

CHASING ICE



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CHASING ICE

Directed by Jeff Orlowski

2012 | USA | 75 min

TEACHER'S GUIDE

This guide has been designed to help teachers and students enrich their experience of *Chasing Ice* by providing support in the form of questions and activities. There are a range of questions that will help teachers frame discussions with their class, activities for before, during, and after viewing the film, and some web links that provide starting points for further research or discussion.

The Film

In 2007, Jeff Orlowski got his first taste of the Arctic when as a Stanford student he seized an opportunity to work as a videographer with *National Geographic* photographer James Balog on the initial expedition of The Extreme Ice Survey (EIS). That winter, the EIS team scouted and filmed glaciers that now appear in the documentary feature film *Chasing Ice*. Orlowski, a New York native, has been filming the EIS project around the world, working in some of the most extreme conditions imaginable on locations in Iceland, Greenland, Bolivia, the Alps, Alaska and Glacier National Park, Montana.

Educational package written and compiled by Dimitra Tsanos
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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

Show students the trailer for the film from the official website (www.chasingice.com). Have students work in small groups to try and identify themes or ideas conveyed by the trailer.

Discuss with students how effective/affective the trailer is as a media piece.

Go over some key glaciation terms using the National Snow and Ice Data Centre website (www.nsidc.org) which has a cryosphere glossary. Calving, glacier, climate change and ablation are among the useful terms to go over with your students. Included on the site are factsheets on ice sheets, ice shelves, icebergs and Arctic Sea ice.

Have students read the online *National Geographic* article, "The Big Thaw" (www.ngm.nationalgeographic.com/2007/06/big-thaw/big-thaw-text). The article explores the issues around global warming and melting glaciers. Show the photos from the photo gallery and discuss each one. Then have a class discussion using a mind map on global warming and the global consequences of melting glaciers. Use four categories to organize the class brainstorm—social, environmental, economic and political.

Have students explore NASA's website on global climate change (www.climate.nasa.gov). Links to explore include Arctic Sea ice cover, carbon dioxide levels, sea levels, global temperature and land ice cover.

Show a short video clip (1:20 min) titled *Petermann Ice Island 2012: On the Move* from YouTube (www.youtube.com/watch?v=G08xPmxR28U) and discuss the negative impacts of calving and melting glaciers. Discuss both the environmental and social impacts worldwide.

Using a T-Chart, have students compare the positive and negative effects of climate change.

Print several of the questions or quotations from the Extension Activities section of this guide on individual sheets of paper. Have students work in small groups or with partners to discuss if they agree with the ideas.

Set a purpose for viewing by having a discussion about one or more of the questions or quotations from the Extension Activities section of this guide.

Viewing Activities

Have students take notes on, or jot down connections to, one of the thematic domains from the Big Questions/Ideas/Themes section of this guide. Ask students to find proof from the film that supports their connections.

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.

Assign some of the questions and quotations from the Extension Activities for homework to be taken up the next day in class. Check for completion.

Have student complete an exit note (a 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 scenes and situations addressed in the film.

Have students create a Venn diagram comparing various viewpoints on climate change issues.

Ask students to research Canada's role in climate change. An article from *The Globe and Mail* titled "Canada Formally Abandons Kyoto Protocol on Climate Change" can be printed to discuss the role of Canada and how Canada has pulled out of the Kyoto agreements (www.theglobeandmail.com/news/politics/canada-formally-abandons-kyoto-protocol-on-climate-change/article2268432/). They can also visit Environment Canada's website for more information (www.climatechange.gc.ca). Have a class discussion about Canada's role and how it has changed since Kyoto. Ask students why they think it has changed and what they think the future holds for Canada's role with oil production and clean technology innovations.

Ask students to hypothesize about how the world's climate could change over the next 100 years if humans do nothing to limit the levels of their greenhouse gas emissions. Have them also make predictions about the effects such climate changes could have on humans.

Ask students to write two or three persuasive paragraphs to answer the following questions: In your opinion, is climate change an imminent world threat? Why or why not? Based on your opinion, what actions do you believe should be taken to address the global warming issue?

