

Hydroelectric Projects in the Black River Basin

The process and opportunities for
relicensing the third-most heavily
developed watershed in the U.S.

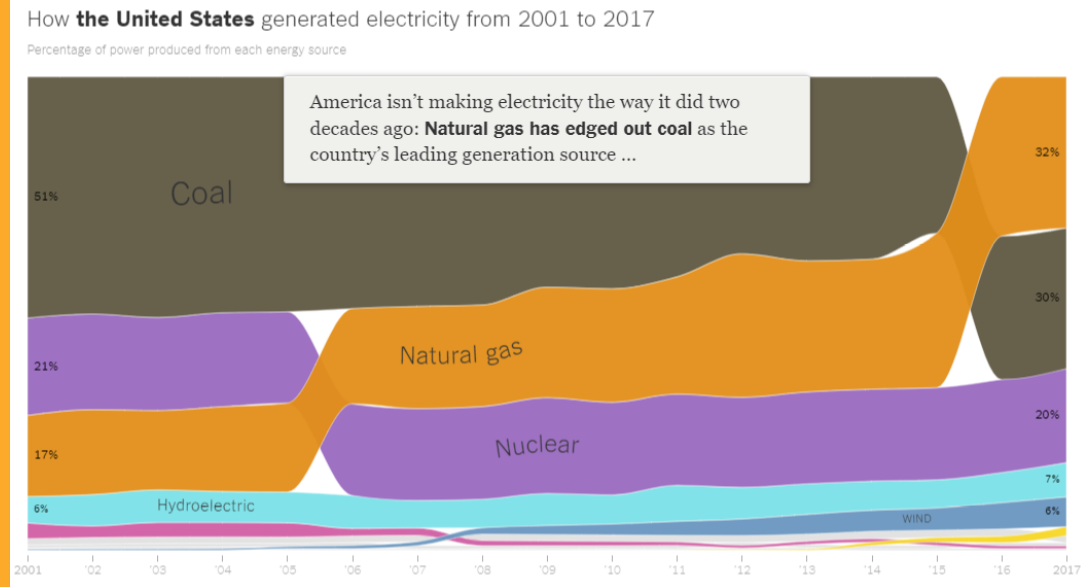
John Wiley, Biologist
U.S. Fish and Wildlife Service



Hydroelectric Power in the U.S.

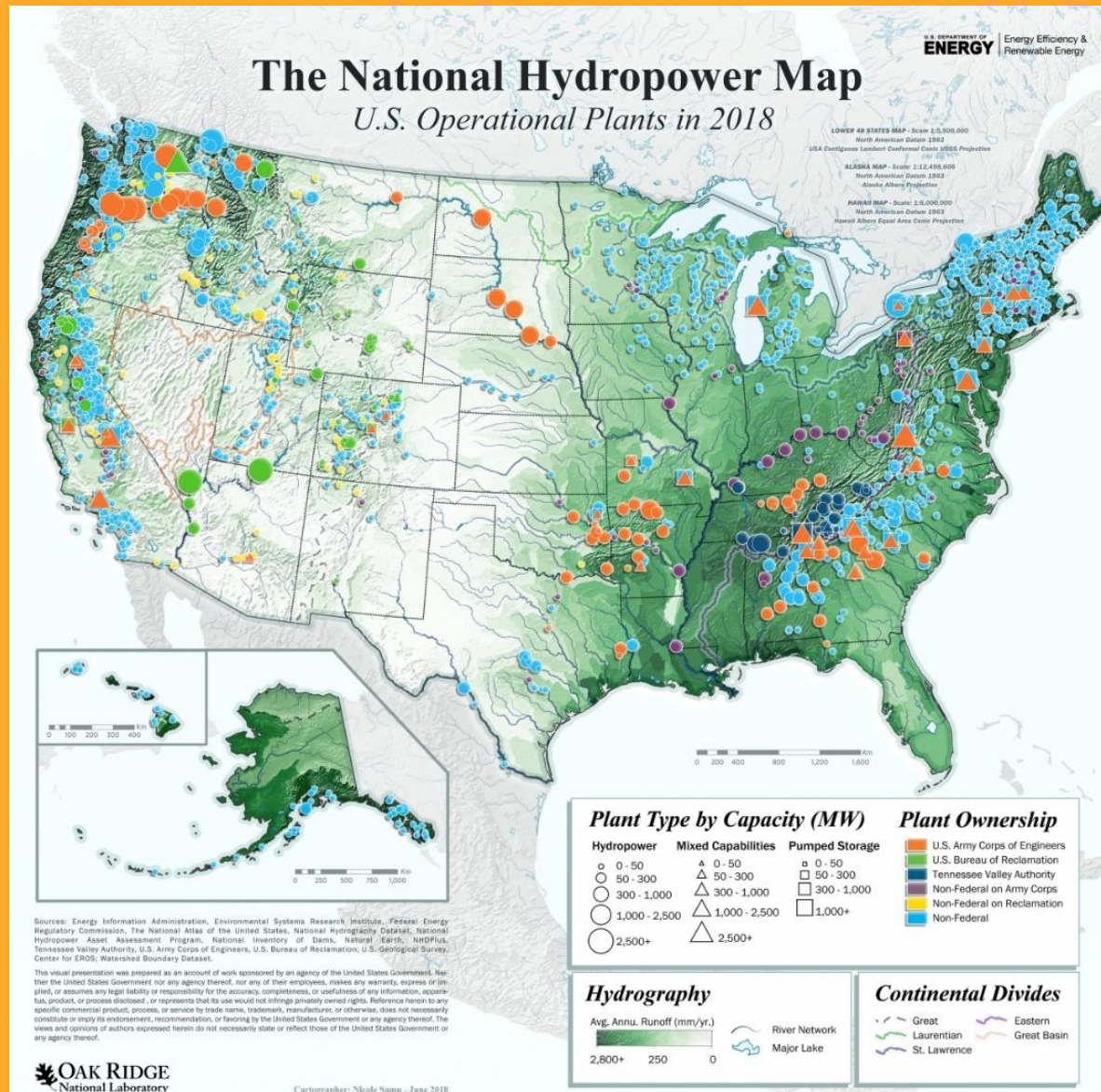
Energy source	Billion kWh	Share of total
Total - all sources	4,178	
Fossil fuels (total)	2,651	63.5%
Natural gas	1,468	35.1%
Coal	1,146	27.4%
Petroleum (total)	25	0.6%
Petroleum liquids	16	0.4%
Petroleum coke	9	0.2%
Other gases	12	0.3%
Nuclear	807	19.3%
Renewables (total)	713	17.1%
Hydropower	292	7.0%
Wind	275	6.6%
Biomass (total)	63	1.5%
Wood	41	1.0%
Landfill gas	11	0.3%
Municipal solid waste (biogenic)	7	0.2%
Other biomass waste	3	0.1%
Solar (total)	67	1.6%
Photovoltaic	63	1.5%
Solar thermal	4	0.1%
Geothermal	17	0.4%
Pumped storage hydropower ³	-6	-0.1%
Other sources	13	0.3%

