

A Terrible Beauty ***Edward Burtynsky*** ***and*** ***Scorned: Emily Carr***



Edward Burtynsky
Markafjot River #1
Erosion Control, Iceland, 2012
chromogenic print

Collection of the Vancouver Art Gallery, Gift of the Artist

TEACHER'S STUDY GUIDE
SPRING 2014

Vancouver
Artgallery

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Vancouver Art Gallery

Teacher's Guide for School Programs

The exhibition *A Terrible Beauty* presents a survey of large-scale photographs by the Canadian photographer Edward Burtynsky, produced over the last three decades. Together these images represent all of his major bodies of work, primarily scenes of landscapes shaped by industrial activity across the globe and his latest project on the vital subject of water. The exhibition presents awe-inspiring images that document the impact between humans and the natural world, while raising questions about our powerful role over the planet. It is presented alongside the exhibition *Scorned: Emily Carr*, which focuses on the impact of forestry and mining on the coastal landscape of British Columbia.

DEAR TEACHER:

This guide will assist you in preparing for your tour of the exhibition *A Terrible Beauty: Edward Burtynsky* and *Scorned: Emily Carr*. It also provides follow-up activities to facilitate discussion after your Gallery visit. Engaging in the suggested activities before and after your visit will reinforce ideas generated by the tour and build continuity between the Gallery experience and your ongoing work in the classroom. Most activities require few materials and can be adapted easily to the age, grade level and needs of your students. Underlined words in this guide are defined in the Vocabulary section.

The tour of the exhibition *A Terrible Beauty: Edward Burtynsky* and *Scorned: Emily Carr* has three main goals:

- to introduce students to the work of Burtynsky and Carr and their artistic practices,
- to explore Burtynsky's individual photographs within their particular contexts,
- to consider the meaning of and questions that arise from both artists' works.



Edward Burtynsky
Oxford Tire Pile #4, 1999
chromogenic print

Collection of the Vancouver Art Gallery, Gift of the Artist

BACKGROUND TO THE EXHIBITIONS:

A Terrible Beauty: EDWARD BURTYNSKY

The exhibition *A Terrible Beauty* presents a comprehensive selection of photographs Burtynsky produced between 1983 and 2013, thirty-five of which are new acquisitions generously donated by the artist in the past year. From his early series of photographs shot in British Columbia in the 1980s, to his groundbreaking new project on the subject of water and its fundamental place in the world ecology, Burtynsky's body of work is thoroughly represented. His images explore the intricate link between industry and nature, and capture the raw elements of mining, quarrying, manufacturing, shipping, oil production and recycling.

The exhibition has been organized into four sections—Inhabited, Extracted, Manufactured and Abandoned—a short list of forceful actions through which we have profoundly marked our presence on the world's land and water.

In this exhibition you will also find Burtynsky's photographs in dialogue with a smaller selection of paintings and drawings by Emily Carr, an artist who observed the impact of human industry on the natural world in some of her best-known works.

This exhibition is organized by the Vancouver Art Gallery and curated by Bruce Grenville, Senior Curator.

Scorned: EMILY CARR

The exhibition *Scorned: Emily Carr* engages in dialogue with the concurrent exhibition *A Terrible Beauty: Edward Burtynsky*, presenting works that demonstrate Carr's interest in deforestation, which was an occasional, but notable, subject of her work. The exhibition includes drawings and paintings from the Gallery's permanent collection, as well as a small selection of works borrowed from the Morris and Helen Belkin Art Gallery at the University of British Columbia. Key paintings in her oeuvre such as *Scorned as Timber*, *Beloved of the Sky* and *Above the Gravel Pit* reveal her interest in the impact of forestry and mining on the coastal landscape. Like Burtynsky, Carr observed this intervention with both horror and fascination.

Organized by the Vancouver Art Gallery and curated by Bruce Grenville, Senior Curator.

ARTIST INFORMATION

EDWARD BURTYNSKY

The Toronto-based photographic artist Edward Burtynsky is known as one of Canada's most respected photographers. He is internationally renowned for his captivating images of the natural and built environments that reflect both the impressive reach of human enterprise and the extraordinary impact of rapid industrialization.