Have a class role play about climate change, where students will be acting as members of the United Nations Framework Convention on Climate Change (UNFCCC). The role play will mimic a UN climate change summit for all Annex I and Annex II and non-Annex I parties (www.unfccc.int/parties_and_observers/items/2704.php) to come and voice their opinions to the UN Secretary-General of the United Nations and UNFCCC Executive Secretary and the supporting council. The members will listen to all aspects and opinions and come to a decision with his/her fellow councillors and decide what each country will do to decrease its carbon emissions as set out in the 1997 Kyoto Protocol. They will also need to come to an agreement that something needs to be done about climate change in the very near future; agree to a percentage cut in emissions

by 2050; and agree on how to provide money for poorer countries so they can pay for the damage caused by climate change. Each student will be given a role/organization/country to research from Oxfam's 2009 Copenhagen role play exercise (www.oxfam.org.uk/education/resources/climate_change_copenhagen/files/UN%20Conference%20role%20play%20activity.pdf). There are 14 country role descriptions, along with the council. Lobbyist groups can also be added if more roles are needed. Allow one day for preparation and one day for the role-play activity. Students will write a personal response on the role play, addressing all sides of the issue and their personal opinion. The assignment and rubric, called UN Climate Change Summit Role Play, can be found on the following pages of this guide.

THE BIG QUESTIONS/IDEAS/THEMES

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

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

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 filmmaker's 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-Viewing or Post-Viewing Activities

James photographs ice. What could you photograph on climate change that could make wonderful pictures?

How are portraits of faces and portraits of ice the same thing?

Climate change is affecting many different parts of our world. List all the ways climate change is affecting our lives.

What is the correlation between weather-related disasters and CO2 emissions?

James uses the analogy of people denying they have cavities by going to different dentists until they find one that tells them they have no cavities, even if they do. Use another analogy to illustrate people who don't want to believe climate change exists.

How are these time-lapse photos so historically important?

Why is it better to photograph glaciers at night?

Why do glaciers matter?

What role do the media play in the climate-change issue?

James is doing everything he can to expose the truths about melting glaciers around the world. Who else needs to address this issue? What needs to be done to reduce climate change? Is it too late?

Do you think individual acts are effective tools for change? Research two suggestions on what we can do.

Do you think countries need to do more in reducing their carbon emissions? What are the options?

Quotations From the Film to Explore

"The story is in the ice, somehow." James Balog, photographer

"I had this idea, the most powerful issue of our time, was the interaction of humans and nature." James Balog

"Sometime, you go over the horizon and you don't come back." James Balog

"We as a culture, we are forgetting that we are actually natural organisms and that we have this very deep connection and contact with nature. You can't divorce civilization from nature, we totally depend on it." James Balog

"What I'm here to do tonight is bring to you tangible, noticeable evidence of the immediacy of climate change itself." James Balog in a TED Talks lecture

"It's real. The changes are happening. They're very visible, they're photographable, they're measurable. There's no significant scientific dispute about that. And the great irony and tragedy of our time, is a lot of the general public thinks scientists are still arguing about that. Science is not arguing about it." James Balog

POST-VIEWING ACTIVITY: UN CLIMATE CHANGE SUMMIT ROLE PLAY

Background Information

There is now scientific agreement that climate change is caused by human activities. In 1992, countries joined an international treaty, the United Nations Framework Convention on Climate Change, to cooperatively consider what they could do to limit average global temperature increases and the resulting climate change, and to cope with whatever impacts were, by then, inevitable.

By 1995, countries realized that emission reductions provisions in the convention were inadequate. They launched negotiations to strengthen the global response to climate change, and, two years later, adopted the Kyoto Protocol. In 1997, world leaders met in Kyoto, Japan, to agree emissions cuts. These cuts were quite small and have not been met. The Kyoto Protocol legally binds developed countries to emission reduction targets. The protocol's first commitment period started in 2008 and ends in 2012. At COP17 in Durban, governments of the parties to the Kyoto Protocol decided that a second commitment period, from 2013 onwards, would seamlessly follow the end of the first commitment period. The length of the second commitment period is to be determined: it will be either five or eight years long.