2019. U.S. Energy Information Administration.



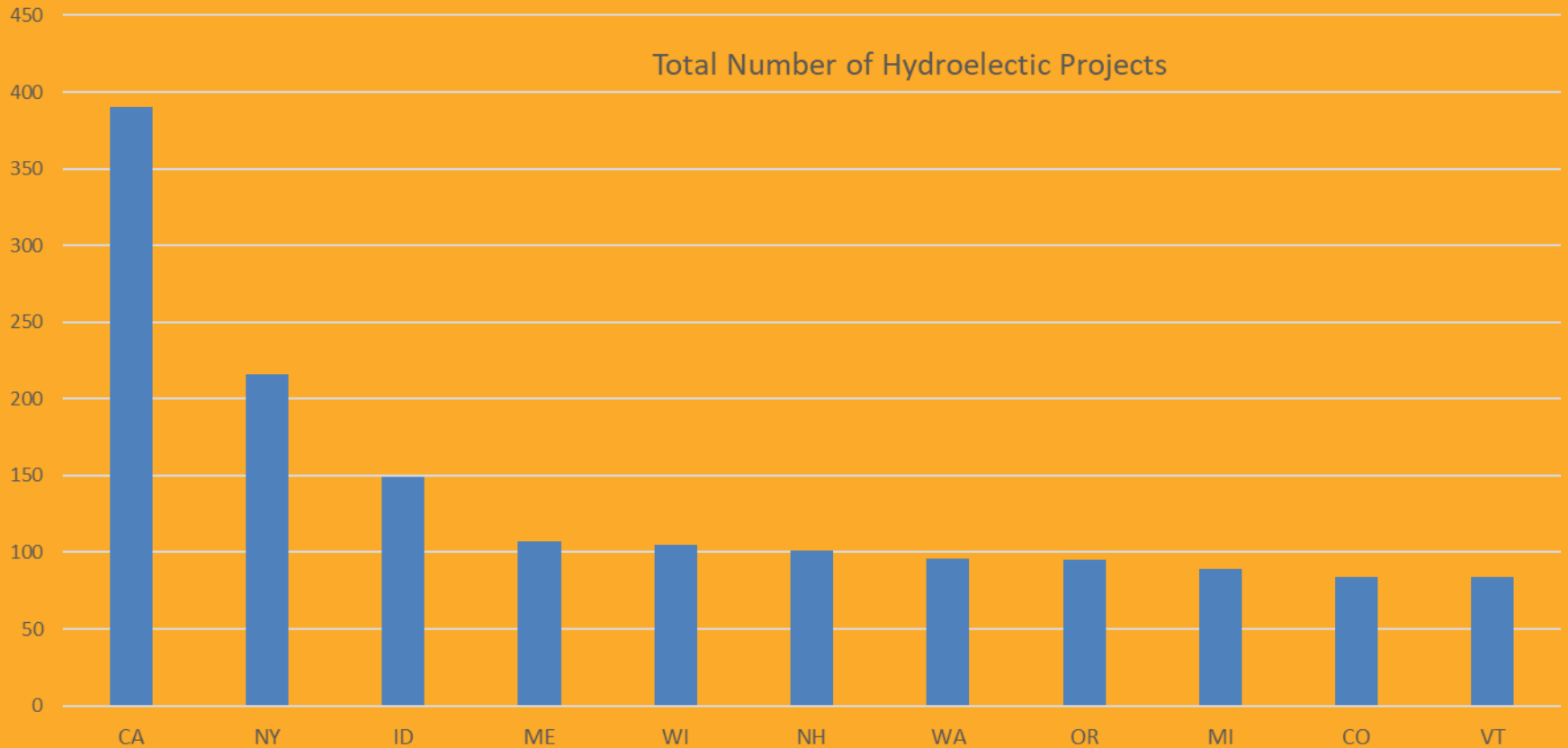
2018. Popovich. *New York Times*.

Hydroelectric Power in the U.S.



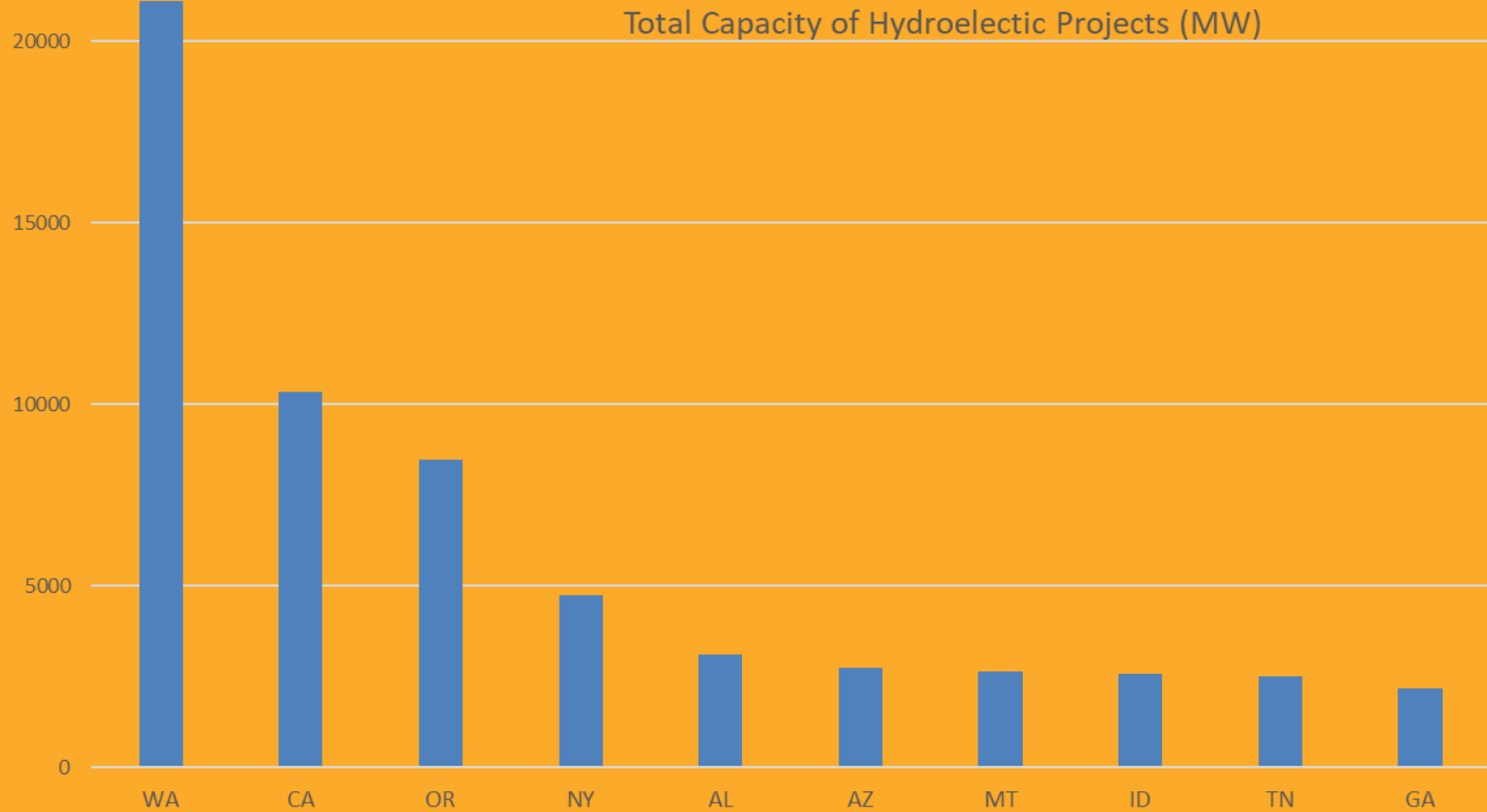
2018. U.S.
Department of
Energy

Hydroelectric Power in the U.S.



