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CLIMATE IMPACT MAP · CLASSROOM EDITION · BRITISH COLUMBIA 🍁

LESSON PLAN · GRADES 7–9 · BRITISH COLUMBIA

Indigenous Communities & Climate Justice: A Vancouver-Centred Investigation

📚 Grades 7–9 (ages 12–15) ⏱ 75 minutes 📍 British Columbia

🌐 theclimateimpactmap.com 🗓 [Date]

🌍 Required Tool: Climate Impact Map

This lesson is built around hands-on use of Climate Impact Map (theclimateimpactmap.com). Students should spend the majority of class time actively exploring the map. Ensure all students have device access before the lesson begins. Classroom licence unlocks all IPCC AR6 scenarios, storm surge, and infrastructure overlays.

Learning Objectives

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

1. Describe the key IPCC AR6 sea level rise scenarios and explain the difference between SSP pathways.
2. Use Climate Impact Map to identify flood risk for communities in British Columbia, including Vancouver.
3. Explain how indigenous communities & climate justice affects people, infrastructure, and ecosystems differently based on location and socioeconomic status.
4. Connect global climate data to local risk in British Columbia using real NASA and IPCC datasets.

5. Reflect on the relationship between climate science and Indigenous knowledge traditions in this region.

Materials & Setup

- **Climate Impact Map** — theclimateimpactmap.com (Classroom licence required for full access)
- Device per student or per pair (tablet, laptop, or desktop)
- Student observation worksheet (create or adapt from this lesson plan)
- Whiteboard or shared digital document for class discussion
- Optional: printed map of Vancouver and surrounding region for reference

Teacher prep: Before class, navigate to theclimateimpactmap.com and confirm Classroom access is active. Pre-load the map centred on Vancouver and test all scenario buttons referenced in the Main Activity.

Background for Teachers

> 🛰️ **Live NASA Data Integration:** Climate Impact Map displays live Arctic and Antarctic sea ice extent from NSIDC (updated weekly) and active fire detections from NASA FIRMS VIIRS (updated every 24 hours). The Stats panel in the app shows current anomalies versus the 1981–2010 baseline. Reference this data during your introduction to ground the lesson in current conditions.

Indigenous communities around the world face disproportionate climate impacts despite contributing minimally to historical greenhouse gas emissions. Coastal and Arctic Indigenous communities are often the first to experience the effects of sea level rise, permafrost thaw, changing sea ice patterns, and extreme weather. In Canada, many First Nations reserves are located on low-lying coastal or riverine land, often without the financial resources for adaptation that larger urban centres possess. In the United States, the Isle de Jean Charles Band of Biloxi-Chitimacha-Choctaw in Louisiana became one of the first communities in North America officially displaced by climate change.

Indigenous knowledge systems — accumulated over thousands of years of careful observation of land, water, and sky — offer invaluable perspectives on environmental change that Western science is only beginning to formally recognize. Inuit hunters' observations of changing sea ice patterns, First Nations fishers' records of salmon run timing, and Indigenous farmers'

knowledge of shifting seasons all constitute forms of climate data that predate modern instrumentation by centuries.

Climate Impact Map's data shows many Indigenous territories at high risk under current sea level rise projections. The tool can be used to visualize specific community-level risk while centering the human stories behind the data.

Local context — British Columbia: Metro Vancouver's Fraser River delta and Richmond sit at or below sea level, making them among Canada's most flood-vulnerable urban areas.

Lesson Plan

Introduction (11 min)

Begin by asking students: *"What would happen to Vancouver if sea levels rose by 1 metre? By 7 metres?"* Allow 2–3 minutes of discussion. Do not correct or confirm answers yet — capture predictions on the board.

Briefly introduce Climate Impact Map: explain that it uses real GEBCO terrain elevation data, IPCC AR6 projections, and live NASA satellite data. Show the Stats panel briefly to demonstrate that the tool connects to real-time observations.

Frame the lesson: today students will use the same data that climate scientists and emergency managers use to assess flood risk — and they will ground it in the specific geography of British Columbia.

Main Activity — Climate Impact Map Exploration (41 min)

Have students open Climate Impact Map on their devices. Walk through the interface briefly (scenario panel, overlays, Cities tab, click-to-explore). Then proceed through the following steps:

1. **Identify Indigenous territories at risk**

   Using Climate Impact Map with **SSP2-4.5 (+0.6 m)** active, navigate to coastal areas near your region. Research which Indigenous territories or reserves exist in these zones using resources like native-land.ca.

2. **Escalate scenarios**

   Apply **SSP5-8.5 (+1.0 m)** and then **Greenland Melt (+7 m)**. For each scenario, note which additional Indigenous territories would be affected.

3 **Storm surge + Indigenous territory**

Place a storm surge origin near an Indigenous coastal community in your region. Apply Cat 3 surge. What is the inundation area? Who lives there?

4 **Climate risk score**

Click on the location of an Indigenous community in your region. Record the 5-metric climate risk score (drought, heat, flood, storm, wildfire). What does this composite tell you about the community's vulnerability?

