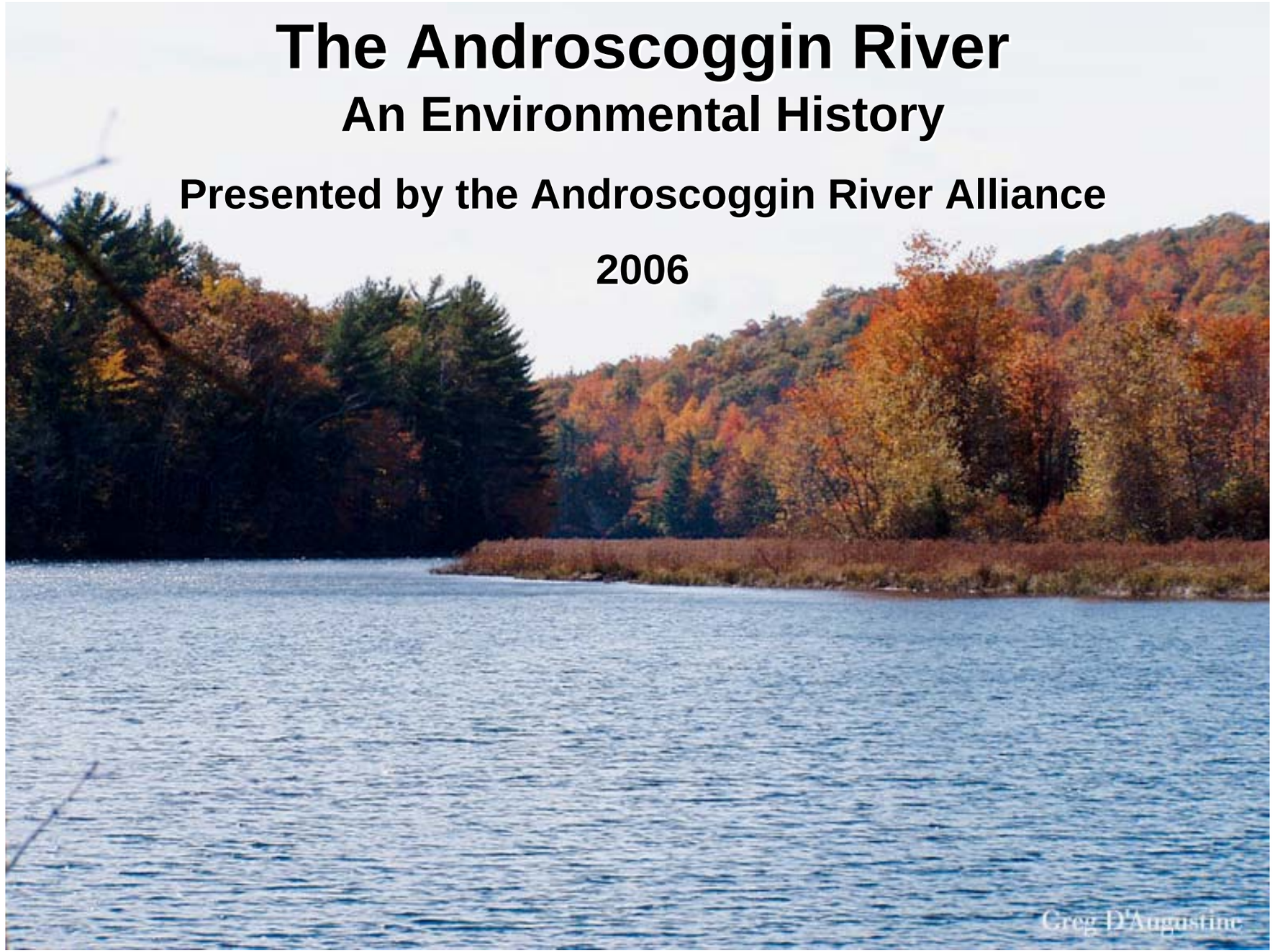
The Androscoggin River

An Environmental History

Presented by the Androscoggin River Alliance

2006

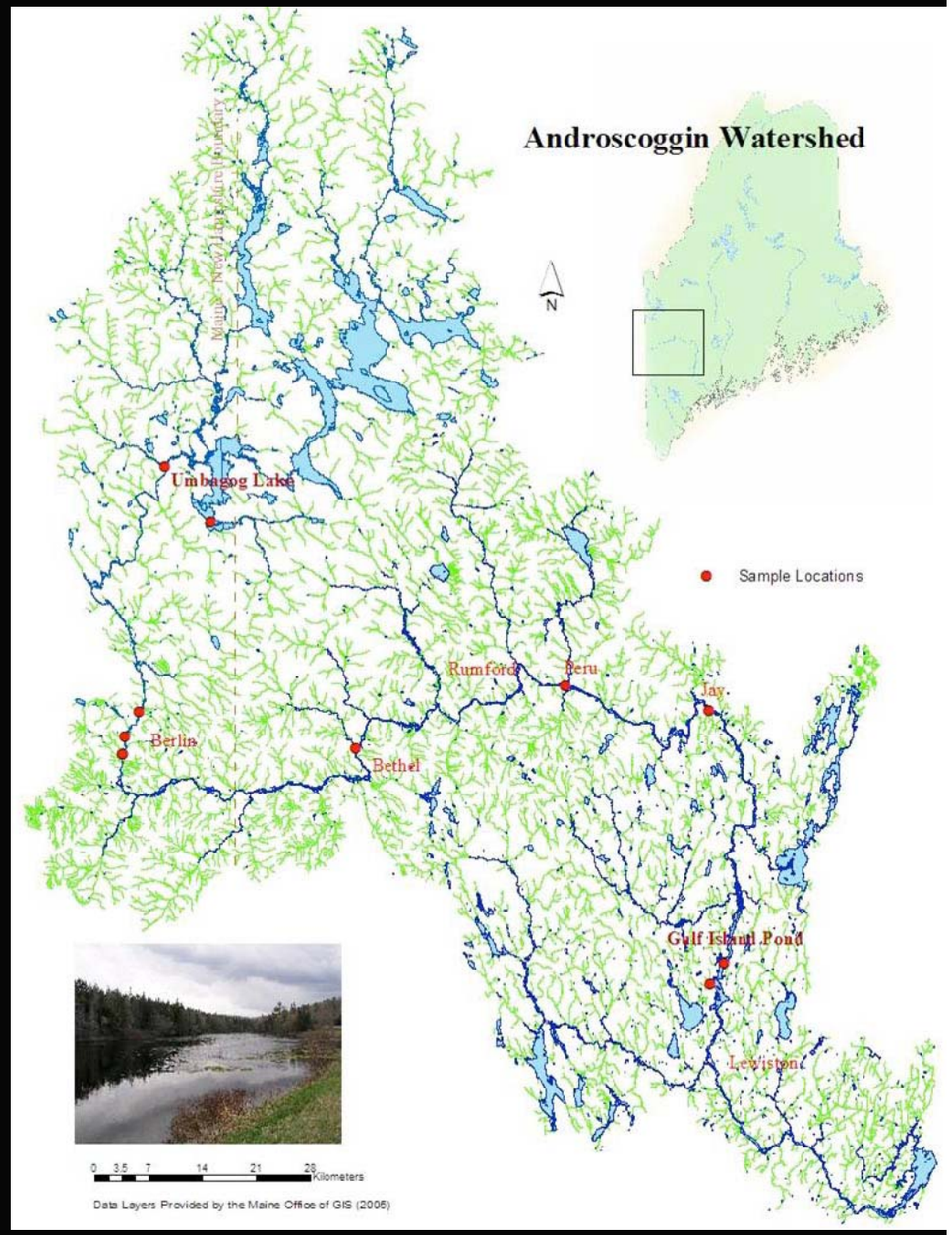


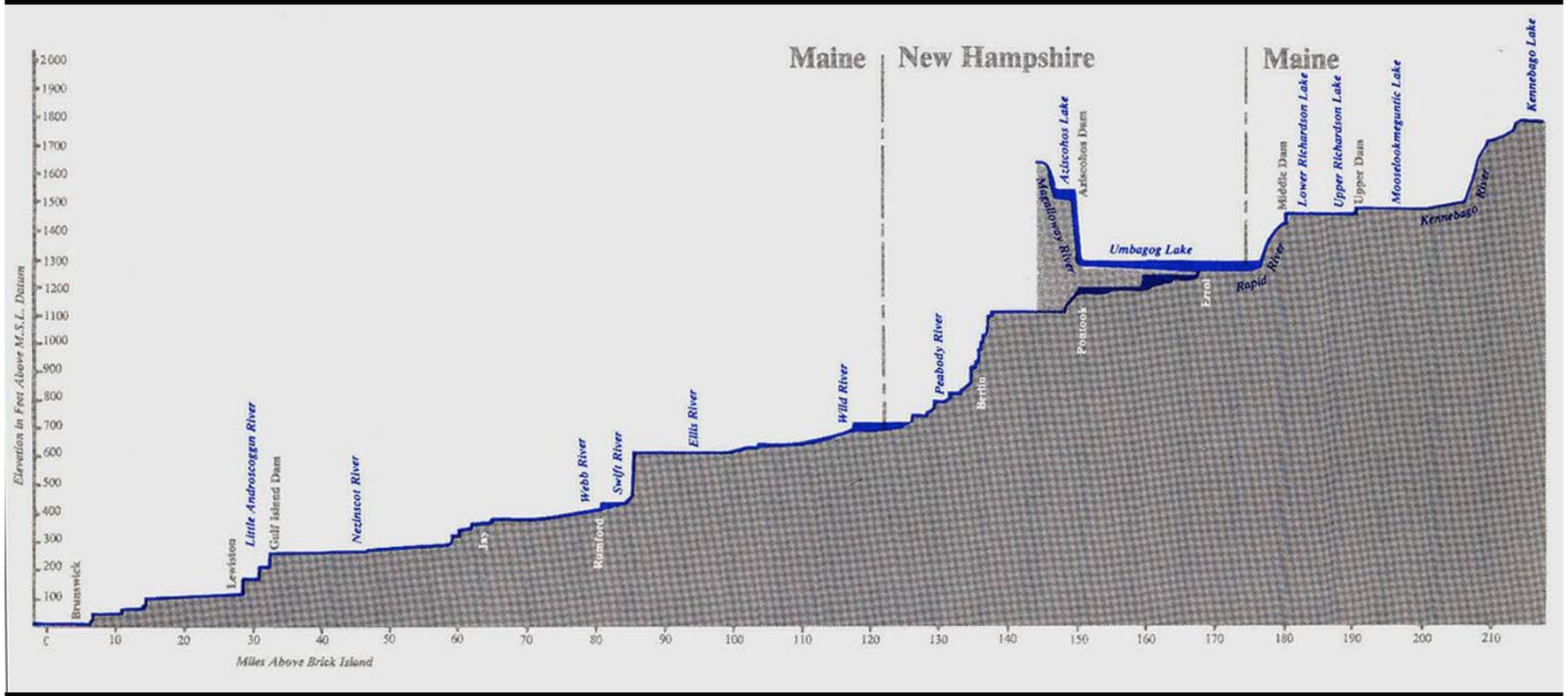
Outline

- Meet the River
- Pre-colonial History
- Colonial Period
- Logging
- Industrial Era
- Clean Water Act Era

The Androscoggin River

- Third largest river in Maine
- Draining a watershed of approximately 3,450 square miles, traveling 164 miles
- The river begins in the Rangeley Lakes region of Maine and descends 1,500 vertical feet to Merrymeeting Bay





For its length, the Androscoggin descends “more than any other river” in Maine.

Androsc Hayden Anderson, Canals and Inland Waterways of Maine

Pre-Colonial Riches of the River Basin

- Game was abundant in the Androscoggin Valley including bear, moose, deer, beaver, otter, mink, and foxes

- Each spring thousands of Atlantic Salmon came in from the ocean and fought their way up the river and its tributaries to spawn

- It was the year round home to brook trout, while shad and alewives swam partway up the river each year

Starbird, Charles. The Indians of the Androscoggin Valley 1928
Jones, Page Helm. Evolution of a Valley 1975

Native Word Association with the Natural Landscape

- Androscoggin means “plenty of fish” – Maine Times 1971 or “Fish coming in the Spring” – Charles Starbird 1928

- The Abenaki’s named the river in segments after their physical characteristics. This may also have served to define territorial boundaries

- The Pejebscots, a subtribe of the Abenaki, derived their name from a word meaning “long rocky rapid part,” had their seasonal camps between Merrymeeting Bay and the Lewiston-Auburn Falls

Brunswick, Maine: 250 Years a Town

First Human Inhabitants: The Abenaki

- The land was inhabited by Native Americans for perhaps 9,000 years before white people arrived in New England
- In northern New England they were classified by the similarity of their dialects as the Abenakis, “people of the dawn.”