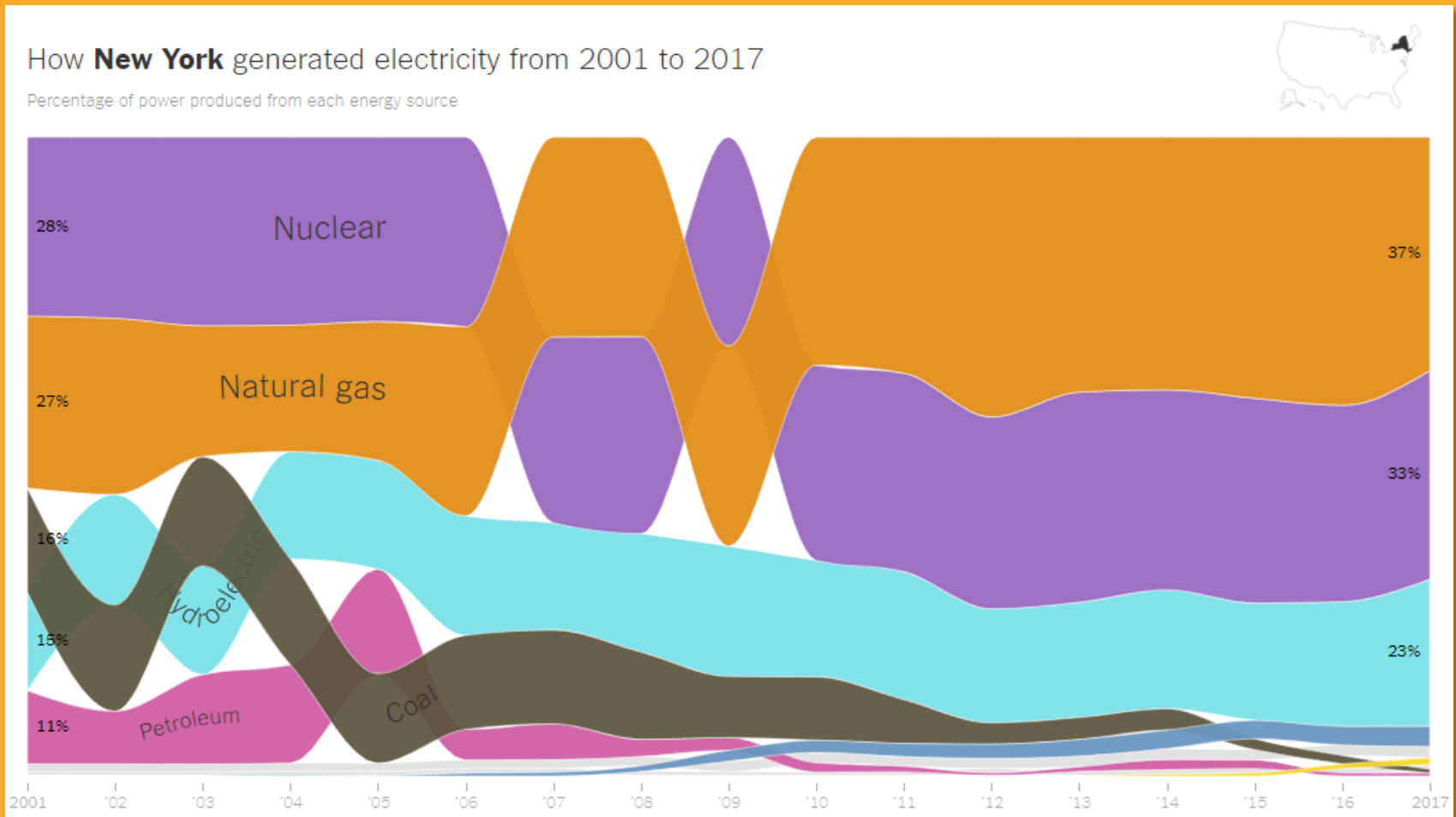
2019. U.S. Energy Information Administration.

Hydroelectric Power in the U.S.



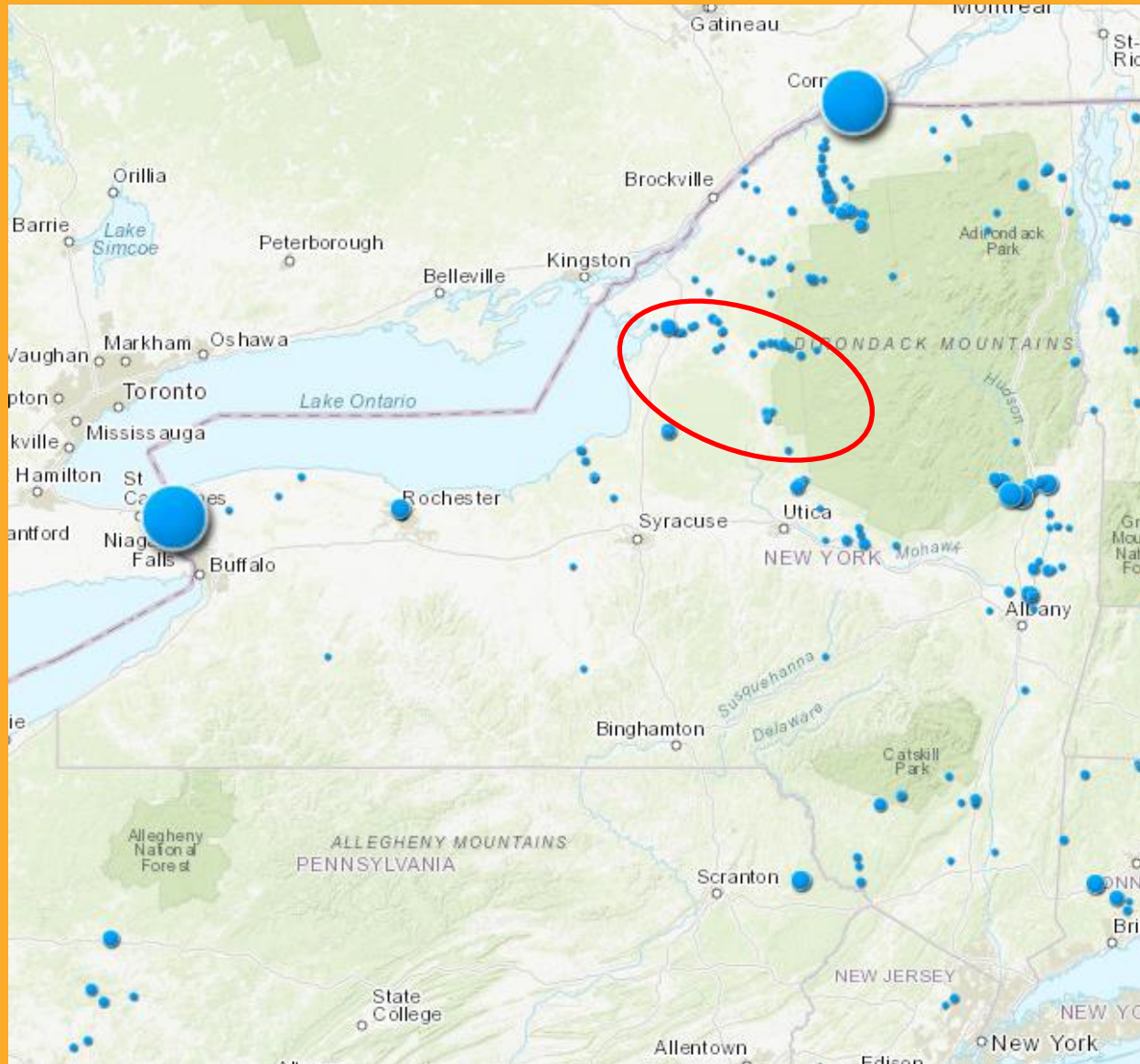
2019. U.S. Energy Information Administration.

