success in use of geographic terms and concepts</th>
<th>Some success in use of geographic terms and concepts</th>
<th>Moderate success in use of geographic terms and concepts</th>
<th>Employs geographic terms and concepts with a high degree of success</th>
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<tbody>
<tr>
<td>2.5 2.9</td>
<td>3.0 3.4</td>
<td>3.5 3.9</td>
<td>4.0 5.0</td>
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## Thinking and Inquiring

| Collection of Information (listed at least four improvements, and for each discussed key players, a timeline expectations, and a step-by-step process) | Information indicates limited research skills and does not include sufficient research on own topic | Information indicates moderately effective research skills on the four suggestions | Information indicates effective research skills with most issues examined and considered | Information indicates excellent research skills with all issues thoroughly examined and considered |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5.0 5.2 5.4 5.6 5.8 6.0 6.2 6.4 6.6 6.8 7.0 7.2 7.4 7.6 7.8 8.0 8.2 8.5 9.0 10                                                                                     |                                                                                        |                                                                                      |                                                                                                                                    |

## Application

<table>
<thead>
<tr>
<th>Reports in writing the master plan with clarity (grammar, 3-4 typed pages)</th>
<th>Communicates in writing with limited effectiveness</th>
<th>Communicates in writing with some effectiveness</th>
<th>Communicates in writing with considerable effectiveness</th>
<th>Communicates in writing with a high degree of effectiveness</th>
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<td>3.0 3.4</td>
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<td>4.0 5.0</td>
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</table>

## Communication

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<tr>
<th>Overall image/aim is consistent and clear in all suggestions, and has included many visuals (maps, images and photos) in the slideshow</th>
<th>Overall suggestions are limited/vague; few visuals used; poor quality; map incomplete</th>
<th>Suggestions are somewhat effective; with a few details; some visuals used; acceptable quality; map somewhat complete</th>
<th>Suggestions and overall aim is clear, most issues addressed; many visuals used; good quality; map is effective</th>
<th>Excellent suggestions, overall aim is clear and has many details in plan; visuals are included for each suggestion; map is of excellent quality, illustrating each suggestion</th>
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<tr>
<td>2.5 2.9</td>
<td>3.0 3.4</td>
<td>3.5 3.9</td>
<td>4.0 5.0</td>
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<tr>
<th>Presentation was complete (eye contact, audible and enthusiastic)</th>
<th>Presentation was limited in engaging audience</th>
<th>Presentation engaged audience for some of the time</th>
<th>Presentation engaged audience for most of the time</th>
<th>Presentation engaged audience throughout presentation</th>
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<tr>
<td>2.5 2.9</td>
<td>3.0 3.4</td>
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## Comments:

Total: _______________/30
## EXAMPLES OF CURRICULUM EXPECTATIONS

<table>
<thead>
<tr>
<th>COURSE</th>
<th>OVERALL EXPECTATIONS</th>
</tr>
</thead>
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| Grade 7-8 Geography     | • analyze current environmental issues or events from the perspective of one or more of the themes of geographic inquiry.  
                          • explain how patterns of physical geography affect human activity around the world.  
                          • describe positive and negative ways in which human activity can affect resource sustainability and the health of the environment.                                                                                                                                                               |
| Grade 9 Geography       | • analyze local and regional factors that affect Canada’s natural and human systems.  
                          • evaluate various ways of ensuring resource sustainability in Canada.  
                          • explain how natural and human systems change over time and from place to place.  
                          • explain the relationship of Canada’s renewable and non-renewable resources to the Canadian economy.  
                          • analyze the ways in which natural systems interact with human systems and make predictions about the outcomes of these interactions.                                                                                                                                                        |
| Grade 11 Geography      | • explain the physical processes that create landforms, climate, soils and vegetation.  
                          • evaluate the impact of natural systems on people and their activities.  
                          • evaluate the impact of human life on the environment.  
                          • explain the importance of water to global systems.  
                          • analyze and interpret data gathered through research and investigation, using a variety of methods and geotechnologies.  
                          • explain how humans modify the environment to meet urban needs.  
                          • assess the effects of human activities on urban and regional ecosystems and propose solutions to urban environmental problems.                                                                                                                                              |
WEBSITES AND ONLINE RESOURCES

About the Film
Because the film is slightly older (1968), it does not have an official website. Hot Docs Canadian International Documentary Film Festival has a short description on its site.
http://hotdocslibrary.ca/dsr/#/en/video/22472

About the Filmmaker
The director’s official website contains an overview of his films, DVDs and information about his other work.
http://www.redcanoes.ca/bill/popularfilms.html

About Glaciation
Glaciation of Canada. A PowerPoint slideshow with 11 slides briefly explains the details of the ice ages and a description of the types of glaciers.
teach.rec.retsd.mb.ca/bfrith/notes/Glaciation%20of%20Canada.ppt
Glaciers 101. A useful website that explains the different landforms created from glacial erosion. Useful for a previewing activity.
http://gemini.oscs.montana.edu/~geol445/hyperglac/glaciers101.htm

Essentials of Geology. A website of an online textbook, with chapter 18 on Amazing Ice: Glaciers and Ice Ages. A link below is for a crossword that would be useful for reviewing terminology.
http://www.wwnorton.com/college/geo/egeo/crossword/ch18.htm

The Atlas of Canada. This Natural Resource Canada website provides a variety of maps. Most unconsolidated materials covering the Canadian landmass have glacial origins. A glossary of terms follows with illustrations of various deposits.
http://atlas.nrcan.gc.ca/site/english/index.html

ESRI Canada – Glaciation. This lesson pack focuses on the landforms created by glaciers in the areas of Northern Saskatchewan and Southern Ontario. The glaciation lesson pack is divided into three sections: background information, a teacher’s guide and instructions for the students.
http://www.esricanada.com/english/5684.asp

Various Links for Lesson Plan Ideas, Media Awareness, Critical Literacy and Documentary Films
Using Documentaries in the Classroom: This teacher librarian’s personal website contains excellent resources for teaching with documentary films.
http://www.frankwbaker.com/using_docs_in_the_classroom.htm

Media Awareness: A Canadian non-profit media education and Internet- literacy resource library.
http://www.media-awareness.ca

Center for Media Literacy: A U.S. website which provides several resources for making, understanding and criticizing media.
http://www.medialit.org

The National Film Board of Canada website: On this site is an area with teaching resources and short documentary films that can be used as teaching aides.
http://www.nfb.ca