- In Maine, subtribes of the Abenakis lived along the three largest rivers, including the “Anasagunticooks,” or “Androscoggins.”
- Fishing camps were located adjacent to falls where fish gathered in their attempt to swim upriver

Brunswick, Maine: 250 Years a Town
Photo courtesy: Ne-Do-Ba

Abenaki History

"They always made two trips each year to the sea-coast. These were made for the purposes of visiting the graves of their fathers; to hunt sea-fowl; to buy and sell furs…The last of these trips on record is in 1796"

Auburn, Maine

Lewiston Journal, 19-Dec-1928
Ne-Do-Ba 1997

Colonial Era

- The first recorded trip up the river from Popham to Lisbon Falls occurred on September 25th, 1607, and was led by Raleigh Gilbert
- Gilbert said “Here we found nearly fifty able men, very strong and tall, such as their like before we had not seen. All were painted and armed with bows and arrows”
- It is believed that a plague decimated the Abenaki in 1615

Starbird, Charles. The Indians of the Androscoggin Valley 1928

Jones, Page Helm. Evolution of a Valley1975

- Thomas Purchase established a trading post near present day Brunswick around 1628; he traded almost exclusively with the Native Americans

- In July 1683 the land from seacoast to the “uppermost falls in said Androscoggin River” was purchased by a Boston merchant named Wharton

- Until the 1700’s, development was largely restricted to small agricultural settlements in the Brunswick area.

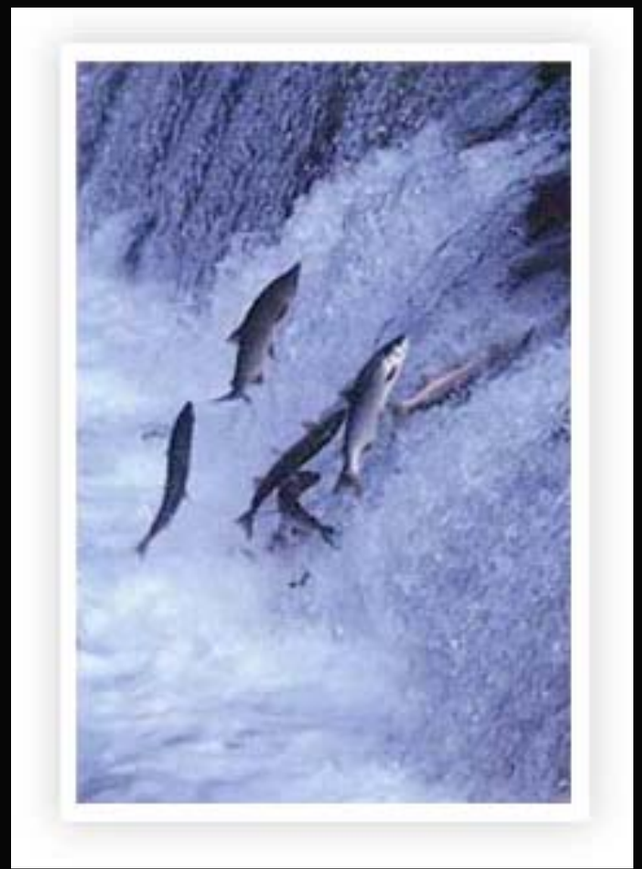
Starbird, Charles. The Indians of the Androscoggin Valley 1928

Colonial Uses of the River

Maine Times 1971

- 1673 – The English had a commercial fishing operation at Pejebscot Falls in Brunswick

- In three weeks they reportedly took 40 barrels of salmon and more than 90 kegs of sturgeon



American Rivers

Riverside Development

- The late 1700's and early 1800's was marked by small scale industrial development along the lower river (small grist and sawmills).
- Industrial growth and decline of textiles and leather continued until the 1950's.
- The first paper mills appeared on the river in the late 19th century.