Hydroelectric Power in New York



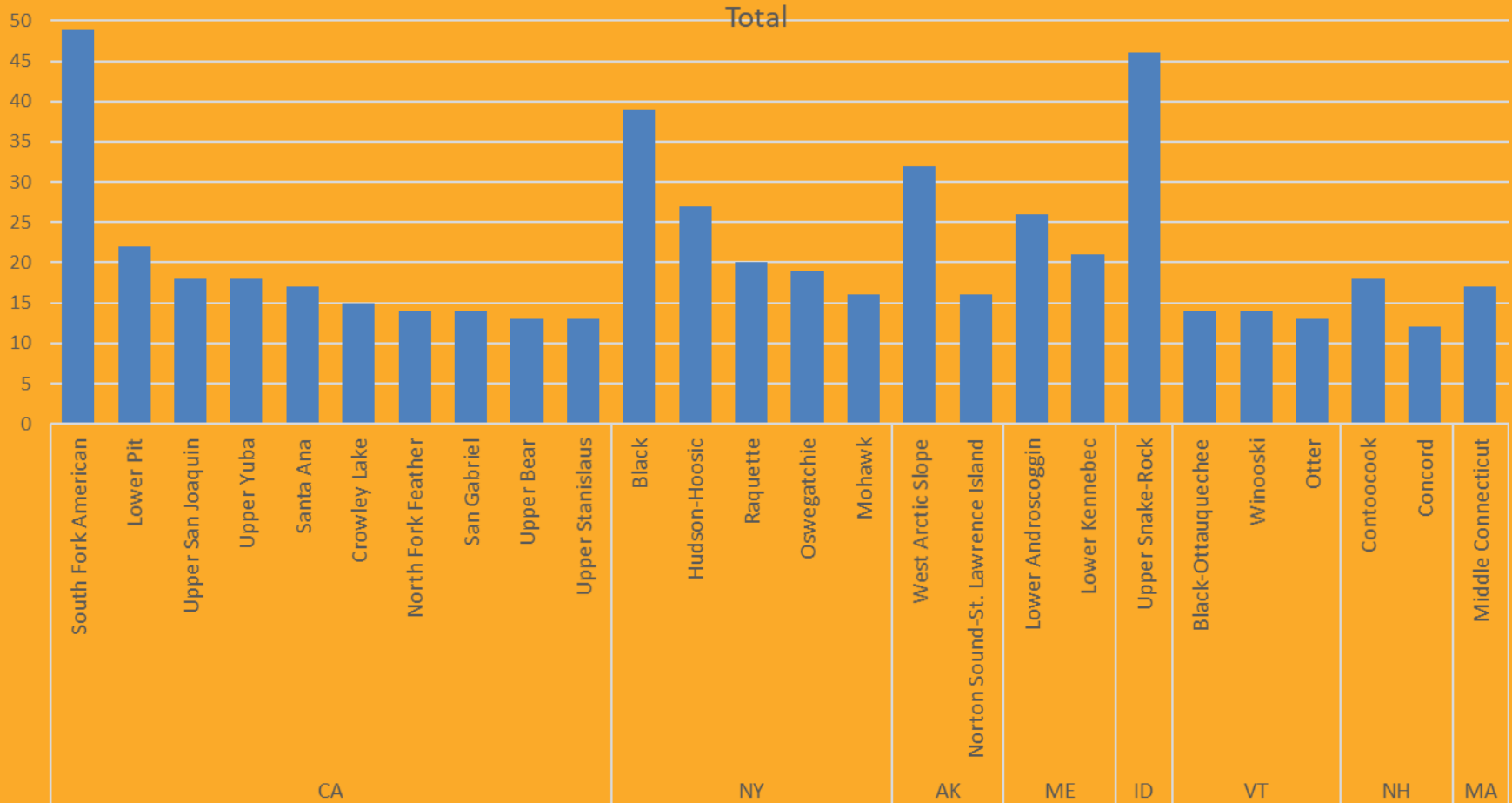
2018. Popovich. *New York Times*.

Hydroelectric Power in New York



2019. U.S. Energy Information Administration. ESRI Power Plants in the U.S. Map Viewer.

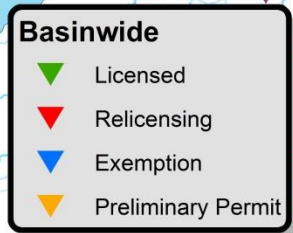
Black River: Third Most Heavily Developed Hydroelectric Watershed