Climate change is a complex problem, which, although environmental in nature, has consequences for all spheres of existence on our planet. It either impacts on-- or is impacted by-- global issues, including poverty, economic development, population growth, sustainable development and resource management. It is not surprising, then, that solutions come from all disciplines and fields of research and development.

At the very heart of the response to climate change, however, lies the need to reduce emissions. In 2010, governments agreed that emissions need to be reduced so that global temperature increases are limited to below two degrees Celsius.

You are going to join lots of other countries at a UN conference. The purpose of this summit is to plan a new global deal for tackling climate change and take a vote on what should happen next.

Format (to be presented on: _____)

1. Opening statements from the UN Secretary-General of the United Nations Ban Ki-Moon and UNFCCC Executive Secretary Christiana Figueres and then from the council
2. Annex I countries speakers: opening statement of one to two minutes for each speaker
3. Annex II countries speakers: opening statement of two minutes for each speaker
4. Non-Annex I countries speakers: opening statement of two minutes for each speaker
5. Lobbyists: opening statement of two minutes for each speaker
6. Council congregates and announces decision
7. Closing statements

As a final assessment for the role play, you will use your research and your notes from the role play to type a one- to two-page double-spaced report introducing the topic, addressing all sides of the issue and concluding with your opinion.

Due: _____. Make sure to attach your research for your role to your report.

Sources to begin with: UNFCCC <http://www.unfccc.int/2860.php>

UN CLIMATE CHANGE SUMMIT ROLE PLAY RUBRIC

Name: _____ Group: _____

Knowledge/Understanding

Concepts	2.5 2.9	3.0 3.4	3.0 3.4	4.0 5	
Clear understanding of issues	Limited success in use of geographic terms and concepts	Some success in use of geographic terms and concepts	Moderate success in use of geographic terms and concepts	Employs geographic terms and concepts with a high degree of success	/5

Thinking/Inquiry

Research	2.5 2.9	3.0 3.4	3.0 3.9	4.0 5	
Collection of Information	Information indicates limited research skills and does not include sufficient information on own topic	Information indicates moderately effective research skills on own topic	Information indicates effective research skills with most issues examined and considered	Information indicates excellent research skills with all issues thoroughly examined and considered	/5

Application

Report	2.5 2.9	3.0 3.4	3.0 3.9	4.0 5	
Accounts in writing all sides of the debate as well as a well-supported opinion (grammar, 1-2 typed pages)	Communicates in writing with limited effectiveness	Communicates in writing with some effectiveness	Communicates in writing with considerable effectiveness	Communicates in writing with a high degree of effectiveness	/5

Communication

Role Play	2.5 2.9	3.0 3.4	3.5 3.9	4.0 5	
Overall communication skills are clear and to the point; well supported points expressed with emphasis, clarity and confidence	Overall points are limited/vague; hard to understand, very little emphasis	Points are somewhat effective, with a few details; had some confidence in speech	Points and overall aim is clear; some points supported	Excellent suggestions and debating skills; research is used in speech	/5

Comments:

Total: _____/20

EXAMPLES OF CURRICULUM EXPECTATIONS

COURSE	OVERALL EXPECTATIONS
Grade 7 Geography	<ul style="list-style-type: none"> • analyze current environmental issues or events from the perspective of one or more of the themes of geographic inquiry. • describe positive and negative ways in which human activity can affect resource sustainability and the health of the environment.
Grade 7 Science	<ul style="list-style-type: none"> • assess the impacts of human activities and technologies on the environment, and evaluate ways of controlling these impacts. • investigate interactions within the environment, and identify factors that affect the balance between different components of an ecosystem. • demonstrate an understanding of interactions between and among biotic and abiotic elements in the environment.
Grade 8 Science	<ul style="list-style-type: none"> • assess the impact of human activities and technologies on the sustainability of water resources. • demonstrate an understanding of the characteristics of the Earth's water systems and the influence of water systems on a specific region.
Grade 9 Geography	<ul style="list-style-type: none"> • analyze local and regional factors that affect Canada's natural and human systems. • analyze the ways in which natural systems interact with human systems and make predictions about the outcomes of these interactions. • report on global issues that affect Canadians. • identify current or anticipated physical, social or economic changes and explain how they could affect the lives of Canadians. • explain how natural and human systems change over time and from place to place. • predict how current or anticipated changes in the geography of Canada will affect the country's future economic, social and environmental well-being. • explain how global economic and environmental factors affect individual choices.
Grade 9 Science	<ul style="list-style-type: none"> • assess the impact of human activities on the sustainability of terrestrial and/or aquatic ecosystems, and evaluate the effectiveness of courses of action intended to remedy or mitigate negative impacts. • investigate factors related to human activity that affect terrestrial and aquatic ecosystems, and explain how they affect the sustainability of these ecosystems. • demonstrate an understanding of the dynamic nature of ecosystems, particularly in terms of ecological balance and the impact of human activity on the sustainability of terrestrial and aquatic ecosystems.