Log Drives on the River

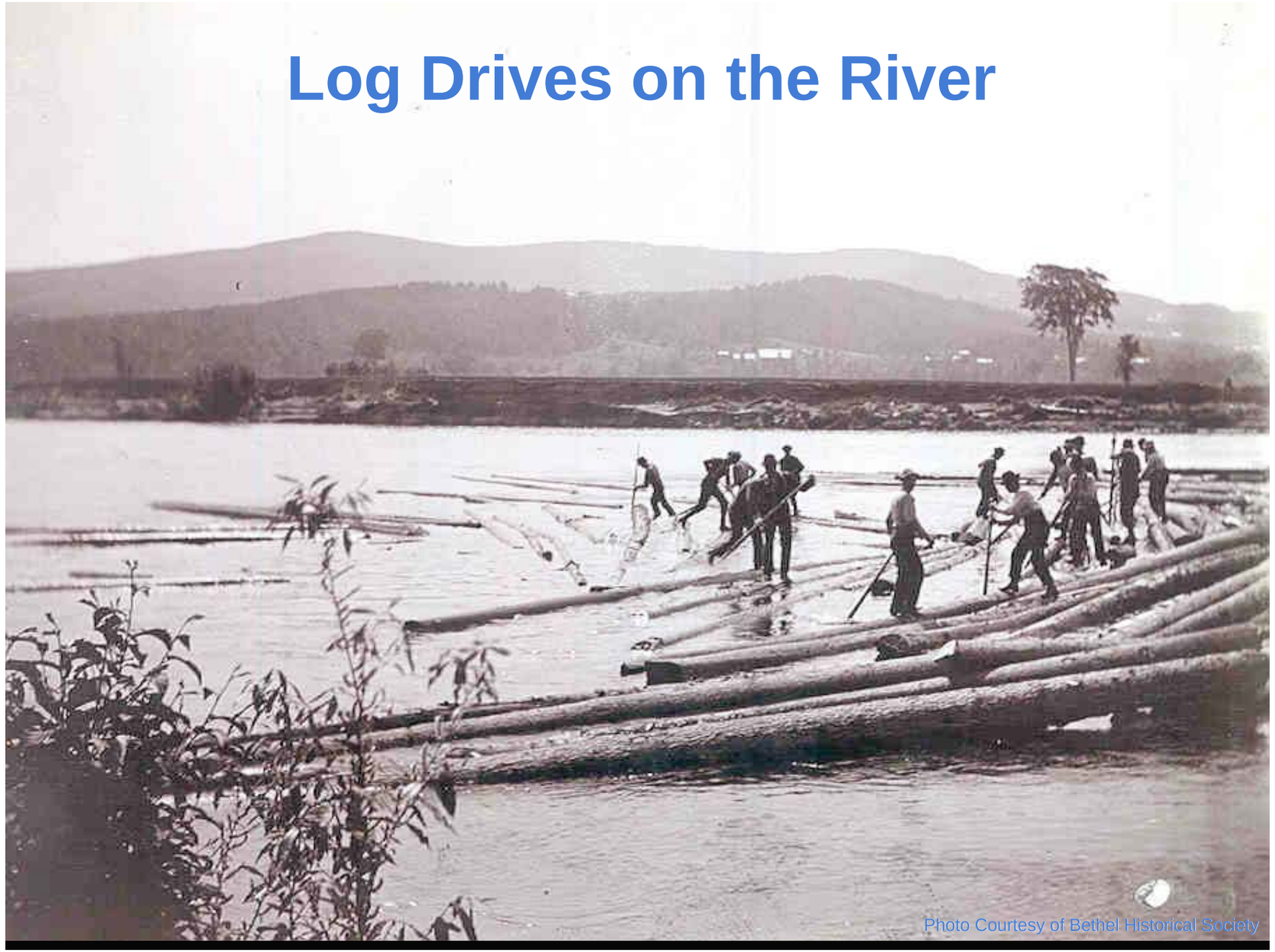
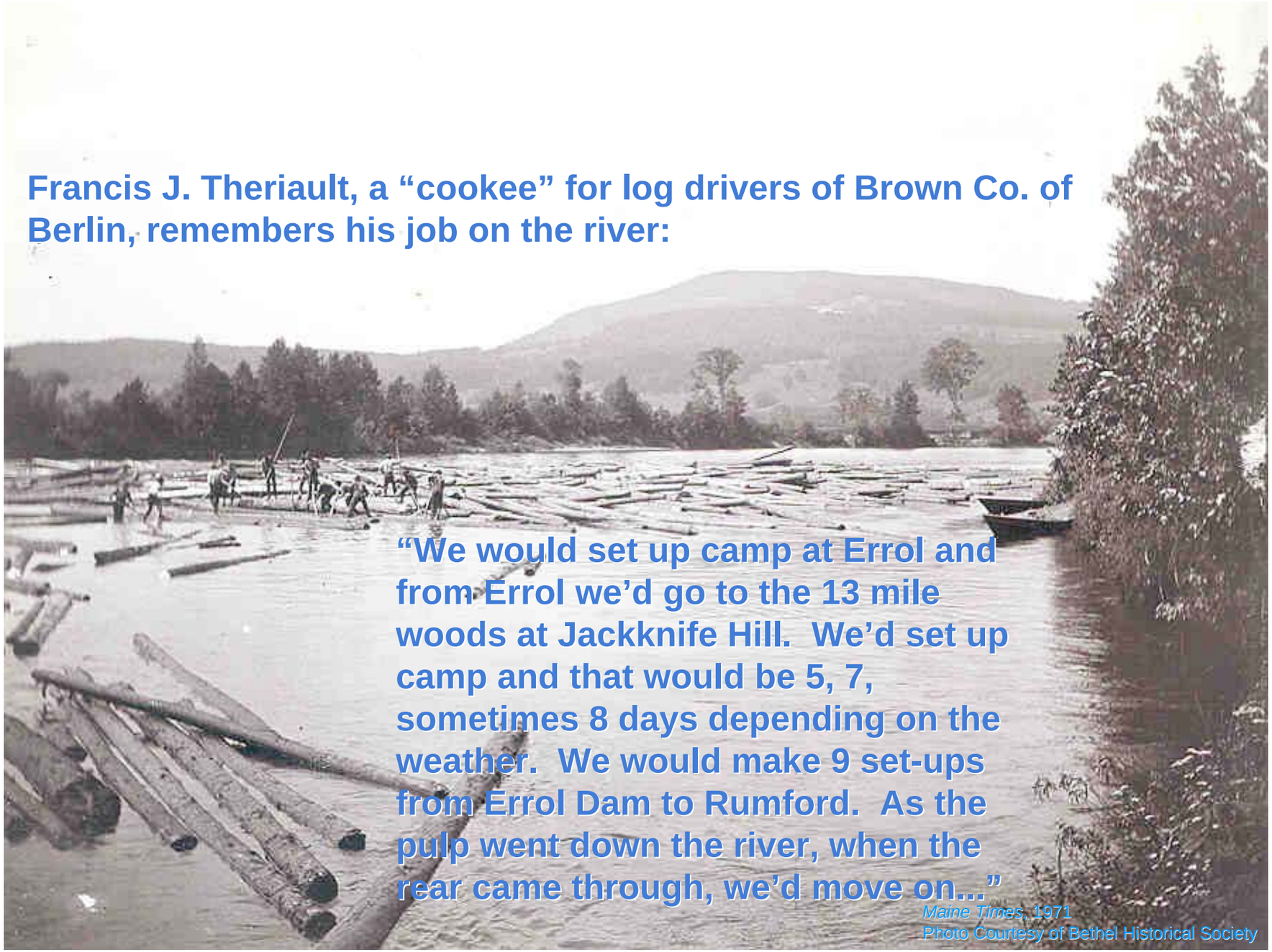


Photo Courtesy of Bethel Historical Society



Francis J. Theriault, a "cookee" for log drivers of Brown Co. of Berlin, remembers his job on the river:

"We would set up camp at Errol and from Errol we'd go to the 13 mile woods at Jackknife Hill. We'd set up camp and that would be 5, 7, sometimes 8 days depending on the weather. We would make 9 set-ups from Errol Dam to Rumford. As the pulp went down the river, when the rear came through, we'd move on..."

Maine Times, 1971

Photo Courtesy of Bethel Historical Society

Great Falls, 1912

Notice the facial profile in the rock. Formerly a trademark of the falls, it was blown up in 1928.

Changes in Logging

- In 1925 Brown Company developed a chemically-produced wood product called “Kemival” which made use of hardwood. Previously only soft wood was used in the Androscoggin paper industry.
- Drives began to decline in the 1930’s.
- However hardwood could not be floated, so gravel roads were built into the woods.
- Accessibility prompted a shift towards over-land transport of wood, and also let the loggers spend their weekends in town.
- Log drives ended statewide in 1976 when Public Law Chapter 355 was enacted.

D.B. Wight, The Androscoggin River Valley 1967

“The Lumber Business demands men of steady nerve, for it is a hazardous business”

(Lewiston Saturday Evening Journal, 1878)

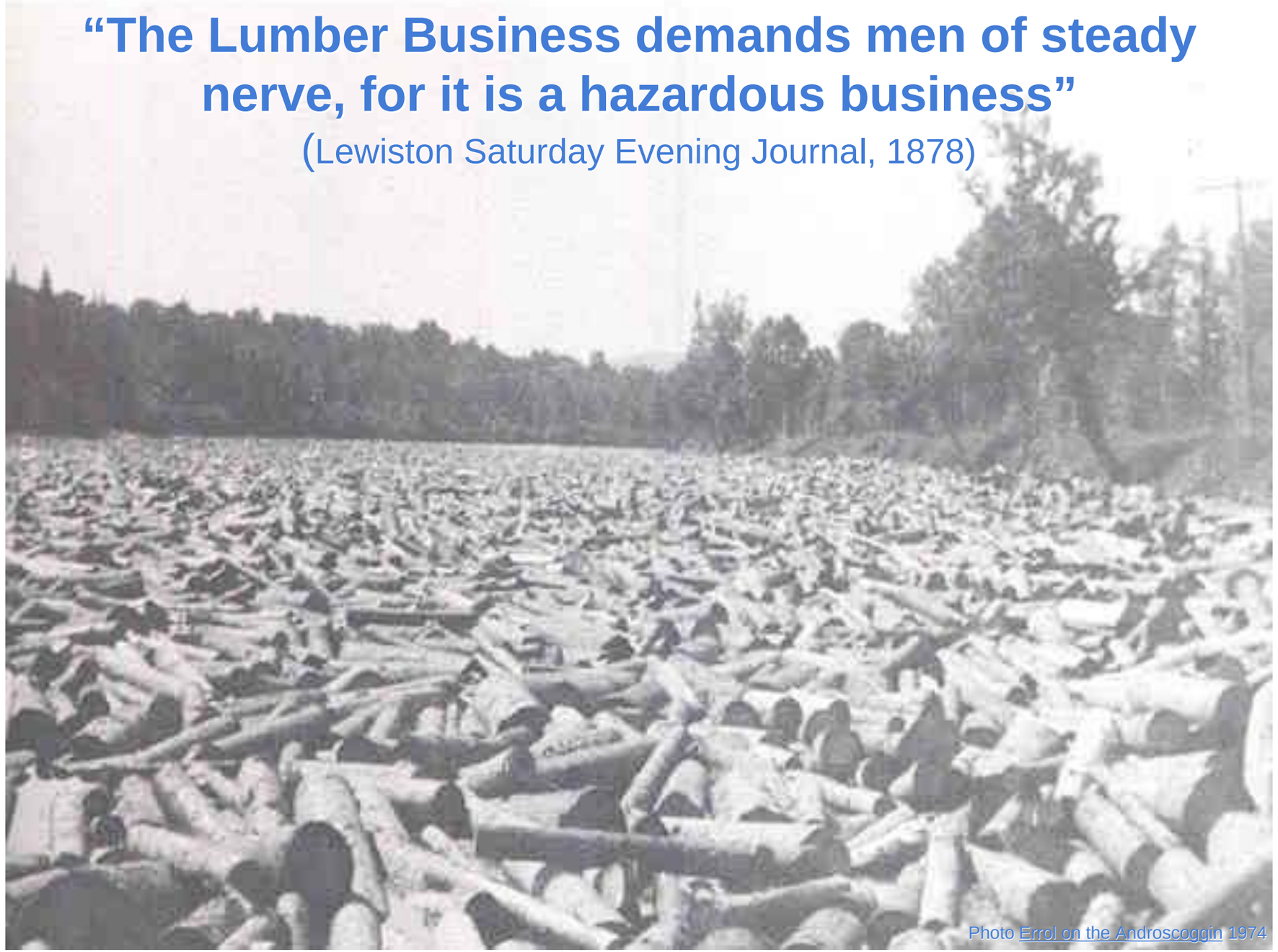


Photo Errol on the Androscoggin 1974

Ice was harvested for refrigeration in 1913 but it was too polluted for ice cubes.