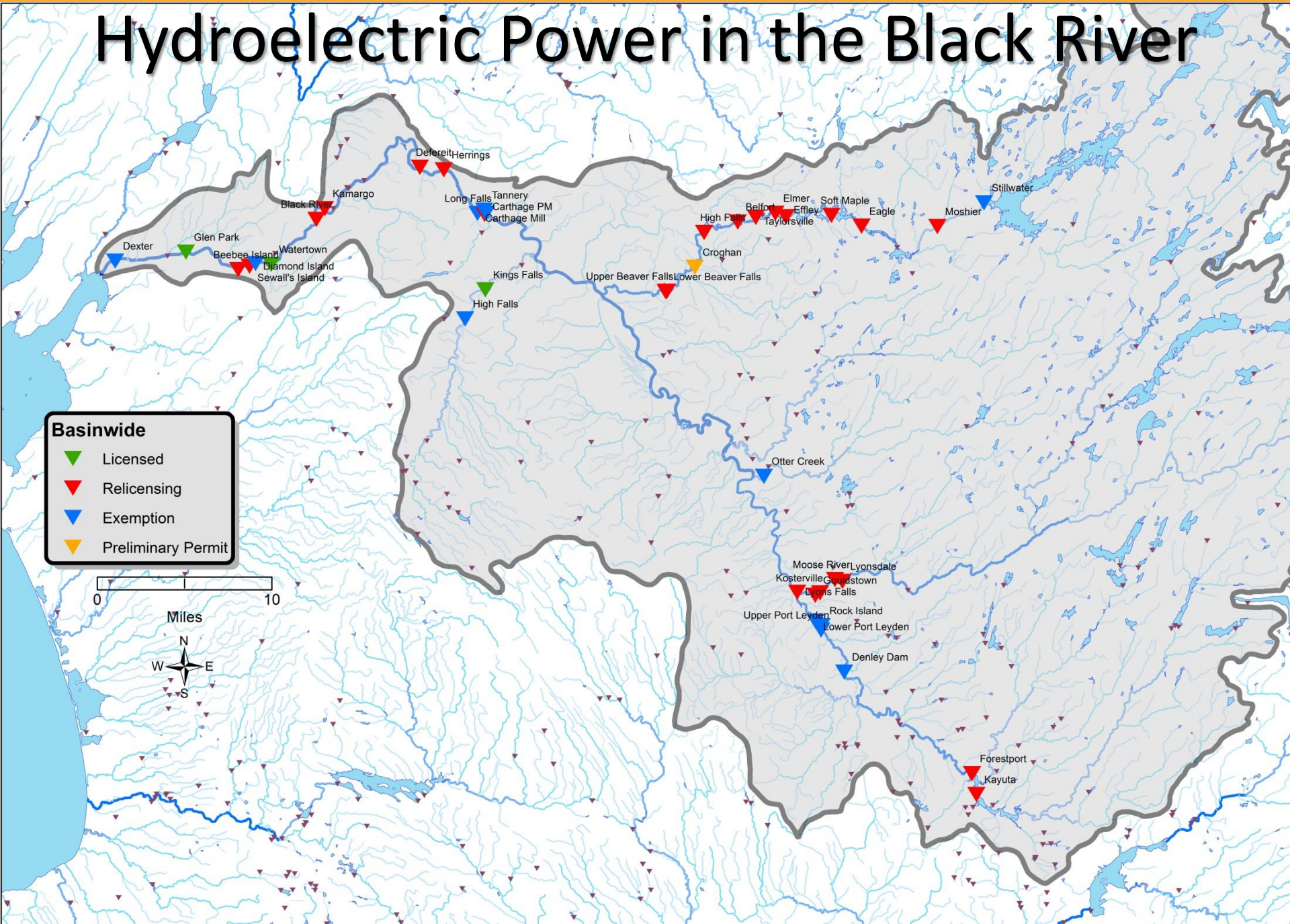
Black River Hydroelectric Projects

- 5 Waterways
 - Black River
 - Beaver River
 - Moose River
 - Deer River
 - Otter Creek
- Total of 182 MW of installed capacity
- 27 Licensed Projects with 40 Developments (154.4 MW)
 - Three larger multiple development projects
 - Beaver River – 8 developments (44.8 MW)
 - Black River – 5 developments (29.6 MW)
 - Lyons Falls – 3 developments (8.6 MW)
- 12 Exemptions (27.7 MW)
- 1 Preliminary Permit – Croghan (cancelled)

Hydroelectric Power in the Black River



0 10
Miles



Black River Hydroelectric Projects

PROJECT	NAME	DEVELOPMENT	RIVER	Site	Licensee	Status	Original Expiration	Current Expiration	Expiration Year	Capacity (Mw)
13630 Croghan		Croghan	Beaver River	3 Lewis County		PP	0	0	0	0
6743 Stillwater Reservoir		Stillwater	Beaver River	12 Mercer		E	0	0	0	1.85
2695 Dexter		Dexter	Black River	1 Enel		E	0	0	0	4.33
5801 Diamond Island		Diamond Island	Black River	9 Enel		E	0	0	0	1.2
Carthage Industrial										
5800 Carthage Mill		Carthage Mill	Black River	12 Development Corporation		E	0	0	0	5
4636 Long Falls		Long Falls	Black River	13 Ampersand		E	0	0	0	3.28
4908 Tannery Island		Tannery	Black River	14 Ampersand		E	0	0	0	1.5
6447 Lower Port Leyden		Lower Port Leyden	Black River	16 Enel		E	0	0	0	2.08
6380 Rock Island		Rock Island	Black River	17 Enel		E	0	0	0	1.9
6412 Upper Port Leyden		Upper Port Leyden	Black River	18 Empire Hydro Partners		E	0	0	0	1.1
5571 Denley Dam		Denley Dam	Black River	19 Enel		E	0	0	0	1.58
3754 High Falls		High Falls	Deer River	2 Enel		E	0	0	0	3.32
8841 Otter Creek		Otter Creek	Otter Creek	1 Silver Street		E	0	0	0	0.53
2823 Lower Beaver Falls		Lower Beaver Falls	Beaver River	1 Eagle Creek		R	2017-12-31	2017-12-31	2017	1
2593 Upper Beaver Falls		Upper Beaver Falls	Beaver River	2 Eagle Creek		R	2019-10-18	2017-12-31	2017	1.5
10887 Carthage Paper Makers		Carthage PM	Black River	15 Climax Manufacturing		R	2021-10-31	2021-10-31	2021	0.8
3255 Lyonsdale		Lyonsdale	Moose River	4 Cube		L	2023-02-28	2026-05-31	2026	3
5000 Kayuta		Kayuta	Black River	21 Ampersand		L	2024-08-31	2026-05-31	2026	0.4
2548 Lyons Falls		Lyons Falls	Black River	14 Kruger Energy		L	2026-05-31	2026-05-31	2026	5.39
2548 Lyons Falls		Gouldstown	Moose River	1 Kruger Energy		L	2026-05-31	2026-05-31	2026	2.25
2548 Lyons Falls		Kosterville	Moose River	2 Kruger Energy		L	2026-05-31	2026-05-31	2026	0.96
4349 Moose River		Moose River	Moose River	3 Energy Ottawa		L	2026-05-31	2026-05-31	2026	12.2
2645 Beaver River		High Falls	Beaver River	4 Brookfield		L,S	2026-07-31	2026-07-31	2026	4.7
2645 Beaver River		Belfort	Beaver River	5 Brookfield		L,S	2026-07-31	2026-07-31	2026	2
2645 Beaver River		Taylorsville	Beaver River	6 Brookfield		L,S	2026-07-31	2026-07-31	2026	4.6
2645 Beaver River		Elmer	Beaver River	7 Brookfield		L,S	2026-07-31	2026-07-31	2026	1.5
2645 Beaver River		Effley	Beaver River	8 Brookfield		L,S	2026-07-31	2026-07-31	2026	3
2645 Beaver River		Soft Maple	Beaver River	9 Brookfield		L,S	2026-07-31	2026-07-31	2026	15
2645 Beaver River		Eagle	Beaver River	10 Brookfield		L,S	2026-07-31	2026-07-31	2026	6
2645 Beaver River		Moshier	Beaver River	11 Brookfield		L,S	2026-07-31	2026-07-31	2026	8
2538 Beebee Island		Beebee Island	Black River	3 Brookfield		L,S	2026-11-30	2026-11-30	2026	8
2569 Black River		Sewall's Island	Black River	4 Brookfield		L,S	2026-11-30	2026-11-30	2026	2
2569 Black River		Black River	Black River	5 Brookfield		L,S	2026-11-30	2026-11-30	2026	6
2569 Black River		Kamargo	Black River	6 Brookfield		L,S	2026-11-30	2026-11-30	2026	5.4
2569 Black River		Defereit	Black River	7 Brookfield		L,S	2026-11-30	2026-11-30	2026	10.8
2569 Black River		Herrings	Black River	8 Brookfield		L,S	2026-11-30	2026-11-30	2026	5.4
4900 Forestport		Forestport	Black River	20 Ampersand		L	2027-02-28	2027-02-28	2027	3.3
4796 Glen Park		Glen Park	Black River	2 Cube		L	2032	2032	2032	32.65
2442 Watertown		Watertown	Black River	10 City of Watertown		L	2035	2035	2035	7.02
7352 Kings Falls		Kings Falls	Deer River	1 Silver Street		L	2036	2036	2036	1.5