Born in 1955 in St. Catharines, Ontario, of Ukrainian heritage, Burtynsky is a graduate of Ryerson University (Bachelor of Applied Arts in Photography) and studied graphic art at Niagara College in Welland. He connects his early exposure to the sites and images of the General Motors plant in his hometown to the development of his photographic work.

His remarkable photographic depictions of global industrial landscapes are included in the collections of over fifty major museums around the world, including the National Gallery of Canada, the Museum of Modern Art and the Guggenheim Museum in New York, the Reina Sofia Museum, Madrid, and the Los Angeles County Museum of Art in California.

Burtynsky was recognized with the TED Prize in 2005, awarded annually to a leader with a fresh, bold vision for sparking global change. The TED Prize winner receives \$1 million to make their dream become a reality. In 2006 he was named an Officer of the Order of Canada, the nation's highest civilian honour. He holds four honorary doctorate degrees and his distinctions include a National Magazine Award, the MOCCA award, the Outreach Award at the Rencontres d'Arles and the *Applied Arts* magazine book award. In 2007, Edward Burtynsky was the subject of the award-winning documentary *Manufactured Landscapes*, which screened at the Sundance Film Festival.

EMILY CARR

Born in 1871, Emily Carr was one of the most important British Columbia artists of her generation, best known for her work documenting the villages and totem poles of First Nations peoples of BC and her paintings of the forests of Vancouver Island.

Carr studied art in San Francisco, London and then France, where she was introduced to outdoor sketching along with new approaches to art making. In 1912, after her return to Canada, she travelled north, visiting First Nations villages on the Skeena River and Haida Gwaii, and produced her first major canvases of First Nations subject matter. In these works, influenced by her explorations of modernism in Europe, she used bright colours and broken brushwork. Carr offered these works for sale to the provincial government, which rejected the work on the grounds that it was not "documentary"—it was, in essence, too abstract, too specifically an artist's vision. Dejected, she returned to Victoria to make a living by running a boarding house, raising sheepdogs, making pottery and giving art lessons. Between 1913 and 1927, Carr produced very little painting.

In 1927, Carr's work was included in the exhibition *West Coast Art: Native and Modern* at the National Gallery in Ottawa. This exhibition was her introduction to other artists, particularly members of the Group of Seven, who recognized the quality of her work. In the 1930s, Carr began devoting most of her attention to landscape, particularly the forest, as her subject. These paintings express her strong identification with the British Columbia landscape and her belief that a profound expression of spirituality could be found in nature.

In the late 1930s, as her health worsened, Carr began to focus more energy on writing, producing an important series of books. They included *Klee Wyck*, a book of stories based on her experiences with First Nations people, which won the Governor General's Award for Literature in 1941. She died in 1945 in Victoria at the age of seventy-four, recognized as an artist and writer of major importance.

PRE-VISIT ACTIVITY: About the Artist: EDWARD BURTYNSKY (adaptable for all grades)

Objective:

Students explore Edward Burtynsky's background and body of work.

Materials:

- writing materials
- Artist Information Sheets (p. 7), Student Worksheet (p. 8)
- Internet: online resources listed in this study guide, Google search

Process:

1. Divide students into four groups. Give each group one of the categories from the Information Sheet (p. 7).
2. Give each student a copy of the Student Worksheet (p. 8) and ask them to consider what they need to find out to complete their section. Have them conduct research using the Internet, either at home or at school.
3. Ask each group to find and describe a piece of work by the artist and add it into the space provided in the Worksheet.
4. Have each group present their information while the rest of the students fill in their Worksheets.

Conclusion:

Discuss:

- What makes Burtynsky a significant or important artist?
- What is interesting about his work and life?
- In what ways does his work connect to or resonate with students' lives?
- What else are students interested in finding out about the artist?