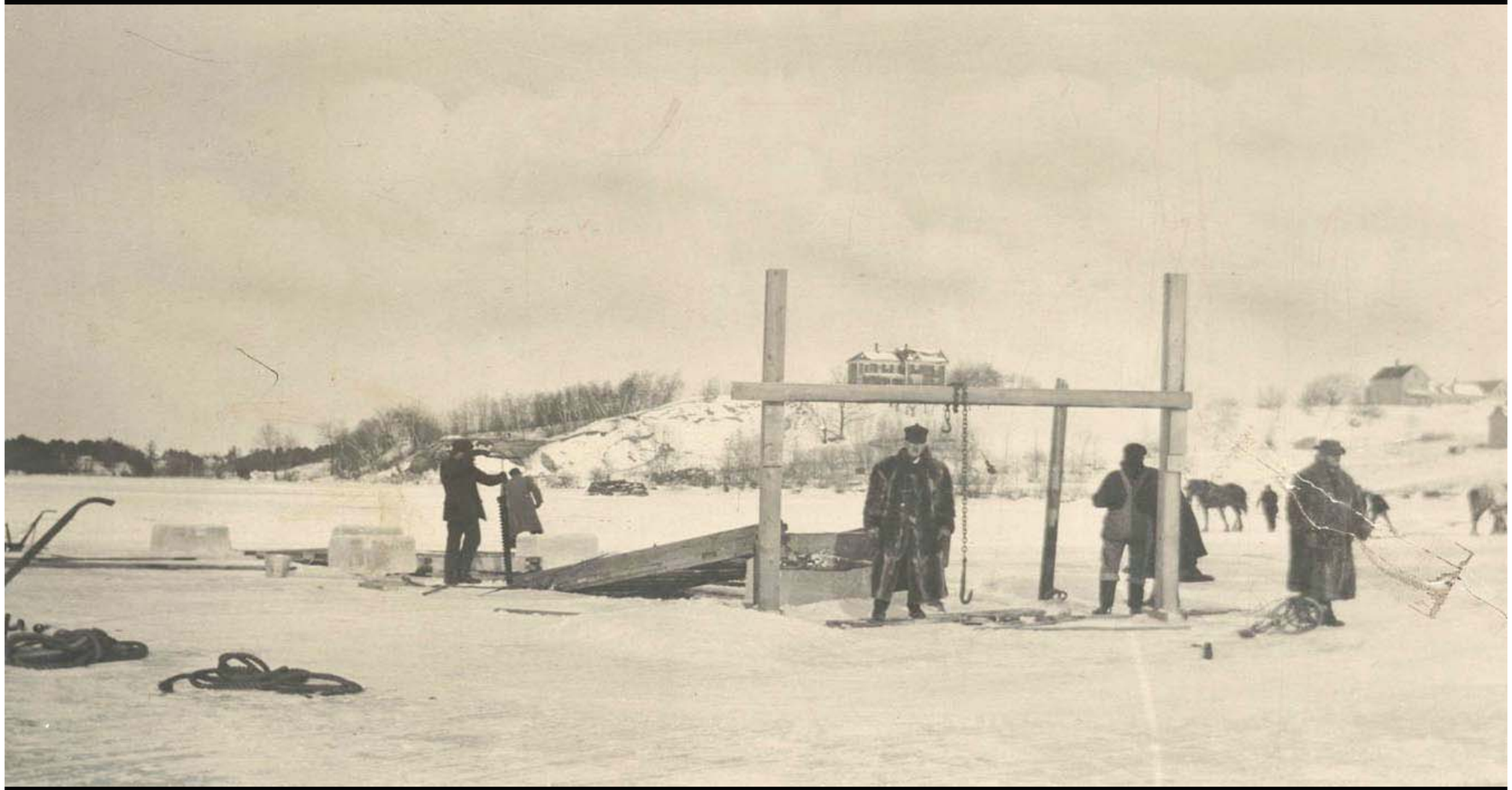
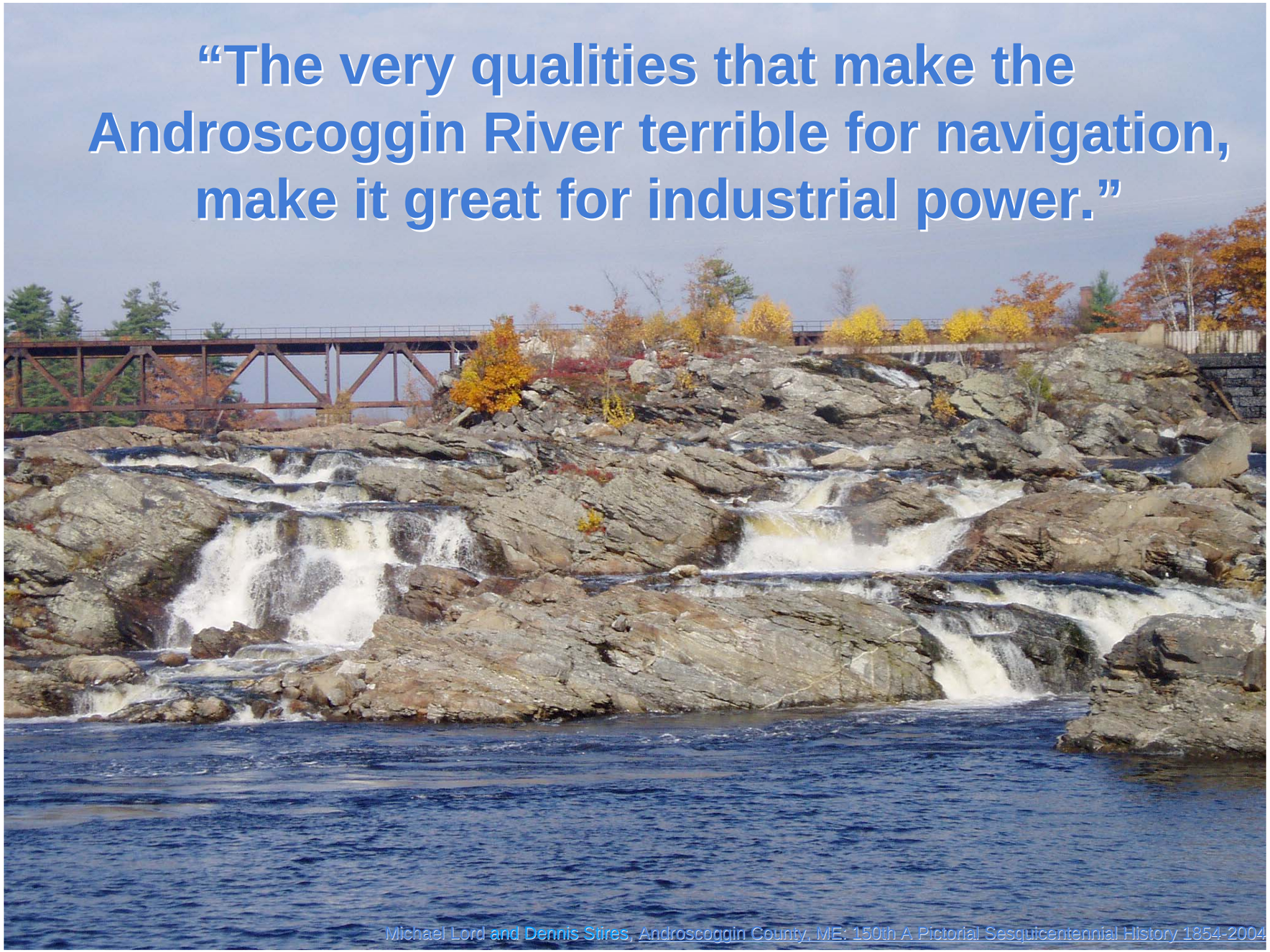


Photo Courtesy Androscoggin Historical Society


“The very qualities that make the Androscoggin River terrible for navigation, make it great for industrial power.”
Michael Lord and Dennis Stires, Androscoggin County, ME: 150th A Pictorial Sesquicentennial History 1854-2004

Great Falls 1899

Photo courtesy of Ne-do-ba

Water Powers the Growth of L/A

- During the 1840s the Lewiston textile mills boomed and Lewiston's population exploded.
- Irish immigrants were hired to build canals in Lewiston.