- 26 Projects
- 39 Developments
- 182 MW

Status Codes

E - Exemption

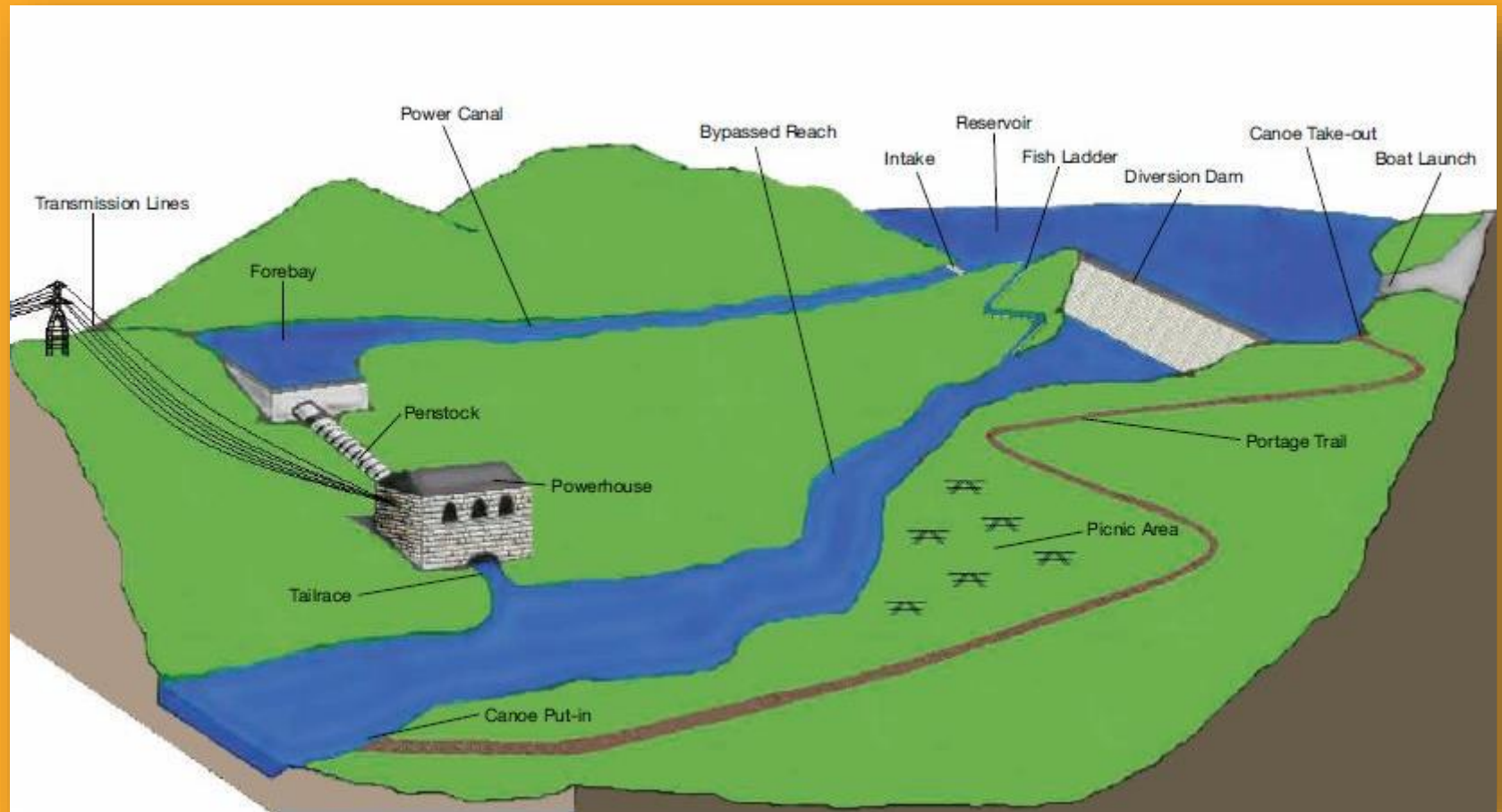
PP - Preliminary Permit

R - Currently Relicensing

L - License

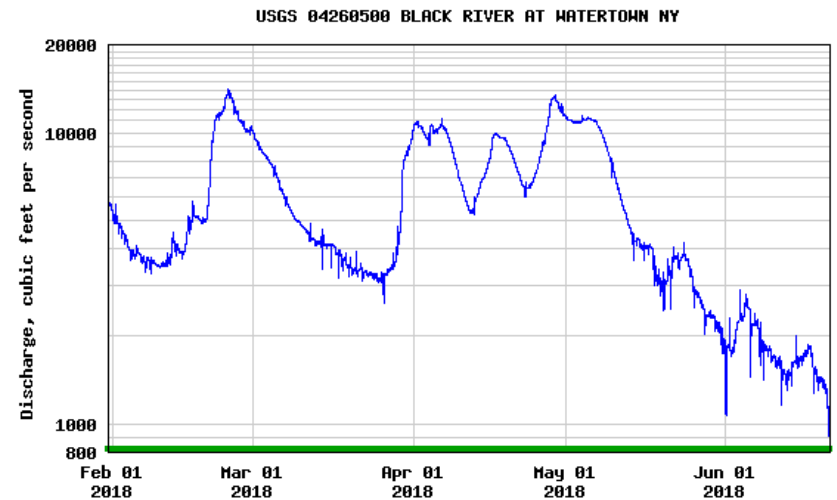
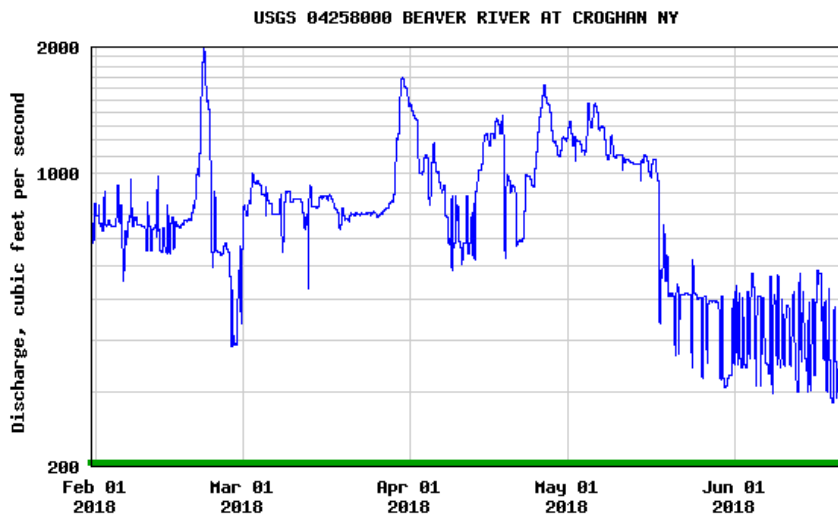
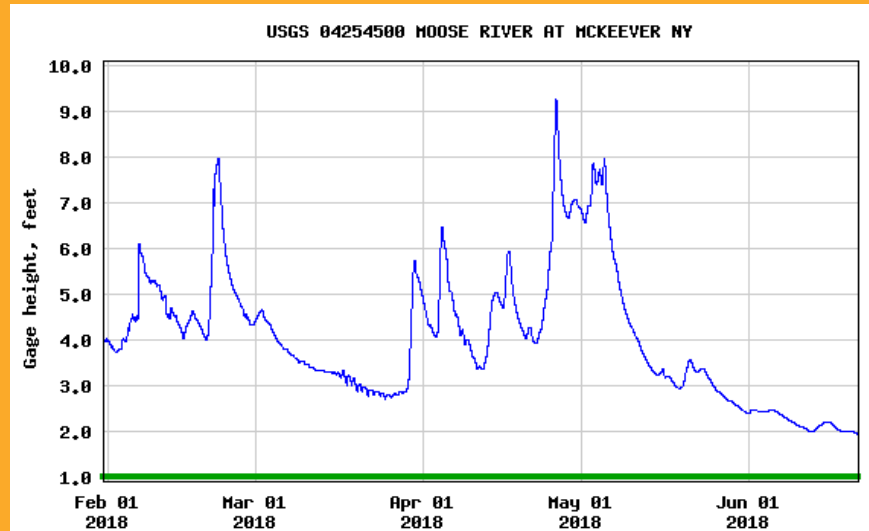
L,S - License with Settlement

Hydroelectric Project Works



Hydroelectric Project Operation

- Run-of-River
- Store and Release
- Peaking or Pulsing



Hydroelectric Project Impacts

- Flows
 - Decreased or lacking bypassed reach flows
 - Alterations and fluctuations in downstream flows
- Water Quality
 - Low dissolved oxygen
 - Higher or lower temperatures
- Aquatic Habitat
 - Impoundment fluctuations/shoreline habitat
 - Downstream fluctuations/shoreline habitat
 - Increased sedimentation and decreased sediment transport
 - Impacts to wetlands
- Aquatic Species
 - Reduced fish spawning and rearing
