Teaching Unit Number 3 - Extreme Events.

Network in Canadian History and Environment (NiCHE) - Environmental History
David Brownstein, Klahanie Research Ltd.

Creative Commons Attribution-NonCommercial-ShareAlike 4.0
International Public License

This university-level teaching unit is designed to be easily scaled up or down regarding class time consumed, or difficulty, as appropriate for the individual course context. The material in this unit has a strict focus on Canada (specifically Québec), though instructors in other locations are encouraged to improvise on their own, using this module as a base, to insert a comparative element and make connections to other places or themes.

Learning goals.
- Introduce the theme of natural hazards perception, and how these perceptions may change through time
- Contextualize the emergence of state funded river management
- Familiarize the student with archival sources that inform narratives of environmental change
- Encourage students to connect these concepts with their own experience of the world

This teaching unit is composed of five resources:
- An open source journal article, to be assigned as a reading
- Discussion questions focused on the reading
- A contextual essay, around which instructors can build their own lectures or share with Teaching Assistants working outside their area of expertise
- Primary sources, including maps, drawings and photographs, to be deployed as best suits the purposes of the instructor
- A glossary of “Canadian” terms and concepts, to support a non-Canadian, international audience

Resources:

2) Article Discussion Questions
Q. Before having read this piece, have you encountered the term “nature/culture”
boundary? Castonguay does not invoke this term, but it is fundamental to his argument. How so?

Q. What does Castonguay mean when he speaks of the “social production” of natural catastrophes? How is the social production of a disaster different than the actual event of flooding? Who are its authors, and what motivates its production and perpetuation? Cite and explain with examples from the St. Francis River region.

Q. What was the “positive corollary to the non-navigability of the Eastern Townships rivers”?

Q. How did industry driven modifications to the St. Francis River render the riverine populations vulnerable? Consider changing perceptions toward flood and drought risks, responsibility for risk management, ability to respond, and liability for damages in your response.

Q. Why was the construction of large dams to regulate water flow, and the erection of retaining walls, not a successful approach in the prevention of flooding in the St. Francis River drainage basin? By contrast, why was a more holistic approach, which would have employed more control dams, rejected? How did the earlier decisions constrain the later ones?

Q. Compare the effects of industry on the environment of the riverine population with the environmental and human impact of industry from one of the other articles in “Teaching EH: Canada” series. <http://environmentalhistory.net/teaching-eh/canada-in-context/> Consider the similarities and differences. What are some of the recurrent themes?

Q. Castonguay primarily treats industry and the economic class as a privileged population distinct from the riverine residents, suggesting each to have a discrete set of interests. However, local industries necessarily would have employed local employees, and local energy producers would have supplied local consumers. Is the relationship between these populations and their views on flood management, more complex than Castonguay acknowledges? Consider a broader spectrum of views on the flooding situation, and why these positions may have been embraced.

3) Contextual Essay
Castonguay explores the perceptions of flood events on the St. Francis River, Québec, and how over the course of the latter nineteenth and twentieth centuries, popular adjustments to floods came to be replaced by increased vulnerability to events then perceived as catastrophic. In this way, Castonguay's historical narrative is “yet another instance of the social production of natural catastrophe” inspired by the pioneering work of American Geographer, Gilbert F. White (1911-2006).

White's work can be summarized by the phrase “Floods are 'the acts of God,' but flood
losses are largely the acts of man.”¹ White came to this conclusion through his study of increasingly expensive, but decreasingly effective large-scale American flood control works. Americans had suffered through significant environmental extremes through the 1920s and 1930s.² The American federal government adopted an interventionist stance, funding large-scale Depression-era public works projects that sought to minimize flood catastrophe and the subsequent human hardship. White's 1945 doctoral dissertation, “Human Adjustment to Floods” detailed the breadth of choices available to people when confronted with flood hazards and uncertainty. Government policy was then focused on a limited repertoire of flood abatement engineering works and managing upstream land uses, certain types of emergency measures, and public relief. White concluded that public policy needed to change to encompass a much wider array of adjustments. He did so based on observations that investment in engineering works created overconfidence, leading to a false sense of security, particularly when flood waters ultimately breached those heightened defenses, resulting in even greater losses. “In the light of meager evidence, it seems possible that reservoirs and channel improvements, unless supplemented by land-use measures, may induce or promote further encroachment upon a flood plain, and so may increase rather than decrease mean annual losses.”³

When applied to the St. Francis River, Québec, Castonguay explores the local experience of a more general pattern shared quite widely. He locates himself in the broader literature by identifying three descriptive trends: that academics have understood natural catastrophes as being the product of social structures (in which the poor or minorities are inordinately affected), human action (in which flooding is an unanticipated by-product of attempts to harness nature) or elite discourse (in which ruling elites attempt to hide the role of human interventions in creating natural disasters, legitimating the disproportionate distribution of risks).

Traditionally, local St. Francis riverine populations tolerated fluctuations in river flow—indeed, they expected it, and behaved accordingly. Unlike the local population, emerging captains of industry could not tolerate flow irregularities. This connection between industry and the river superseded the relationship between local riverine populations and the river.