Bates Textile Mill – 19th Century

Paraphrased from Michael Lord and Dennis Stires Androscoggin County, ME: 150th A Pictorial Sesquicentennial History 1854-2004

Photo courtesy www.archives.gov

Construction of Bates Mill #5 – 1912

Photos courtesy of Androscoggin Historical Society

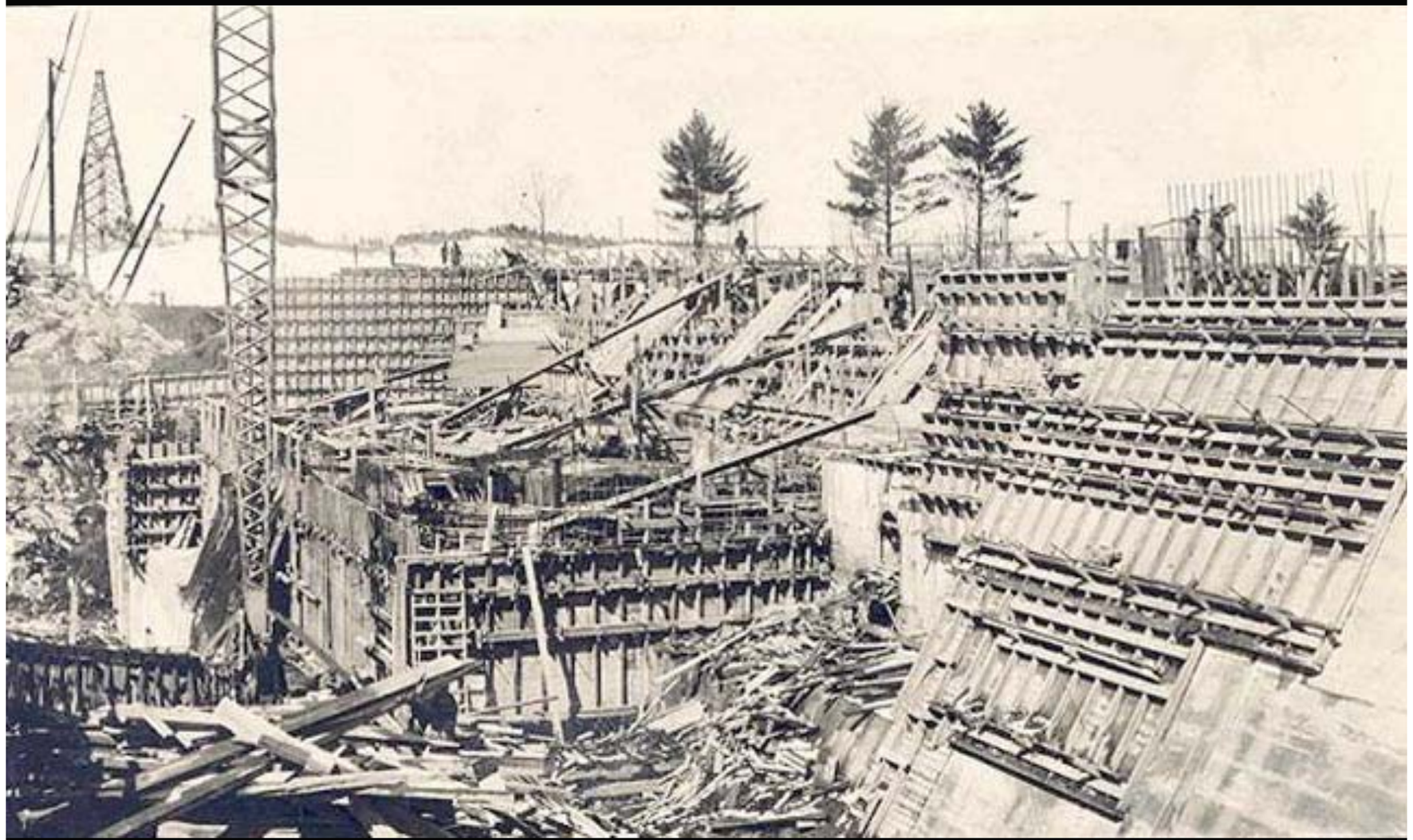
W.S. Libbey Textile Mill – 1925

Photos courtesy of Androscoggin Historical Society

Buying up the Androscoggin

- Throughout the 19th and into the 20th century, “water people” bought up the rights to the river bottom in order to build dams to facilitate logging, and later to generate electricity.

Michael Lord and Dennis Stires Androscoggin County, ME: 150th A Pictorial Sesquicentennial History 1854-2004



Gulf Island Dam - 1925

Photo courtesy of Androscoggin Historical Society

Near completion in 1925, Gulf Island Dam is now owned by Florida Power and Light

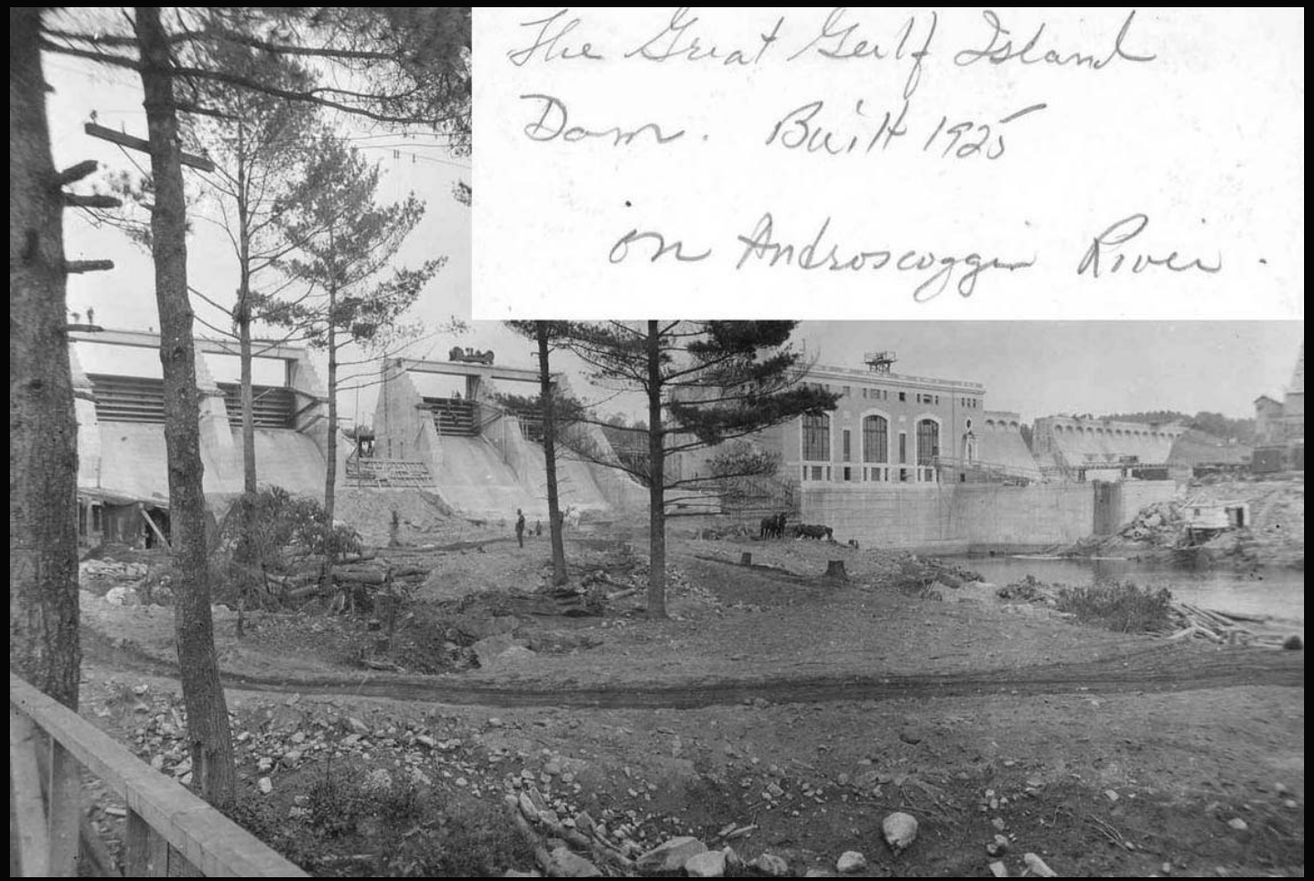
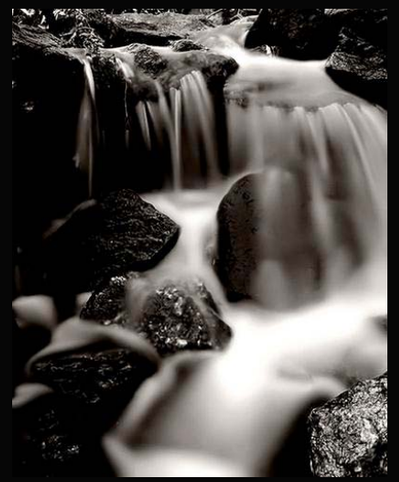


Photo courtesy of Androscoggin Historical Society



- Currently Gulf Island Pond is the most polluted section of the river, because the dam creates a catch-basin for pollutants and organic waste from the mills and communities upstream.

Crossing the River – circa 1910

West Bethel

Photo courtesy of Bethel Historical Society

Spring Flood of 1936 -- Lewiston

Androscoggin Historical Society

The River Gets Dirty

- In the 1880s paper mills along the river switched from a mechanical pulping process to the sulfite chemical pulping process

- The outcome was a soup of toxic chemicals

“The River was too thick to paddle, too thin to plow” – Local Saying

Foam builds below Great Falls (1930)

Photograph courtesy of Androscoggin Historical Society (2005).

The River Reeked:
"Jewelers couldn't keep their silver clean. It would turn brown." –Walter Lawrance

Photo courtesy of Androscoggin Historical Society

- The summer of 1941 was particularly dry. River sediments were exposed making it the worst year experienced for odor.

- Public pressure to fix the problem mounted.

- Metcalf and Eddy, a Boston firm were hired by the Sanitary Water Board to test the river and suggest remediation.

Lawrance, Walter “A Twenty-Year Review of Androscoggin River Pollution Control Activites” 1961

- During the study by Metcalf and Eddy the river was found to be almost completely devoid of dissolved oxygen from Berlin, NH to Lewiston, Maine.