Artist Information Sheet: Edward Burtynsky

His Life

- Born in St. Catharines, Ontario, in 1955
- When he was eleven years old, his father created a darkroom for him and purchased cameras and instruction manuals
- He earned a Bachelor of Applied Arts in Photography at Ryerson University, Toronto
- He studied graphic art at Niagara College in Welland
- He lives in Toronto
- He is an internationally recognized photographer

His Art

- He is known for his large-format photographs of industrial landscapes
- His most famous photographs are sweeping views of landscapes altered by industry such as mining, oil production and quarries
- His photographs capture and raise questions about the effect of industrial activity on the natural world
- He often positions himself at high vantage points over the landscape, using helicopters or elevated platforms
- Before 2007 he used a large-format field camera and large 4x5-inch sheet film, which he developed into high-resolution, large-dimension prints
- In 2007 he began using a high-resolution digital camera
- He uses remote control helicopters to position his camera at an optimal viewpoint

Major Achievements

- His work is housed in more than fifty museums worldwide, including the National Gallery of Canada, and the Guggenheim and the Museum of Modern Art in New York
- He received the TED prize of \$1 million, among many other prestigious awards
- In 2006 he became an Officer of the Order of Canada
- He holds four honorary doctorate degrees
- In 2013 his film *Watermark* won the Toronto Film Critics award

Student Worksheet: Edward Burtynsky

His Life	
Type of Art	
His Works	
Important Achievements	
A Photograph: Title & Description	

PRE- or POST-VISIT ACTIVITY: Seeing Photographically (intermediate and secondary grades)

This three-part activity can be completed in sections or as a single unit.

Objective: Students consider framing, focus and lighting in order to analyze and construct photographs.

Discussion: Edward Burtynsky, like all photographic artists, makes important choices when setting up his compositions. In this way, he achieves the effect and result he wants. For example, he decides where the photograph will be taken, from what vantage point, how the photograph will be framed and what the perimeters of the final image will be. These factors create a unique perspective that affects our reading of the photograph. The choice to highlight certain parts of the composition, to intensify or eliminate shadows, to allow direct or diffused light, is fundamental to creating any image. What is or is not included in the final frame needs to be carefully selected in order to create a tight composition.

Materials:

- assorted magazines
- paper and scissors to make a viewfinder
- cameras—one or more from home or school. If possible, one camera per group, or groups can share

Process:

Part 1:
Have the students work in pairs.

1. Looking at framing: Have students make a viewfinder by cutting a rectangle (about 3x4 inches) out of the centre of a larger sheet of paper. Have them use this viewfinder to examine various images in magazines, looking first at the whole image, then at parts of it through the viewfinder, isolating or connecting different parts of the image. Ask them to consider the following:
 - What do you see through the viewfinder?
 - How does the image change as you move the viewfinder around the image?
 - What new connections do you find?
 - What attracts your attention? Why?
2. Have students look closely at one particular image through the viewfinder. Ask: How can you use the viewfinder to carefully reframe the image? Look especially at the edges of the composition. What do you choose to focus on or edit out? Why?
3. Looking at lighting: Have students look at the lighting in different images and consider the effect of the lighting on the composition. Look at images with the following:
 - natural outdoor lighting,
 - natural and/or artificial indoor lighting,
 - strong shadows,
 - light coming from one direction.

4. Looking at focus: Have students look at the ways a change in focus can affect a photograph.

Look for images with:

- the background, the foreground or the middle ground out of focus,
- everything in sharp focus,
- everything in soft focus.

Ask: Why do you think the photographer(s) made these choices in focus?

Part 2:

1. Divide students into groups, preferably with one camera per group. Have them go outdoors and choose a scene to photograph in the following ways:
 - Changing the framing: from closer, from farther away, including more/less background—or foreground—elements.
 - Changing the lighting: in the shade, in the sun, backlit, with/without a flash.
 - Changing the focus (if camera allows): focus on something close up with the background out of focus. Then try to focus on something farther away with an object in the foreground out of focus, etc.