5 **Live fire data**

Enable the **Live NASA Fires** overlay. Are any active or recent fires near Indigenous territories? Research one recent wildfire that affected an Indigenous community.

6 **Compare risk profiles**

Use the Cities tab to compare the risk profile of a major urban centre in your region with a rural Indigenous community in a similar geographic area. What differences do you observe?

Discussion & Analysis (15 min)

Bring the class together. Use the following discussion questions to deepen analysis and connect data to broader themes:

- Why do Indigenous communities often face higher climate risks than surrounding non-Indigenous populations?
- How does Indigenous traditional ecological knowledge complement or challenge Western scientific climate data?
- What does "climate justice" mean in the context of Indigenous communities? Who is responsible for adaptation costs?
- How should Indigenous sovereignty rights factor into climate adaptation planning? Who should make decisions about relocation?

Closing & Exit Ticket (8 min)

Ask students to complete a brief exit ticket (written or verbal) responding to: *"What is one thing you learned today that surprised you, and one question you still have?"*

Collect responses to inform follow-up instruction. Consider sharing standout observations in the next class as a warm-up.

Indigenous Knowledge & Indigenous Communities & Climate Justice

The land on which Vancouver stands is the traditional territory of the Musqueam, Squamish, Tsleil-Waututh, and other Coast Salish peoples. Climate change is not an abstract future threat to Indigenous peoples — it is a present reality reshaping relationships with land, water, and community that have been sustained for thousands of years.

Traditional ecological knowledge held by Indigenous peoples in this region provides a long-term record of environmental change that predates Western scientific instrumentation by centuries. Changes in seasonal timing, species behaviour, water levels, and weather patterns observed by knowledge keepers offer invaluable context for interpreting Climate Impact Map data.

When using Climate Impact Map to explore indigenous communities & climate justice scenarios, consider: whose land are you mapping? Whose communities appear in the flood zones? How does Indigenous land stewardship — including practices like cultural burning, salmon habitat management, and coastal resource governance — relate to climate resilience?

Reflection Prompt

How can Western scientific data (like IPCC AR6 projections and NASA satellite data) and Indigenous traditional ecological knowledge complement each other in understanding and responding to climate change? What would it look like to genuinely centre Indigenous voices in climate adaptation planning for this region?

Suggested resource: Consult the First Peoples' Cultural Council (BC), Ontario Native Education Counselling Association, or your region's tribal nation websites for climate-related traditional knowledge resources.

Assessment Rubric

Criteria	Beginning (1)	Developing (2)	Applying (3)	Extending (4)
Interprets IPCC scenario data accurately	Shows limited understanding; requires significant support to complete tasks.	Shows basic understanding; completes tasks with some guidance and occasional errors.	Demonstrates solid understanding; completes tasks independently with minor errors.	Demonstrates thorough understanding; extends thinking beyond task requirements with insight.
Identifies and explains regional vulnerability	Shows limited understanding; requires significant support to complete tasks.	Shows basic understanding; completes tasks with some guidance and occasional errors.	Demonstrates solid understanding; completes tasks independently with minor errors.	Demonstrates thorough understanding; extends thinking beyond task requirements with insight.
Uses CIM tools to gather and record evidence	Shows limited understanding; requires significant support to complete tasks.	Shows basic understanding; completes tasks with some guidance and occasional errors.	Demonstrates solid understanding; completes tasks independently with minor errors.	Demonstrates thorough understanding; extends thinking beyond task requirements with insight.
Connects data to policy and community impact	Shows limited understanding; requires significant support to complete tasks.	Shows basic understanding; completes tasks with some guidance and occasional errors.	Demonstrates solid understanding; completes tasks independently with minor errors.	Demonstrates thorough understanding; extends thinking beyond task requirements with insight.

Extension Activities

1. Research a specific Indigenous community that has been or is being displaced by climate change (Isle de Jean Charles, Newtok Alaska, Tuktoyaktuk NWT, etc.). Document their story and the policy responses in a 3-page report.

2. Interview an Elder, Indigenous knowledge keeper, or community climate advocate (in person or through published interviews/videos) about climate change observations. Compare their observations with Climate Impact Map data for their territory.
3. Develop a policy brief recommending how climate adaptation funding in your country should be restructured to prioritize Indigenous community resilience. Ground it in both Climate Impact Map risk data and Indigenous rights frameworks.

Curriculum Connections

Curriculum Standard: British Columbia Ministry of Education — Science, Social Studies, Environmental Learning

This lesson addresses outcomes related to: Earth and environmental science; climate systems and human impact; geographic inquiry and spatial thinking; data literacy and scientific reasoning; social justice and equity in environmental contexts; Indigenous perspectives and land relationships.

Cross-curricular connections: Social Studies (geopolitics of climate change), Mathematics (data interpretation, percentages, scale), Language Arts (persuasive writing, research), Indigenous Education.