- Dissolved Oxygen is essential for fish and aquatic life

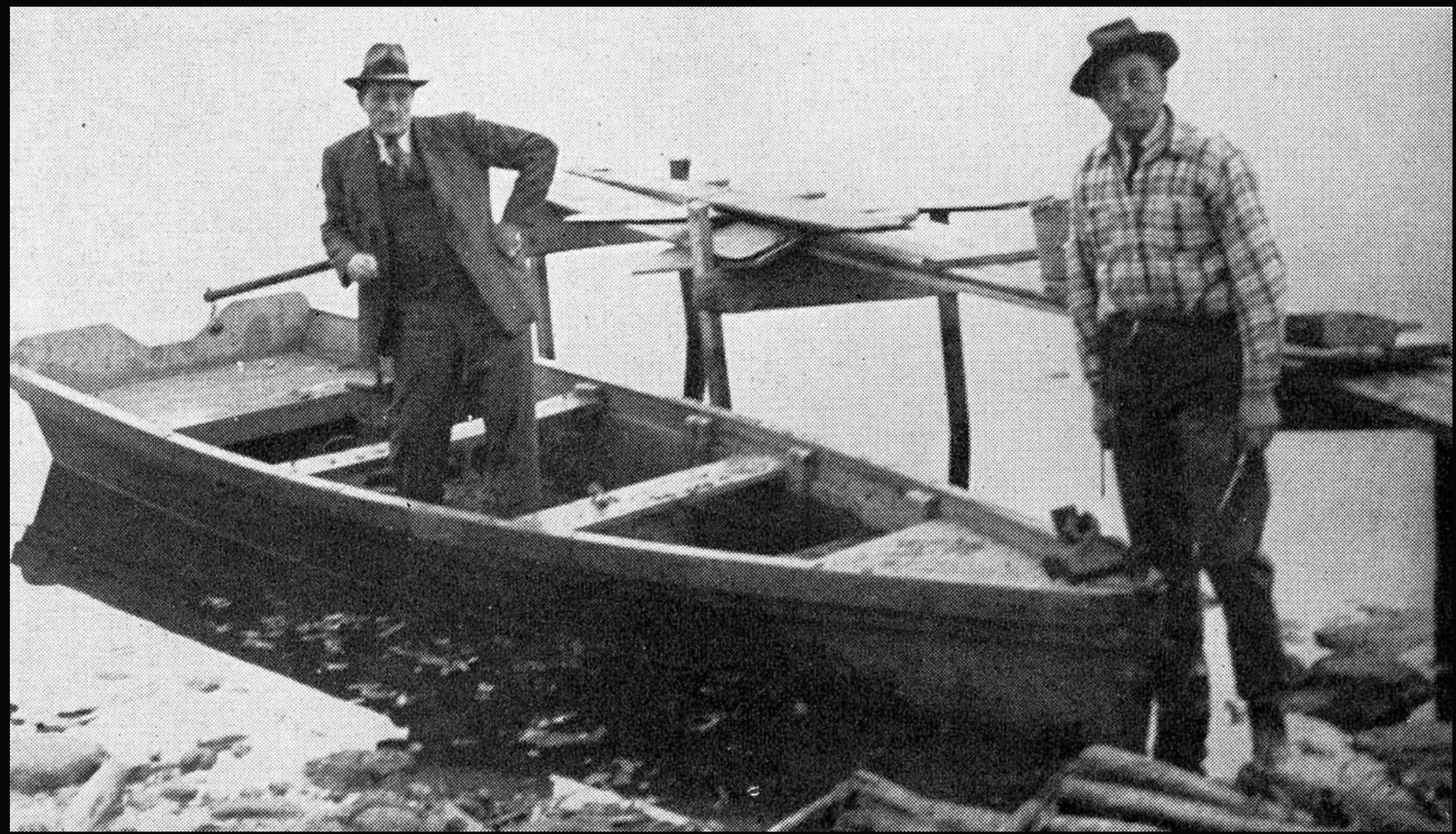
Report on Androscoggin River, 1962

Early attempts at improvement

- Several court orders demanded action by the mills to reduce the sulfite discharges.
- To reinforce these, Walter Lawrance was appointed as “River Master” in 1947.
- In 1948 the courts gave Lawrance authority to set weekly discharge limits.

The River Master 1947-1977

- Empowered by the courts, Lawrance alone set pollution standards for the Androscoggin's paper industry.



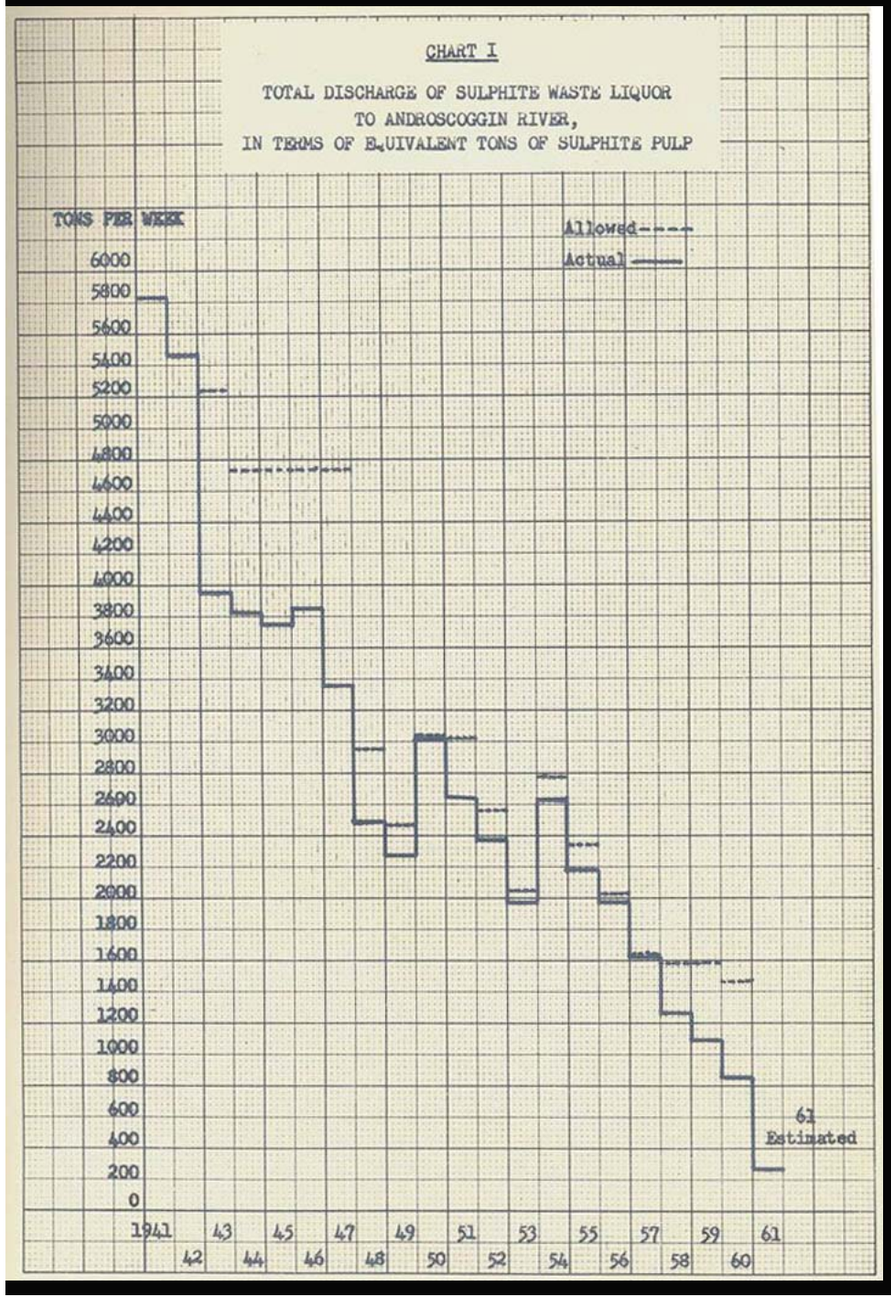
Walter Lawrance (left) and Doc Sawyer (Bates Professor of Biology) surveying water quality in 1947. Photo courtesy of Muskie Archives-Bates

Androscoggin Technical Committee

- Lawrance created the Androscoggin Technical Committee, a group which included 2 representatives from each mill. They met until 1977.

- Their primary purpose was to set discharge limitations.

Lewiston Daily Sun, March 6, 1978



Sulphite Waste Liquor Discharge 1942-1961

- In 1941, 5,280 tons (11,640,000 lbs) of waste liquor was discharged weekly.
- By 1961, there had been a 95% reduction, which was still a discharge of 275 tons (550,000 lbs) per week.

Lawrance, Walter A. “A Twenty-Year Review of Androscoggin River Pollution Control Activities” 1961

An attempt to Remediate The Lack of Oxygen

- Lawrance added sodium nitrate to the worst sections of the river because it contains 50% by weight of oxygen.
- Between 1948 and 1960, 6,694 tons of nitrate were added by Lawrance to the river.
- Nitrate was useful for raising DO levels, and eliminating odor-causing bacteria that cannot function in the presence of nitrate.

Switch from Sulphite Process to the Kraft Process

- Lawrance's regulation decreased production and the Kraft process was the solution.
- Kraft process chemical discharge was relatively less toxic.
- Kraft Process was more cost effective and became necessary for the mills to remain competitive.
- IP switched to Kraft in 1967, and others followed shortly.

“You give a dog a bad name and it stays.” –Walter Lawrance

- Lawrance felt that pollution was relatively small after 1966.
- In 1978 he estimated that people would be swimming in the river in 4 or 5 years.

Lawrance's Major Contributions

- Elimination of the worst odor problem.
- Elimination of the sulfite pulping process.
- Appreciable reduction in discharge of suspended solids and process water.

Michael C. Lord, Androscoggin County, ME: 150th A Pictorial Sesquicentennial History 1854-2004

“Some of these [future problems] will center around proposals for eventual classification of the various sections of the river.”