Part 3:

1. Either have some images printed for each group, or have students look at their digital images. Some questions for discussion:
 - What do you notice when the framing changes?
 - Is there too much/too little background?
 - Are the surrounding architectural lines/edges straight? Does it matter?
 - What kind of lighting was used?
 - Which lighting is most successful? Why?
 - What do you notice about the differently focused images? Which parts are sharply focused, softly focused, out of focus?
2. Have each group choose the photograph that they consider to be the most successful and have them discuss why.
3. Have the students show their group's chosen photograph to the rest of the class, and explain what they felt was successful about it.

Conclusion:

- Have the students discuss what they learned about composing a photograph and ask them to identify the qualities of a successfully framed photograph.

PRE- or POST VISIT ACTIVITY: Sketch and Paint (all grades)

Objective:

Students are introduced to Emily Carr’s process of working by sketching outdoors and then, back in the classroom, creating a painting based on the sketch.

Discussion:

Emily Carr often created sketches for her landscapes out in nature, where she could study the colours and textures of the trees, foliage, lakes and sky, and observe the way light, wind and weather affected her subjects. Carr began sketching in charcoal, but later developed a technique of thinning out oil paints with gasoline, which enabled her to create quick, colourful sketches. She would take the sketches she had accumulated out in the field back into the studio, and there she would make oil paintings based on—but not exactly the same as—her sketches.

Emily Carr wrote the following passage in her book *Growing Pains*:

“Outdoor study was as different from studio study as eating is from drinking. Indoors we munched and chewed our subjects. Fingertips roamed objects feeling for bumps and depressions. We tested textures, observed contours. Sketching outdoors was a fluid process, half looking, half dreaming, awaiting invitation from the spirit of the subject to ‘come, meet me half way.’ Outdoor sketching was as much longing as labour. Atmosphere, space cannot be touched, bullied like the vegetables of still life or like the plaster casts. These space things asked to be felt not with fingertips but with one’s whole self.”

Materials:

For Part 1:

- drawing pads or clipboards and sheets of paper
- pencil crayons or crayons

For Part 2:

- thicker paper for painting
- paint—preferably liquid tempera or acrylic, but any available paint will work
- paintbrushes, water in containers

Process:

Part 1:

1. Discuss Carr’s two-step process of sketching outdoors and painting in her studio. Read students the above excerpt from the writings of Carr.
2. Have students go outdoors and make a colour sketch as a precursor to making a painting. Choose an outdoor area with some greenery and one or more trees. Have the students decide on a starting perspective; for example:
 - close up, with tree trunk or branches filling the page,
 - from a distance, including grass, trees and sky,
 - looking up, including the top of the tree and an expanse of sky,
 - a single tree.
3. Encourage students to look closely at the greens and yellows of the leaves, the browns and greys of the trunk and branches, and the blues and greys of the sky. Remind them that landscape painters like Carr didn’t use just one colour, but mixed and blended colours and shades to create rich, dense surfaces.

4. Have the students make a few colour sketches from different perspectives or angles, from close up and far away. Encourage them to fill the page with quick detail—broad strokes of colours, lines and shapes that include all the elements in their line of vision.

Part 2:

1. Back in the classroom, within a week after making the sketches, have the students look at their sketches and choose the one they would most like to make a painting from. What parts of their sketch do they want to leave in? What parts would they like to change? Does the composition feel balanced, or are there some areas they would like to add something to or remove something from? Would they like to combine elements from two drawings?
2. Have the students set up workspaces at their tables, where they can see their sketches and have access to paper, paint and brushes.
3. Have them paint their new landscapes. Encourage them to fill the page, layering on and blending colours as they work.

Conclusion:

- Display the students' paintings alongside their sketches.
- Have them look at the work and talk about the similarities and differences in materials, location, colours, shapes and compositions.
- Discuss the process, how easy or hard it was to create the work, the differences between making the sketch and creating the painting, and the process of changing media and reworking an idea.
- Ask students if any of the sketches could stand alone as finished works. Do they prefer any of their sketches to their final paintings? Why or why not?

PRE-VISIT ACTIVITY: Finding Beauty in the Unexpected (intermediate to secondary grades)

Objective:

Students explore taking interesting and visually appealing photographs of unlikely subject matter.