 - Fish entrainment and mortality
 - Reduced fish movement
 - Impacts to freshwater mussels
 - Impacts to macroinvertebrates
- Recreation
 - Lack of access to project lands
 - Lack of portage routes
 - Reduced variability in flows for flow dependent boating

The Federal Power Act



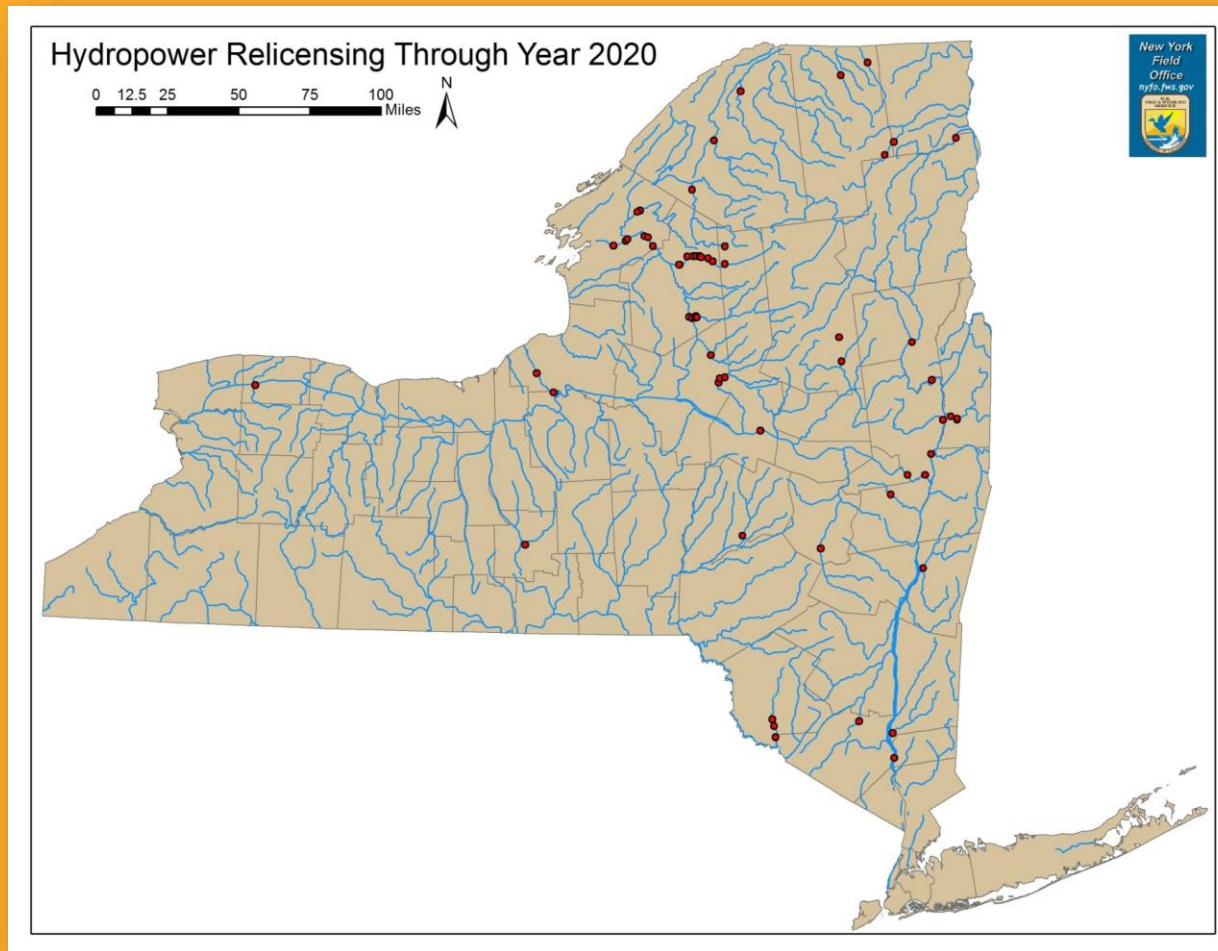
- Federal Energy Regulatory Commission (FERC)
 - The Commission, in addition to the power and development purposes for which licenses are issued, shall give equal consideration to the purposes of energy conservation, the protection, mitigation of damage to, and enhancement of, fish and wildlife (including related spawning grounds and habitat), the protection of recreational opportunities, and the preservation of other aspects of environmental quality.
- Licensees are required to consult with USFWS, States, Tribes, and stakeholders
 - Fishways
 - Clean Water Act (401 WQ Cert)
 - FWCA
 - ESA, NEPA, NHPA