COURSE	OVERALL EXPECTATIONS
Grade 9-12 English	<ul style="list-style-type: none"> • Developing and Organizing Content: generate, gather and organize ideas and information to write for an intended purpose and audience. • Understanding Media Texts: demonstrate an understanding of a variety of media texts.
Grade 11 Communications Technology	<ul style="list-style-type: none"> • demonstrate an understanding of the core concepts, techniques and skills required to produce a range of audio, video, broadcast journalism, graphic arts and printing and publishing products or services. • describe the impact of communications media technologies and activities on the environment, and identify ways of reducing their harmful effects.
Grade 11 Geography	<ul style="list-style-type: none"> • analyze the causes and effects of human-environment interactions in various ecological zones of the Americas. • evaluate the environmental and economic consequences for the Americas of natural hazards and climatic variations. • analyze local, regional and global issues related to physical geography. • explain how the Earth provides both a habitat for life and a resource for society. • evaluate the impact of natural systems on people and their activities. • evaluate the impact of human life on the environment. • explain the importance of stewardship and sustainability as guiding principles for human use of the physical environment. • explain and demonstrate the use of geotechnologies to monitor and predict change in the physical and human environment.
Grade 10 Civics	<ul style="list-style-type: none"> • analyze responses, at the local, national and international levels, to civic issues that involve multiple perspectives and differing civic purpose. • demonstrate an understanding of the various ways in which decisions are made and conflicts resolved in matters of civic importance, and the various ways in which individual citizens participate in these processes.
Grade 11 Science	<ul style="list-style-type: none"> • investigate environmental factors that can affect human health and analyze related data. • demonstrate an understanding of various environmental factors that can affect human health, and explain how the impact of these factors can be reduced. • analyze selected current environmental problems in terms of the role human activities have played in creating or perpetuating them, and propose possible solutions to one such problem. • demonstrate an understanding of the ways in which environmental factors can affect human health and how their impact can be reduced.

COURSE	OVERALL EXPECTATIONS
Grade 12 Geography	<ul style="list-style-type: none"> • analyze geographic issues that arise from the impact of human activities on the environment in different regions of the world. • evaluate approaches, policies and principles relating to the protection and sustainability of the planet's life-support systems. • explain how the Earth's natural and human systems are interconnected in multiple, complex ways. • analyze the impact of selected global trends on people and environments at the local, national, and global level. • analyze instances of international cooperation and conflict and explain the factors that contributed to each. • evaluate the social, economic and environmental impact of the strategies for sustainable development implemented by a variety of individuals, organizations and institutions. • analyze geographic issues that arise from the impact of human activities on the environment in different regions of the world. • analyze the influences that increase the interdependence of countries around the world. • evaluate the effectiveness of short-term and long-term solutions to geographic problems and issues at the local, national, and global level. • explain the influence of social, political, cultural, economic and environmental factors on human environments and activities. • analyze and evaluate interrelationships among the environment, the economy and society. • evaluate the effectiveness of international efforts to deal with global environmental issues.
Grade 12 Politics	<ul style="list-style-type: none"> • describe the main ways in which sovereign states and non-state participants cooperate and deal with international conflicts. • evaluate the role of Canada and Canadians in the international community. • describe the structure and function of international intergovernmental and non-governmental organizations. • communicate knowledge, opinions and interpretations about events, issues and trends relating to politics and citizenship, using a variety of forms of communication.