Discussion:

When we consider artistic photography, we often think of beautiful images as separate from images of devastation and ruin. Interestingly, Edward Burtynsky's work captures the uneasy balance between environmental destruction and visual splendour. His photographs present highly expressive visions that find beauty and humanity in the most unlikely of places. Through his work, he captures incredibly rich detail and creates order out of the chaos of "ruined" environments.

Materials:

- cameras—one or more from home or school. If possible, one camera per group. or groups can share
- printer

Process:

1. Discuss and ask students about the concept of finding beauty in the unexpected in their everyday lives. Examples might include oil in a puddle, power lines, rows of coats and shoes, cracks in the ground or walls, spilled milk, graffiti, parked cars.
2. Divide students into pairs.
3. With their partners, have students discuss ideas about photographing an interesting and unexpected image in the classroom or on the school grounds.
4. Have students choose a scene and photograph it while considering the factors provided in the above activity, *Seeing Photographically*, p.9.
5. If possible, have students print their photographs and present their work to the class.

Conclusion:

Discuss:

- How has the students' perspective of photography changed?
- At what point do photographs of the unexpected become art? How does this happen?
- What were some of the most interesting things that students learned or discovered?
- Can students find any other photographs that capture beauty or order in the unlikely?

PRE-VISIT ACTIVITY: The Industrial Landscape (all grades)

Objective:

Students learn about specific industrial terms to enhance their understanding of the industrialized world and Edward Burtynsky's subject matter.

Discussion:

The focus of Burtynsky's work is the global industrial landscape and its intricate involvement with nature. From oil sands to open-pit mines, his photographs depict the diverse technologies that exist in the largely unknown world of industrial production. When considering these industries and the environmental deterioration they cause, assuming the position "out of sight, out of mind" can have dire consequences. Raising awareness and understanding is key to inspiring new and improved technologies and environmental awareness.

Materials:

- Information sheet (p. 15)
- Student Worksheet (p. 16)
- access to the Internet: Wikipedia, Google search, etc.
- printer, at school or at home

Process:

1. Divide students into pairs.
2. Assign an industrial term to each pair and provide them with a Student Worksheet (p. 16). Definitions for these terms are provided for teacher reference on pp. 22–23 of this guide.
5. Have students conduct research using the Internet, either at home or at school.
3. Have them fill in their Worksheets.
4. Students should provide at least three facts about what it is, one example of where it exists, and at least two examples of how the environment is affected.
5. Have students find a Burtynsky photograph that shows their assigned topic.
6. If possible, print images at home or at school.
7. Have students present their research to the rest of the class.

Conclusion:**Discuss:**

- Did students learn something new about the industrial world? How has their perception changed?
- What are some ways students can raise awareness about what is happening in the industrialized world?
- How can students take better care of the environment in their own lives?

List of Research Words:

1. Oil Sands
2. Oil Refinery
3. Oil Field
4. Open-Pit Mining
5. Rice Terraces
6. Tailings (e.g. Nickel and Uranium)
7. Erosion Control
8. Tire Piles / Tire Fire
9. Quarry
10. Marine Aquaculture / Aquafarming
11. Dryland Farming
12. Centre Pivot Irrigation
13. Step Wells
14. Steel Mill
15. Ferrous Scraps / Bushlings

Student Worksheet: Industrial Landscapes

Your topic:	
What is it?	
Where can it be found?	
How does it affect or change the natural environment?	
Burtynsky photograph Title:	

PRE-VISIT ACTIVITY: Three Gorges Dam Debate (intermediate and secondary grades)

Objective:

Students learn about the Three Gorges Dam in China and the controversy surrounding its construction. Students take on the roles of people whose lives may be affected by the dam and participate in a debate about it.