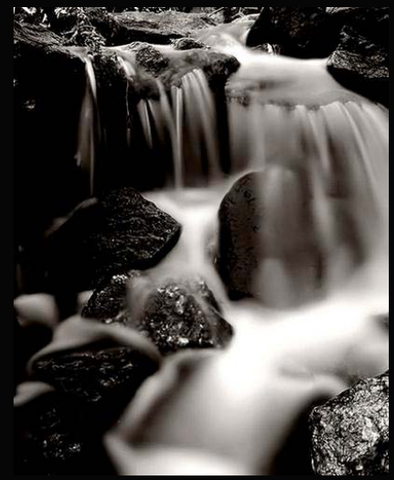
- Walter Lawrance, 1961

“Controlling water pollution will be expensive, but the cost of the program ought to be compared with the cost of non-action.” -Edmund Muskie

Edmund Muskie of
Rumford, Maine

“Failure to act would cost the Nation dearly in health impairment, the loss of recreational resources, and a decline in the quality of life.”

- Edmund Muskie



On October 18, 1972, over the veto of President Richard Nixon, Congress passed the Clean Water Act.

Clean Water Act

- Had the goal of eliminating discharge of pollutants to US waters by 1987 and ensuring that all waters would be “fishable and swimable”.
- Gave EPA the authority to implement pollution control programs such as:
  - Setting discharge limits for industry.
  - Establish a “revolving loan fund” to support construction of sewage treatment plants.
  - Protecting wetlands.
- Created goals for water quality in rivers (class AA, A, B, and C in Maine).
- Class C – That water quality be sufficient to provide for the protection and propagation of fish, shellfish, and wildlife and provide for recreation in and on the water.
- Portions of the Androscoggin do not meet class C standards.

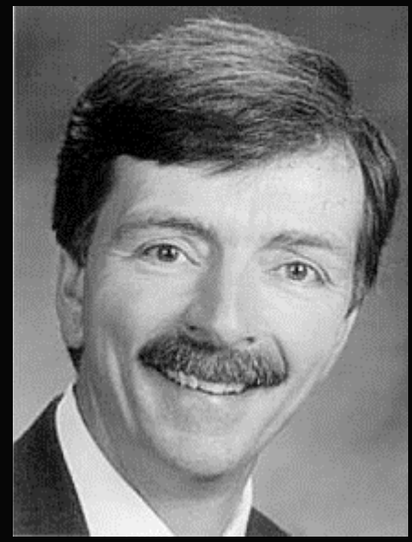
Following the Clean Water Act International Paper announced its policy concerning the environment in the following words:

- "International Paper Company believes that the aspirations of our society for a better life can be met, that the pollution of our environment can be controlled, and that the vital quality of the basic resources we all share can be maintained within the framework of our economy. IP Company is dedicated to do its part as an industrial citizen to achieve these goals."

-T.E. Linger, MGR. Air and Water Improvement, 1973

“Color Odor Foam”

- in 1989, The Maine Department of Environmental Protection conducted a study of pollution in the river.
- Representative John Nutting, D-Leeds, sponsored legislation to implement the study’s recommendations.



- The legislation passed, but was vetoed by Governor McKernan.
- A scaled-down version was passed in 1991.

Water Quality Testing, Berlin NH

Dioxins

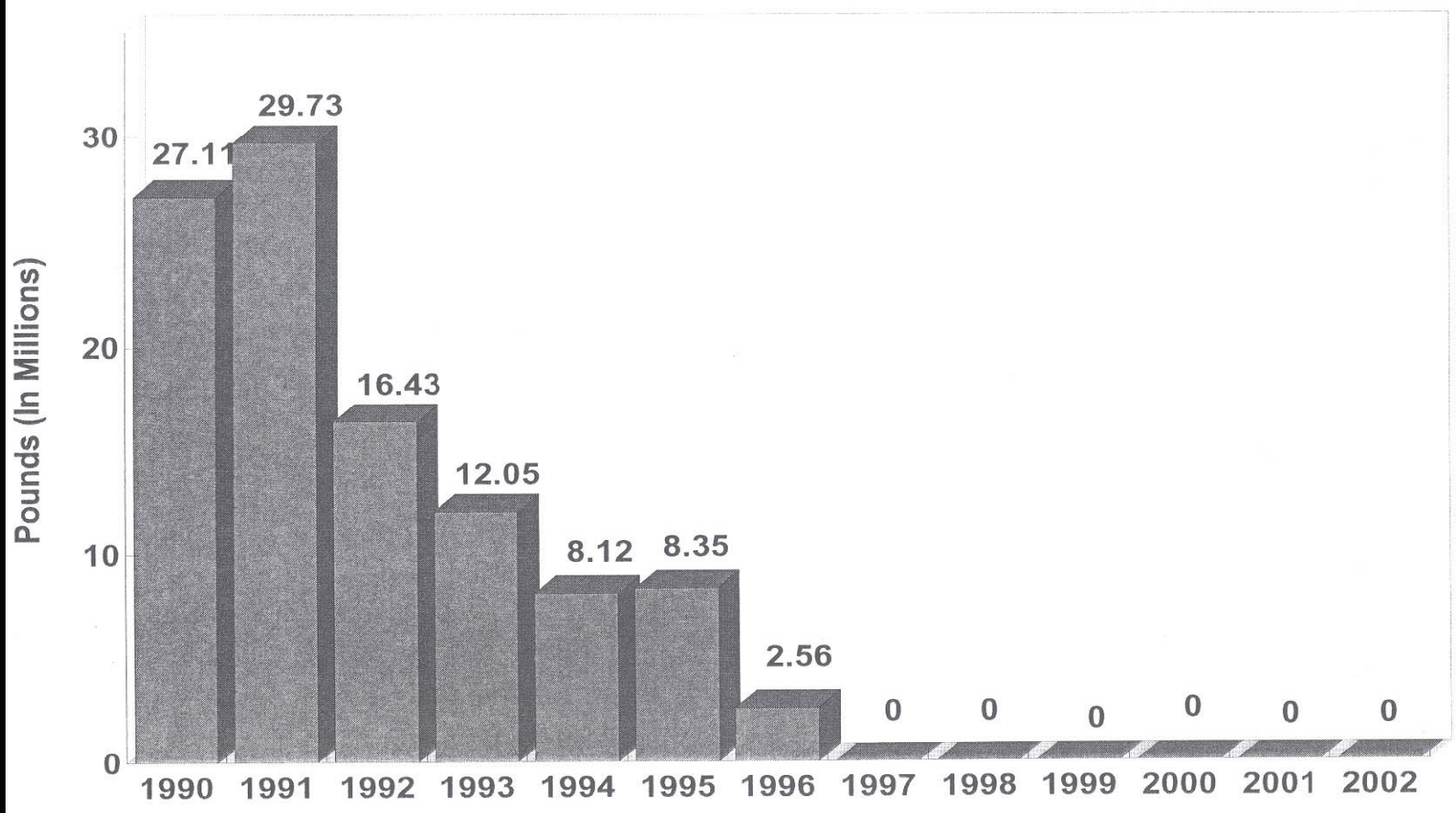
- Dioxins are man-made chemical by-products formed in manufacturing processes and during incineration.
- Studies show that dioxins are among the most potent animal carcinogens ever tested.
- In 1997, the “Dioxin Color Law” was passed requiring that “a bleach kraft pulp mill may not discharge dioxin into its receiving waters after December 31, 2002.”

- Chlorine used by the mills for bleaching pulp was the major source of dioxin in the river.
- Chlorine- free and elemental chlorine-free technologies are now used in the mills, sharply reducing or eliminating dioxin production.