Previously, industrialists had not been vocal in times of flooding, except when they were forced to defend themselves against accusations that their activities had contributed to, or worse, created, a flood event. With increased industrialization via damming and hydro-generation, industrialists came to view flooding as waste; as potential power not generated. Municipal leaders saw hydropower as central to their strategies for economic


³ White, 206.
development. The irregular river flows affected all local industrial activities including logging, sawmills and paper mills, textile mills, etc. Construction of dam reservoirs at the St. Francis headwaters would enable the storage of water (future potential energy) otherwise lost by the power plants downstream. The flood of 1913 mobilized economic and political authorities to also address the problem of low water. By funnelling excess spring water into storage, it could be saved for times of subsequent drought. Droughts, Castonguay argues, contributed to changing perceptions of these extreme events; they were crucial to the production of flooding as a “natural catastrophe.”

By the 1940s inhabitants of the St. Francis River valley had become unaccustomed to floods and attitudes to erratic flows generated even greater demands for public safety. Citizens no longer kept a vigilant eye on the river, searching for cues that flood danger was immanent. Instead they devoted their energies to pursuing claims for protection and subsequent government reparations after flood events. In time, citizens lost faith in engineering solutions to flood damage, and they grew suspicious of any modifications to the landscape that might disturb the river's flow. Responsibility was passed up levels of government until it extended beyond the flood area proper. Eventually responsibility, and expertise, left the area entirely. Governments began to manage river flow separately from the river's ability to generate electricity, since that center of gravity had by then moved north of the St. Lawrence River. Castonguay concludes by observing that while riverine inhabitants had lost their previous local methods of coping with floods, they acquired an understanding of the fallibility of flood management schemes. This latter point extends Gilbert White's seminal work, by recognizing the dangers in becoming overly reliant upon the state for flood protection and subsequent restitution.

4) Primary Sources


Old Bridge over the St. Francis River, Sherbrooke, Que.; New Bridge over St. Francis River, Sherbrooke, Que., postcard 190?.


Scene on the river St. Francis near Sherbrooke, by W.H. Bartlett, 1840.

Map of a part of the River St. Francis shewing the depth of water from the mouth to one mile above Pierreville village. 1874. [cartographic material].

Sketch shewing position of posts, booms & path in connection with Abenakis Reserve, River St. Francis, Prov. of Quebec, 1883 [cartographic material].

St. Francis River, as photographed by William James Topley, 1912.

5) Glossary
Eastern Townships: A region located in south-central Québec, between Montréal and Québec City. The northern boundary is roughly the geological boundary between the St Lawrence lowlands and the Appalachian Mountains (look for Drummondville on a map). The southern boundary is represented by the Canada – US border (Vermont, New Hampshire and Maine). Originally inhabited by the Abenaki First Nations, the American Revolution saw English-speaking loyalists leave the US for this area (among others).
After 1840 the region experienced significant French colonization, and by the 1880s Francophones had become the majority population.

Floodplain: A relatively flat surface alongside the channel of most rivers, it extends outwards from the river itself to the base of the river valley walls. It is so called because the plain is periodically inundated during flood events. Gilbert White defined the floodplain as “that land outside of a stream channel described by the perimeter of the probable limiting flood. It is land which is not covered by the stream at low flow or average flow, but which has been flooded in the past or may be flooded in the future. It has no other essential feature; it may be broad or narrow, frequently flooded or rarely flooded. In this sense, every stream which has floods also has a flood plain” (p 44).

Lower Canada (as opposed to Upper Canada): In present day understanding, this should be read as a synonym for “Québec.” Historically, it was the southern portion of present-day Québec, having been created in 1791. Lower Canada was abolished in 1841, upon amalgamation with adjacent Upper Canada (present day Southern Ontario) to form the united Province of Canada. The upper and lower refer to the relative distance away from the headwaters of the St. Lawrence River.

Portage: A term from when most long-distance travel in Canada took place by canoes on water, rather than overland. Portage refers to either the place, or the practice of carrying a canoe and goods over land between navigable stretches of water. This might be necessary to get around an interruption, such as a waterfall or rapids, or when two adjacent lakes are not connected.

Riparian: Of, relating to, or situated on, the banks of a river; riverine. Frequently with reference to the rights of ownership of a riverbank, or when used in an ecological sense, meaning the transitional zone between dry land and running water.

Hydrography: The scientific description of water on the earth's surface, including the mapping of seas, lakes and rivers.

Hydrology: The science that examines water, its properties and laws, its distribution over the earth's surface, etc.

Vernacular: Can refer to the indigenous language of an area, or it can imply the ordinary and domestic.
Many thanks to:
Dr. David Brownstein, Klahanie Research Ltd. (http://www.klahanieresearch.ca/)
NiCHE (http://niche-canada.org/)
Oxford University Press (oup.com)
National Film Board of Canada (https://www.nfb.ca/)
American Society for Environmental History (aseh.net)
Forest History Society (foresthistory.org)