Discussion:

Among his many adventurous projects to photograph extraordinary landscapes, Burtynsky travelled to the construction site of the Three Gorges Dam, the world's largest hydroelectric engineering project, located on the Yangtze River in the People's Republic of China. This colossal project is designed to stop the seasonal flooding of China's largest river and to provide hydro-electric power for the country's rapidly growing manufacturing industries. However, the social and environmental consequences of the controversial \$180 billion Three Gorges project cannot be ignored. As the largest dam ever attempted, it has uprooted over one million people and flooded numerous cities, towns and villages. With the *Three Gorges Dam Project*, Burtynsky continues his exploration of the relationship between man, nature and industry.

Materials:

- information sheet (p. 15)
- access to the Internet: Wikipedia, Google search, etc.
- printer, at school or at home

Process:

1. Introduce the lesson by familiarizing students with the Three Gorges Dam. Useful information and various opinions can be found at <http://www.pbs.org/itvs/greatwall/story.html>.
2. Draw two columns on the board, headed "Pros" and "Cons."
3. Brainstorm with the class the potential benefits of the Three Gorges Dam. Examples may include flood control, electricity, renewable power that replaces coal, reliable water supply, tourist attraction, improved economy. Write the students' responses in the "Pros" column.
4. Brainstorm with the class the possible drawbacks of the dam. Examples may include loss of homes and farmland, environmental problems, impact on cultural and geographical resources representing China's historic past, rise in water-borne diseases, loss of fish. Write the students' responses in the "Cons" column.
5. Ask the students to list all the jobs they can think of that might be affected by the construction of the dam: farmers, construction workers, financial advisors, engineers, archaeologists, environmentalists, government officials, tourists, etc.
6. Tell the students that today some of them will assume the roles of people who are affected by the dam construction. They will present their viewpoints in an informal debate. Students who don't assume roles will participate as audience members deciding which side presents the strongest arguments.
7. Roles might include the following:

FOR:

The Chinese government
Shipping companies
Dam builders
Hydro-electric power companies
People who have lost loved ones due to past flooding
Clean energy advocates

AGAINST:

Farmers forced to relocate

Environmentalists

Archaeologists

Geologists

The Yangtze River dolphin (now extinct)

8. Pass out the role cards to nine students. Have these students study their roles and determine whether they hold pro or con positions. Each of these students should be prepared to share that position and to support his or her viewpoint. Allow time for role players to read their roles and prepare brief arguments. (This may be given as homework if time is limited.) The remaining students are the debate audience. Pass out a sheet of paper to all audience members. Tell them that while the debaters are presenting their viewpoints, they are to take notes on each position and determine who makes the strongest arguments.
9. When the role players are ready to present, divide them into two groups: those in favour of the dam construction, “the Pros,” and those against the construction, “the Cons.” Have the Pros present their arguments first, followed by the Cons. Inform the speakers of the following guidelines:
 - Each student must stand to present his/her point of view.
 - Each student must share what he or she does for a living before presenting the viewpoint.
 - Only one person may speak at a time.
 - Students will respect others with active listening.
10. When all the role players have presented their viewpoints, encourage questions from the audience. Role players should respond to questions as their characters would.

Conclusion:

- Did students learn something new about water ecology and dams? If so, what?
- How has their perception changed?
- What are their thoughts about the activity? Was it challenging? Interesting? Fun?
- Have students seen a dam before? Where? Bring to the students’ attention the existence of the Capilano Dam in North Vancouver.

Source for activity: www.learnnc.org

PRE-VISIT ACTIVITY: Water Works (all grades)

Objective: Students consider individual and global water use and create a promotional poster about water conservation.

Discussion: Many of the pictures in this exhibition are drawn from Edward Burtynsky's new body of work, begun in 2008, called *Water*. In his own words:

"I wanted to understand water: what it is, and what it leaves behind when we're gone. I wanted to understand our use and misuse of it. I wanted to trace the evidence of global thirst and threatened sources. Water is part of a pattern I've watched unfold throughout my career. I document landscapes that, whether you think of them as beautiful or monstrous, or as some strange combination of the two, are clearly not vistas of an inexhaustible, sustainable world."

Canadians are among the world's most prodigious water users. Given that only 3 percent of the earth's water is fresh water, and that most of this is frozen in glaciers and polar ice, it is essential to find ways to conserve this precious resource.

