Historical Maps, Geospatial Methods, and Brooklyn’s Early Chemicals and Petroleum Industries

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Old maps
New maps
The point of this talk:

1 History
In the 19th and 20th centuries ...

2 Economic geography
Newtown Creek, a narrow channel between Brooklyn and Queens ...

3 Geospatial referencing
Examined with GIS methods, historical maps ...

4 Environmental legacy
1859: illuminating oils

By the fall of 1859, there were in this country at least 33 "coal-oil" refineries actively engaged in the manufacture of hydrocarbon illuminating oils that differed very little in chemical composition from the petroleum-based illuminants that would shortly displace them. By far the largest of these coal-oil works was the pioneer plant of the New York Kerosene Oil Works, located on the east bank of Newtown Creek in what is now the Borough of Queens.

Abraham Gesner’s process for refining kerosene from coal:

After the liquid was obtained by dry distillation in a closed retort, it needed to be chemically treated to removed undesirable impurities. Gesner used sulfuric acid, 5 to 10 percent the volume of the oil being treated.

US Patent 11203 (1854)
Charles Pratt

- Pratt came to New York in 1851 to work for Schenck & Downing, dealers in paints, oils including whale oil, and glass.
- In 1858, Pratt is named a partner of the firm that had become Raynolds and Devoe.
- "Pratt was especially interested in the emerging petroleum industry and in the 1860s he helped oversee the creation of the Devoe and Pratt Manufacturing Company—later the Devoe Manufacturing Company. This subsidiary operated an oil refinery on the Newtown Creek in Queens. Its special "Patent Cans" were particularly well suited to exporting..."
Gasoline still, fractionating tower, and condenser at the Pratt Astral Oil Works.
(Scientific American, Supplement, May 18, 1872)
Pratt’s Astral Oil
William Nichols and Newtown Creek

William Nichols, born in Brooklyn in 1852; attended Brooklyn Polytechnic Institute and New York University, earning a BS degree in Chemistry in 1870.

1870 Nichols joined Laurel Hill Chemical Company as a chemist. In 1871, with Baumgarten retired, the company became Walter and Nichols Co. The company acquired more land and built capacity for production of sulfuric acid, HNO₃, and HCl. Reorganized as G. H. Nichols and Company.

1876 J. B. F. Herreshoff joined the company, began a career of developing new technologies that affected all areas of the company’s operations.

1880s As other producers did, the G. H. Nichols Co. began to use pyrites as the source for sulfur (formed in the thermal decomposition of FeS₂).

1890 G. H. Nichols develops an interest in refining copper from the company’s pyrite waste stream.

1890 Herreshoff developed a form of the contact catalytic process (SO₂ product of chamber process oxidized to SO₃ in flow though red-hot Pt tube), with strong effects on the company’s fortunes.

1891 G. H. Nichols and Co. splits, conveying land to the Nichols Chemical Company; G. H. Nichols and Co continues to refine copper.

1892 Nichols constructs one of the first large-scale systems for electrolytic refining of copper: Nichols Lake Substitute (NLS) competes with Lake Superior copper, the US Bureau of Mines standard.

1895 Nichols produces high purity blister copper, cast as bars, ingots, wire, etc. G. H. Nichols and Phelps Dodge (supplier of pyrite) form partnership.

1899 Nichols leveraged the company’s catalytic contact process to organize the General Chemical Company, merging 12 companies and 19 plants.

By the time Germany invaded Belgium, August 1914, the US sulfuric acid industry produced 4,047,982 short tons annually. The combined total of Britain, Germany, and France was about half as great.

Sulfuric acid production and oil refineries
Nichols Chemical and Nichols Copper Companies, late 19th century
John D. Rockefeller; the growth of the Standard Oil Company at Newtown Creek
NYC DOITT aerial photograph 1924
NYC DOITT aerial photograph 2010
Queens V. 3, Plate No. 41 Map bounded by Laurel Hill Blvd., Washington Ave., Newtown Creek, 1902
Queens, Vol. 2, Double Page Plate No. 30; Part of Ward Two Laurel Hill; Map by Berlin Ave., Newtown Creek, Laurel Hill Boulevard; Including Newtown Ave., Brook School Road, Newtown Turnpike
from First and second words: Long Island City and Newtown. (In 3 layers) Depicts: 1912 Last modified on: 3 control points.
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Viewing warped map
1978 A Coast Guard helicopter flying over Newtown Creek notices a 400 gallon oil slick. Sump pumps installed along Newtown Creek recover 95000 gallons of oil in 6 month period. The Coast Guard describes slick as part of 17 million gallon oil spill.

1990 Mobil enters a consent agreement with NYS Department of Environmental Conservation. TRC Environmental Corporation finishes an assessment for Eldorado Coffee Company (in neighborhood of Newtown Creek) finding elevated levels of benzene, toluene, and other chemicals in air and soil samples.

1998 BP and Amoco merge to form BP Amoco; Exxon and Mobil merge to form ExxonMobil.

2004 Riverkeeper (advocacy group) file suit against ExxonMobil citing the Clean Water Act and the Resources Conservation and Recovery Act. Chevron enters into consent agreement with NYS DEC.

2005 Riverkeeper files a complaint against ExxonMobil, BP, and Chevron.

2006 US House of Representatives authorizes EPA to conduct a public health and safety study of the spill. Exxon restarts its oil recovery pumps as per 1990 consent agreement.

2007 NYS AG Andrew Cuomo files suit against ExxonMobil. EPA releases its study of the spill: estimates spill to be as large as 30 million gallons; surrounding air contains high levels of methane; recommends further study.

2010 September, the US EPA adds Newtown Creek to Superfund National Priorities List;

   November, ExxonMobil agrees to pay $25 million and commit to a more thorough cleanup of its huge oil spills along Newtown Creek and a faster timetable for the process, according to a settlement announced on Wednesday by Attorney General Andrew Cuomo.

2012-present Under authority of the EPA, the collection and analysis of samples from Newtown Creek-bed in progress.
Thank you.

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