Photo courtesy of Maine Rivers

CHLORINE USE

1990 - 2001



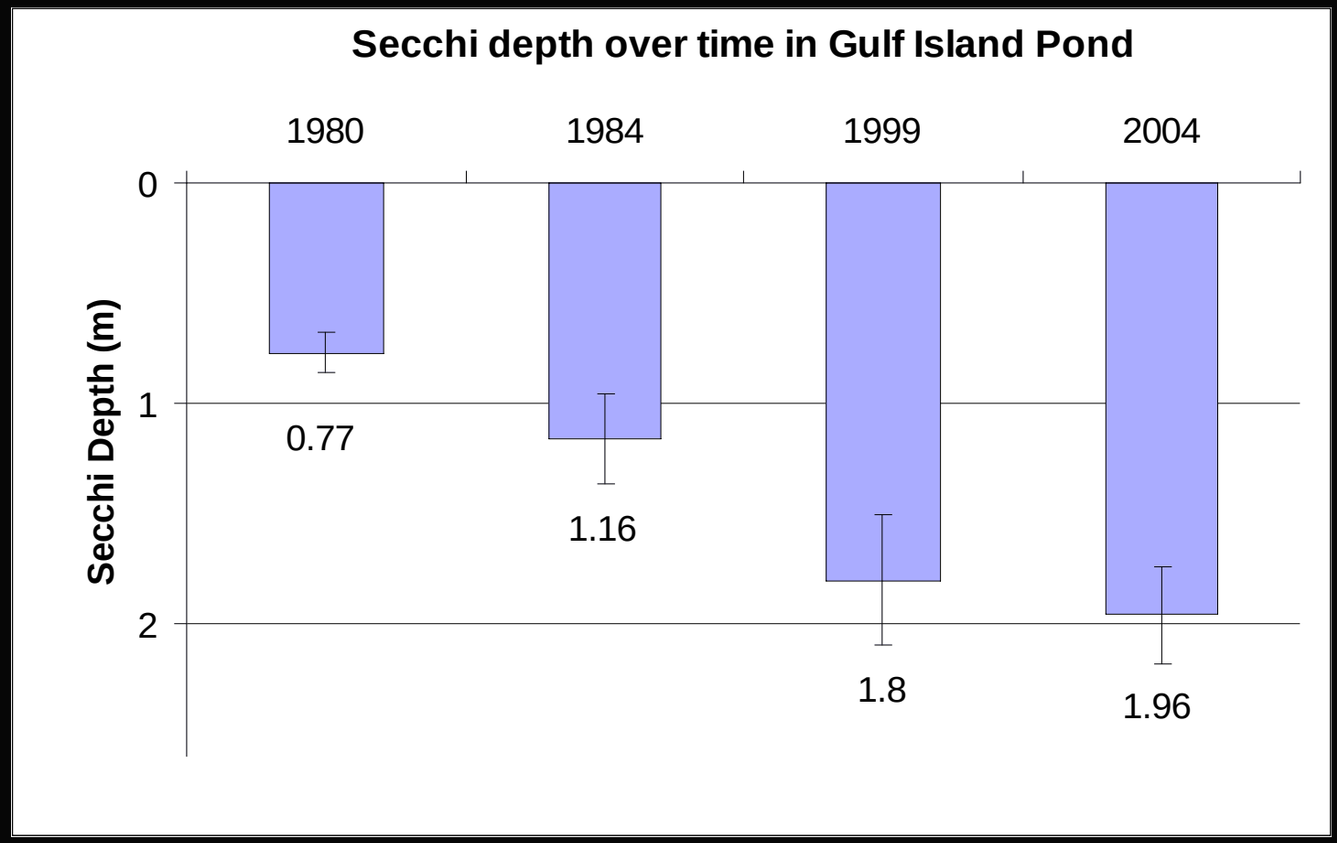
International Paper, Androscoggin

Courtesy of International Paper

- The DEP has recently determined that furan and dioxin levels in Androscoggin River bass and trout were significantly higher than found in the Penobscot or Kennebec.
- The DEP says that the Berlin, NH mill continued to be a source of dioxin.
- The Berlin mill closed in May 2006.

Fraser Paper, Berlin, NH

Secchi Depth of Gulf Island Pond



- Secchi depths less than 2m are common for eutrophic lakes or lakes with excess biological productivity.

MDEP 1980-2004

From Umbagog to the Sea

- While the river's headwaters are clean, the Androscoggin is still the most polluted river in Maine.

Lake Umbagog

- Along its course to the sea, the river is repeatedly dammed. It receives discharges from industrial and municipal sources as well as polluted runoff from a variety of sources.
- The river becomes more and more polluted as it approaches Merrymeeting Bay.

Photo courtesy Umbagog Chamber of Commerce

Current Environmental Issues…

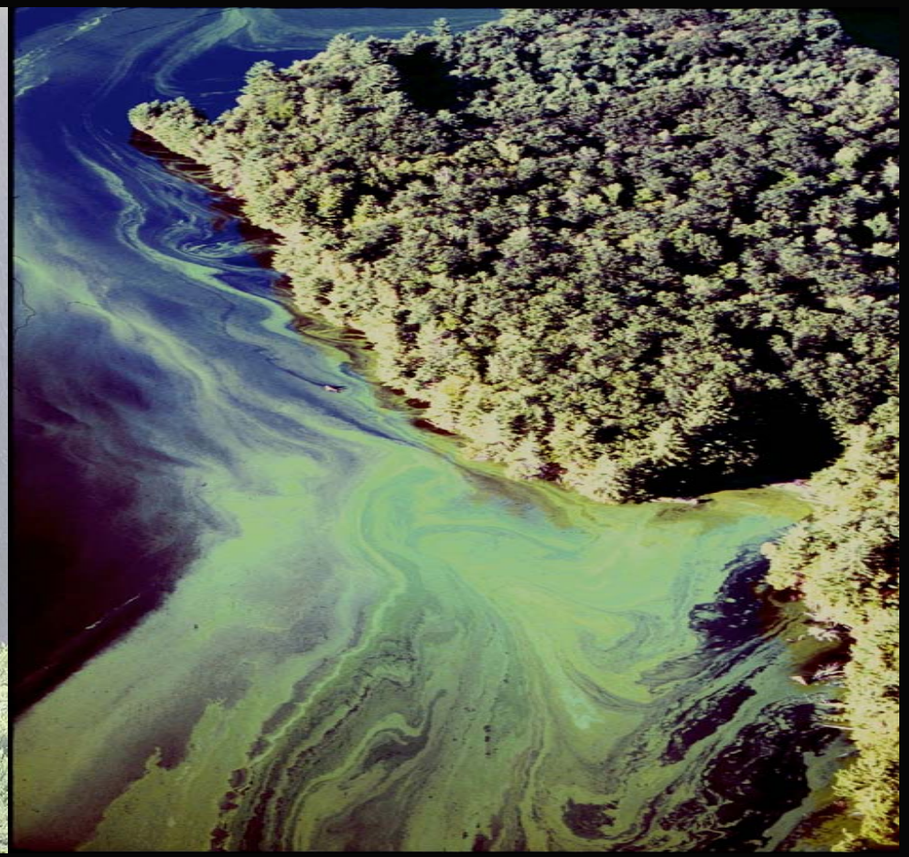
- Phosphorus and organic material, largely discharged by the mills, can produce late summer algal blooms that lower dissolved oxygen and limit the recreational potential of the river.

Plume from Effluent Pipe, 2005

Photo courtesy Department of Environmental Protection

Algae Bloom on Gulf Island Pond

2004



1995

Photo courtesy Natural Resources Council of Maine

The “Bubbler” on Gulf Island Pond

- In 1992 the dischargers built a “bubbler” in Gulf Island Pond.
- It has improved oxygen levels to some degree, but not in the deepest sections of Gulf Island Pond.

Nick Bennet, “A river under siege: fighting to clean up the Androscoggin”
Photo courtesy Natural Resources Council of Maine

Environmental issues…

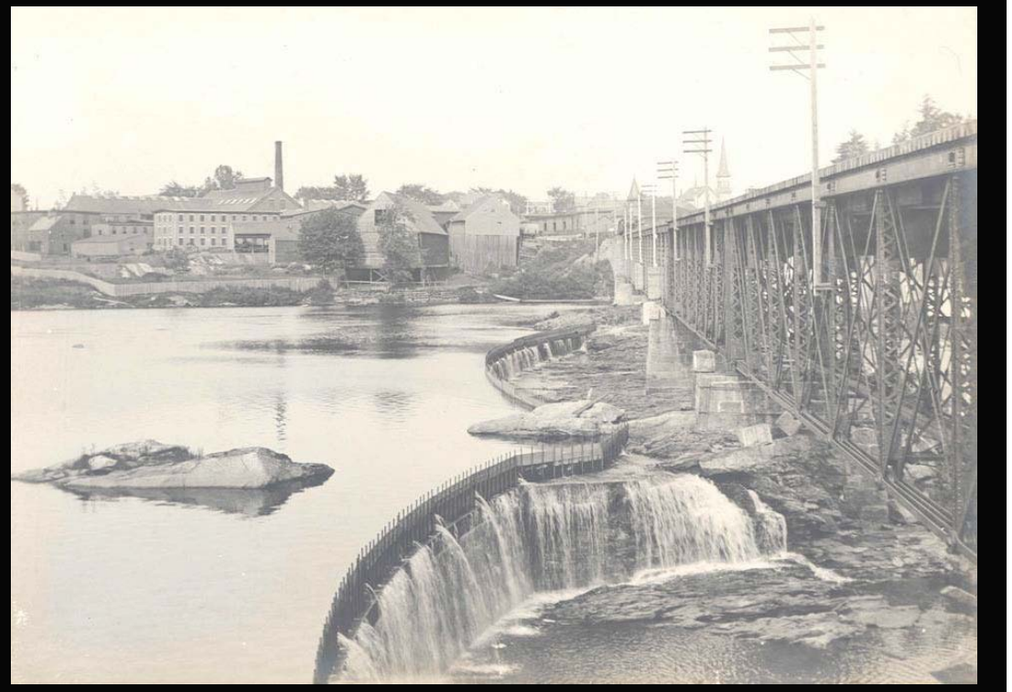
- Fish and mussels in the river still contain dioxins and mercury at levels unsafe for consumption.
- Municipalities experience sewage overflows during storms but are working to correct the problem.
- Dams in the river block passage of migratory fish like salmon, alewives and shad.

…more environmental issues

- The river sediment is infused with toxins.
- Pollution keeps part of the river from being “swimmable and fishable”, which inhibits recreation, tourism, and local commerce.
- The Brunswick Dam fish ladder is not effective for migrating shad.

Many Dams Continue to Degrade the River

- Eliminate natural aeration from waterfalls.
- Slow the speed of flow.
- Raise the water temperature.
- Block fish passage.



1865 – Great Falls Dam

Photo courtesy of Androscoggin Historical Society

Worumbo Dam

• In 2004, the Worumbo Dam in Lisbon Falls was the first dam in Maine to become certified by the Low Impact Hydropower Institute.

www.americanrivers.org

Fish Passage at Brunswick Dam

Photo courtesy E/PRO Engineering and Environmental Consulting L.L.C 2000

- Most shad are unable to climb the ladder, losing scales and getting killed in the process.
- From 1985 to 2004, only 247 shad successfully climbed the ladder.

Issues beyond our local river…

- A study in 1997 suggested that dioxin found in East Bay of Casco Bay had traveled down the coast from the Androscoggin.

- In a 1994 advisory, the Maine Bureau of Health suggested limiting consumption of lobster tomalley because of toxins like dioxin.

Wade et al. 1997

Casco Bay in relation to Androscoggin River and Merrymeeting Bay

Major Thanks to

John Reuter

Bates College Class 2007