Materials:

- Student Worksheet (p. 20)
- Global Awareness Fact Sheet (p. 21)
- poster board or large-format paper
- construction paper
- magazines
- markers
- glue
- scissors

Process:

1. Discuss how students use water in their everyday lives and how water is used around the world
2. Give each student a copy of the Student Worksheet (p. 20) and the Global Awareness Fact Sheet (p. 19)
3. Ask students to think about their individual water usage, read the Global Awareness Fact Sheet and fill out their Worksheets as homework. See Worksheet below.
4. Have the students work individually or in pairs to create a promotional collage poster about conserving water, using magazine images, markers and construction paper.
5. Have students present their posters to the rest of the class.
6. Display the posters in the classroom or school.

Conclusion:

Discuss:

- Did students learn something new about water? How has their perception changed?
- What are some ways students can raise awareness about conserving water locally and globally?
- How can students take action to conserve water use in their own lives?

Student Worksheet: Water

Together with your family, list as many uses for water as you can. Does your family use water differently in the summer and winter months? Next, identify your family's top 5 uses and list below.

<p>The ways our family uses water:</p>
<p>My Family's Top 5 Uses of Water (In order of importance to us)</p> <ol style="list-style-type: none">1.2.3.4.5.
<p>Talk with your family about people who live in developing countries who may not have flush toilets, washing machines, dishwashers or any running water in their homes. Do you think people without running water use water differently than your family? How?</p>

GLOBAL AWARENESS FACT SHEET

- All living creatures, including humans, need water to survive
- Many people living in other countries die because they the water they drink makes them sick
- Conserving water helps to preserve the planet's natural resources
- Less than 1 percent of the world's fresh water is readily accessible for direct human use
- Despite all the water in the world, only a small amount is available to humans and other creatures that depend on fresh water
- 2.6 billion people in the world lack basic sanitation resources, such as wastewater treatment centers
- Protecting freshwater resources is difficult because many rivers, lakes and underground aquifers cross national boundaries
- The earth has a limited amount of water. The same water keeps going around and around the planet in a process called the water cycle
- Poor people often pay more for water than wealthy people living in the same city
- A person needs 4 to 5 gallons of clean water per day to survive
- Salt water accounts for more than 97 percent of the water on Earth
- A person can live weeks without food, but only about three days without water
- Water can travel from one part of the world to another through the water cycle
- More than 700 gallons of water are needed to grow the cotton for just one T-shirt
- Millions of women and children spend several hours a day collecting water
- All people need access to safe drinking water and improved sanitation conditions to keep their water clean
- Human activities affect water quality all over the world
- People living in water-rich regions can affect how people use water in water-deprived areas
- In many parts of the world, fresh water is being used faster than it can be replaced
- Many people in the world suffer from health problems caused by drinking dirty water

VOCABULARY

abstract: a style of art that can be thought of in two ways:

- The artist begins with a recognizable subject and alters, distorts, manipulates, or simplifies elements of it;
- The artist creates purely abstract forms that are unrecognizable and have no direct reference to external reality (also called non representational art).

centre pivot irrigation (also central pivot irrigation, circle irrigation): a method of crop irrigation in which equipment rotates around a pivot and crops are watered with sprinklers. A circular area surrounding the pivot is irrigated, often creating a circular pattern in crops when viewed from above. Most centre pivots were initially water-powered, and today most are propelled by electric motors.

dryland farming: an agricultural technique for non-irrigated cultivation of drylands. It is practiced in arid areas without irrigation by planting drought-resistant crops and maintaining a fine surface mulch that protects the natural moisture of the soil from evaporation.

erosion control: the practice of preventing or controlling wind or water erosion in agriculture, land development and construction. Effective erosion controls are important techniques in preventing water pollution and soil loss. The controls often involve the creation of a physical barrier, such as vegetation or rock, to absorb some of the energy of the wind or water that is causing the erosion.

ferrous scraps/bushling: scrap metal that contains some amount of iron, as compared to non-ferrous metal, which contains no iron. Ferrous scrap is processed by the scrap-recycling industry into commodity-grade steel.