The Overall Expectations listed above are from *The Ontario Curriculum*. Complete course descriptions, including all Overall and Specific Expectations can be found at: <http://www.edu.gov.on.ca/eng/teachers/curriculum.html>.

WEBSITES AND ONLINE RESOURCES

About the Film

The official website for the film includes a trailer, poster, recent news and blogs about the film, and science links.

<http://www.chasingice.com>

Extreme Ice Survey: Founded in 2007 by James Balog, the Extreme Ice Survey (EIS) is an innovative, long-term photography project that merges art and science to give a "visual voice" to the planet's changing ecosystems. The site provides links for teachers, links to sample lessons, a glossary and fact sheets about glaciers, and a photo gallery.

<http://www.extremeicesurvey.org>

Government of Canada: The government lists its actions, information, reports and other links on climate change.

<http://www.climatechange.gc.ca>

NASA, Global Climate Change: A website with interactive data links for Arctic Sea ice cover, carbon dioxide levels, sea levels, global temperature and land ice cover offers an excellent visual resource with graphs, interactive maps and videos on global climate change.

<http://climate.nasa.gov>

National Center for Atmospheric Research: The PDF file is a lesson plan, where students examine images of alpine glaciers to develop an understanding of how glaciers respond to climate change.

http://eo.ucar.edu/educators/ClimateDiscovery/LIA_lesson4_9.28.05.pdf

National Geographic: The article titled "The Big Thaw" from June 2007 features James's work and discusses global warming and the global implications from melting glaciers.

<http://ngm.nationalgeographic.com/2007/06/big-thaw/big-thaw-text>

National Snow and Ice Data Center (NSIDC): The centre supports research into our world's frozen realms: the snow, ice, glaciers, frozen ground and climate interactions that make up Earth's cryosphere. They also manage and distribute scientific data, create tools for data access, support data users, perform scientific research and educate the public about the cryosphere. A page on educational resources includes a cryosphere glossary, a digital library and atlas,

repeat photography of glaciers, Google Earth links and print and multimedia resources. Also included are fact sheets on ice sheets, ice shelves, icebergs and arctic sea ice.

<http://www.nsidc.org>

PBS: James Balog and scientists document the runaway melting of Arctic glaciers in a *NOVA* episode titled *Extreme Ice*. Related links include Q&As with experts, interactive exploration of the seafloor and glacial satellite imagery.

<http://www.pbs.org/wgbh/nova/Earth/extreme-ice.html>

TED Talks: Includes a biography on James Balog, and links to his lectures, including one 19-minute clip titled "Time-Lapse Proof of Extreme Ice Loss."

http://www.ted.com/speakers/james_balog.html

United Nations Framework Convention on Climate Change:

In 1992, countries joined an international treaty, the United Nations Framework Convention on Climate Change, to cooperatively consider what they could do to limit average global temperature increases and the resulting climate change, and to cope with whatever impacts were, by then, inevitable.

<http://www.unfccc.int/2860.php>

U.S. Geological Survey (USGS): A page titled "Ice, Snow, and Glaciers: The Water Cycle" outlines glaciers and how water moves through the cycle.

<http://ga.water.usgs.gov/edu/watercycleice.html>

Various Links for Lesson Plan Ideas, Media Awareness, Critical Literacy and Documentary Films

Using Docs in The Classroom: A teacher librarian's personal website where there are excellent resources for teaching with documentary films.

http://www.frankwbaker.com/using_docs_in_the_classroom.htm

Media Awareness: A Canadian nonprofit media education and Internet literacy resource library.

<http://www.media-awareness.ca>

Centre 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: On this site is an area with teaching resources and short documentary films that can be used as teaching aides.

<http://www.nfb.ca>

Hot Docs' Looking at Documentaries: A teaching guide that sets out questions designed to help teachers include the study of documentary film in their curriculum. Free PDF download.

http://www.hotdocs.ca/youth/docs_for_schools_monthly/resource_materials