large-format photography: any photographic imaging format 4×5 inches (102×127 mm) or larger. The main advantage of large-format, film or digital, is higher resolution.

marine agriculture (also aquafarming): the farming of aquatic organisms such as fish, crustaceans, mollusks and aquatic plants. It involves cultivating freshwater and saltwater populations under controlled conditions.

oil fields: a region with an abundance of oil wells extracting petroleum (crude oil) from below ground. Because oil reservoirs typically extend over a large area, as broad as several hundred kilometres across, full exploitation entails multiple wells scattered across the area.

oil refinery (also petroleum refinery): an industrial process plant where crude oil is processed and refined into more useful products such as petroleum naphtha, gasoline, diesel fuel, asphalt base, heating oil, kerosene and liquefied petroleum gas. Oil refineries are typically large, sprawling industrial complexes with extensive piping running throughout, carrying streams of fluids between large chemical processing units.

oil sands (also tar sands or, more technically, bituminous sands): a type of unconventional petroleum deposit. The oil sands are loose sand or partially consolidated sandstone containing naturally occurring mixtures of sand, clay and water, saturated with a dense and extremely viscous form of petroleum technically referred to as bitumen (or, colloquially, tar due to its tar-like appearance, odour and colour). Natural bitumen deposits are reported in many countries, but are found in extremely large quantities in Canada.

open-pit mining (also open-cut mining, opencast mining): a surface mining technique of extracting rock or minerals from the earth by removing them from an open pit or burrow.

quarry: a place from which dimension stone, rock, construction aggregate, riprap, sand, gravel or slate has been excavated from the ground. A quarry is distinctly different from an open-pit mine, from which minerals are extracted. For example: limestone, a sedimentary rock, is quarried; whereas the lime, a mineral, is mined.

rice terraces: a piece of sloped plane that has been cut into a series of successively receding flat surfaces or platforms, which resemble steps, for the purposes of more effective rice farming. Graduated terrace steps are commonly used to farm crops on hilly or mountainous terrain. Terraced fields inhibit erosion and reduce surface runoff, and may be used to support crops that require irrigation, such as rice.

steel mill (also steelworks): an industrial plant for the manufacture of steel.

step well: a well or pond in which the water may be reached by descending a set of steps. Step wells may be covered and protected and are often of architectural significance.

survey: a detailed and comprehensive study or examination.

tailings (also mine dumps, culm dumps, slimes, tails, refuse, leach residue, slickens): the materials left over after the process of separating the valuable fraction from the non-valuable fraction of an ore such as nickel or uranium.

tire fire: a fire that starts in a tire pile and burns, in one of two forms: a fast-burning event, burning out of control almost immediately, or slow-burning pyrolysis, which can continue for over a decade. Tire fires are noted for being difficult to extinguish. Such fires produce a lot of smoke, which often carries toxic chemicals from the breakdown of rubber compounds released by burning.

tire pile: a site where discarded tires are stored, dumped or processed.

RESOURCES

Print:

Pauli, Lori, et al., *Manufactured Landscapes: The Photographs of Edward Burtynsky*. Ottawa: National Gallery of Canada/New Haen CT: Yale University Press, 2003.

Online:

www.amnh.org

www.anbakam.com/product.html

www.bced.gov.bc.ca/

<https://www.brooklynmuseum.org>

www.edwardburtynsky.com

www.learnnc.org

<http://news.nationalgeographic.com>

www.pbs.org

www.ted.com

<http://water.org>

www.wikipedia.org

Video links:

Ted Talk: Manufactured Landscapes (34min 28sec)

http://www.ted.com/talks/edward_burtynsky_on_manufactured_landscapes.html

Where I Stand: A Behind the Scenes Look at Edward Burtynsky's Photographic Essay, *Water* (9min 41sec)

<http://www.youtube.com/watch?v=mmwgqxc-7eY#t=231>

Photographer Edward Burtynsky in Studio Q (17min 14sec)

<http://www.youtube.com/watch?v=cdQNR1d2Eok>

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