Hydroelectric Project Protection Enhancement and Mitigation Measures

- Flows
 - Minimum or seasonal flows in the bypassed reaches
 - Minimum downstream base flows
 - Stream gauging
- Water Quality
 - Water quality monitoring
 - Intake depth modification
 - Increased flow quantity
- Aquatic Habitat
 - Seasonal and maximum impoundment fluctuation limits
 - Downstream fluctuations/shoreline habitat
 - Sediment management plans
 - Habitat improvement projects
- Aquatic Species
 - Habitat improvement projects
 - Fish protection and exclusion structures
 - Upstream and downstream fish passage facilities
 - Drawdown limitations
 - Mussel translocation
 - Flows for macroinvertebrate habitat
- Recreation
 - Construction of recreation facilities (beach, campground, public access, trails, etc.)
 - Development and maintenance of portage routes
 - Whitewater flow releases
 - Aesthetic flows
- Funds
 - BRACs and Watertown Fund

Relicensing in New York



Black River Basin Projects Table

PROJECT	NAME	DEVELOPMENT	RIVER	Site	Licensee	Status	Original Expiration	Current Expiration	Expiration Year	Capacity (Mw)
13630 Croghan		Croghan	Beaver River	3 Lewis County		PP	0	0	0	0
6743 Stillwater Reservoir		Stillwater	Beaver River	12 Mercer		E	0	0	0	1.85
2695 Dexter		Dexter	Black River	1 Enel		E	0	0	0	4.33
5801 Diamond Island		Diamond Island	Black River	9 Enel		E	0	0	0	1.2
5800 Carthage Mill		Carthage Mill	Black River	12 Development Corporation	Carthage Industrial	E	0	0	0	5
4636 Long Falls		Long Falls	Black River	13 Ampersand		E	0	0	0	3.28
4908 Tannery Island		Tannery	Black River	14 Ampersand		E	0	0	0	1.5
6447 Lower Port Leyden		Lower Port Leyden	Black River	16 Enel		E	0	0	0	2.08
6380 Rock Island		Rock Island	Black River	17 Enel		E	0	0	0	1.9
6412 Upper Port Leyden		Upper Port Leyden	Black River	18 Empire Hydro Partners		E	0	0	0	1.1
5571 Denley Dam		Denley Dam	Black River	19 Enel		E	0	0	0	1.58
3754 High Falls		High Falls	Deer River	2 Enel		E	0	0	0	3.32
8841 Otter Creek		Otter Creek	Otter Creek	1 Silver Street		E	0	0	0	0.53
2823 Lower Beaver Falls		Lower Beaver Falls	Beaver River	1 Eagle Creek		R	2017-12-31	2017-12-31	2017	1
2593 Upper Beaver Falls		Upper Beaver Falls	Beaver River	2 Eagle Creek		R	2019-10-18	2017-12-31	2017	1.5
10887 Carthage Paper Makers		Carthage PM	Black River	15 Climax Manufacturing		R	2021-10-31	2021-10-31	2021	0.8
3255 Lyonsdale		Lyonsdale	Moose River	4 Cube		L	2023-02-28	2026-05-31	2026	3
5000 Kayuta		Kayuta	Black River	21 Ampersand		L	2024-08-31	2026-05-31	2026	0.4
2548 Lyons Falls		Lyons Falls	Black River	14 Kruger Energy		L	2026-05-31	2026-05-31	2026	5.39
2548 Lyons Falls		Gouldstown	Moose River	1 Kruger Energy		L	2026-05-31	2026-05-31	2026	2.25
2548 Lyons Falls		Kosterville	Moose River	2 Kruger Energy		L	2026-05-31	2026-05-31	2026	0.96
4349 Moose River		Moose River	Moose River	3 Energy Ottawa		L	2026-05-31	2026-05-31	2026	12.2
2645 Beaver River		High Falls	Beaver River	4 Brookfield		L,S	2026-07-31	2026-07-31	2026	4.7
2645 Beaver River		Belfort	Beaver River	5 Brookfield		L,S	2026-07-31	2026-07-31	2026	2
2645 Beaver River		Taylorsville	Beaver River	6 Brookfield		L,S	2026-07-31	2026-07-31	2026	4.6
2645 Beaver River		Elmer	Beaver River	7 Brookfield		L,S	2026-07-31	2026-07-31	2026	1.5
2645 Beaver River		Effley	Beaver River	8 Brookfield		L,S	2026-07-31	2026-07-31	2026	3
2645 Beaver River		Soft Maple	Beaver River	9 Brookfield		L,S	2026-07-31	2026-07-31	2026	15
2645 Beaver River		Eagle	Beaver River	10 Brookfield		L,S	2026-07-31	2026-07-31	2026	6
2645 Beaver River		Moshier	Beaver River	11 Brookfield		L,S	2026-07-31	2026-07-31	2026	8
2538 Beebee Island		Beebee Island	Black River	3 Brookfield		L,S	2026-11-30	2026-11-30	2026	8
2569 Black River		Sewall's Island	Black River	4 Brookfield		L,S	2026-11-30	2026-11-30	2026	2
2569 Black River		Black River	Black River	5 Brookfield		L,S	2026-11-30	2026-11-30	2026	6
2569 Black River		Kamargo	Black River	6 Brookfield		L,S	2026-11-30	2026-11-30	2026	5.4
2569 Black River		Defereit	Black River	7 Brookfield		L,S	2026-11-30	2026-11-30	2026	10.8
2569 Black River		Herrings	Black River	8 Brookfield		L,S	2026-11-30	2026-11-30	2026	5.4
4900 Forestport		Forestport	Black River	20 Ampersand		L	2027-02-28	2027-02-28	2027	3.3
4796 Glen Park		Glen Park	Black River	2 Cube		L	2032	2032	2032	32.65
2442 Watertown		Watertown	Black River	10 City of Watertown		L	2035	2035	2035	7.02
7352 Kings Falls		Kings Falls	Deer River	1 Silver Street		L	2036	2036	2036	1.5

- 9 Projects
- 22 Developments
- 6 Licensees

Status Codes

E - Exemption

PP - Preliminary Permit

R - Currently Relicensing

L - License

Upcoming Relicensings

- 2017 (2) – Upper and Lower Beaver Falls
-

- 2021 (1) – Carthage Papermakers
 - 2026 (20) – Moose River, Lyons Falls, Black River, Beaver River, Beebee Island, Lyonsdale*, Kayuta*
 - 2027 (1) – Forestport
-

- 2032-2036 (3) – Glen Park, Watertown, Kings Falls

Relicensing Processes

• Three Options

– Integrated Licensing Process (ILP)

- default, expensive, larger/controversial projects

– Traditional Licensing Process (TLP)

- optional, cheaper, smaller/non-controversial projects

– Alternative Licensing Process (ALP)

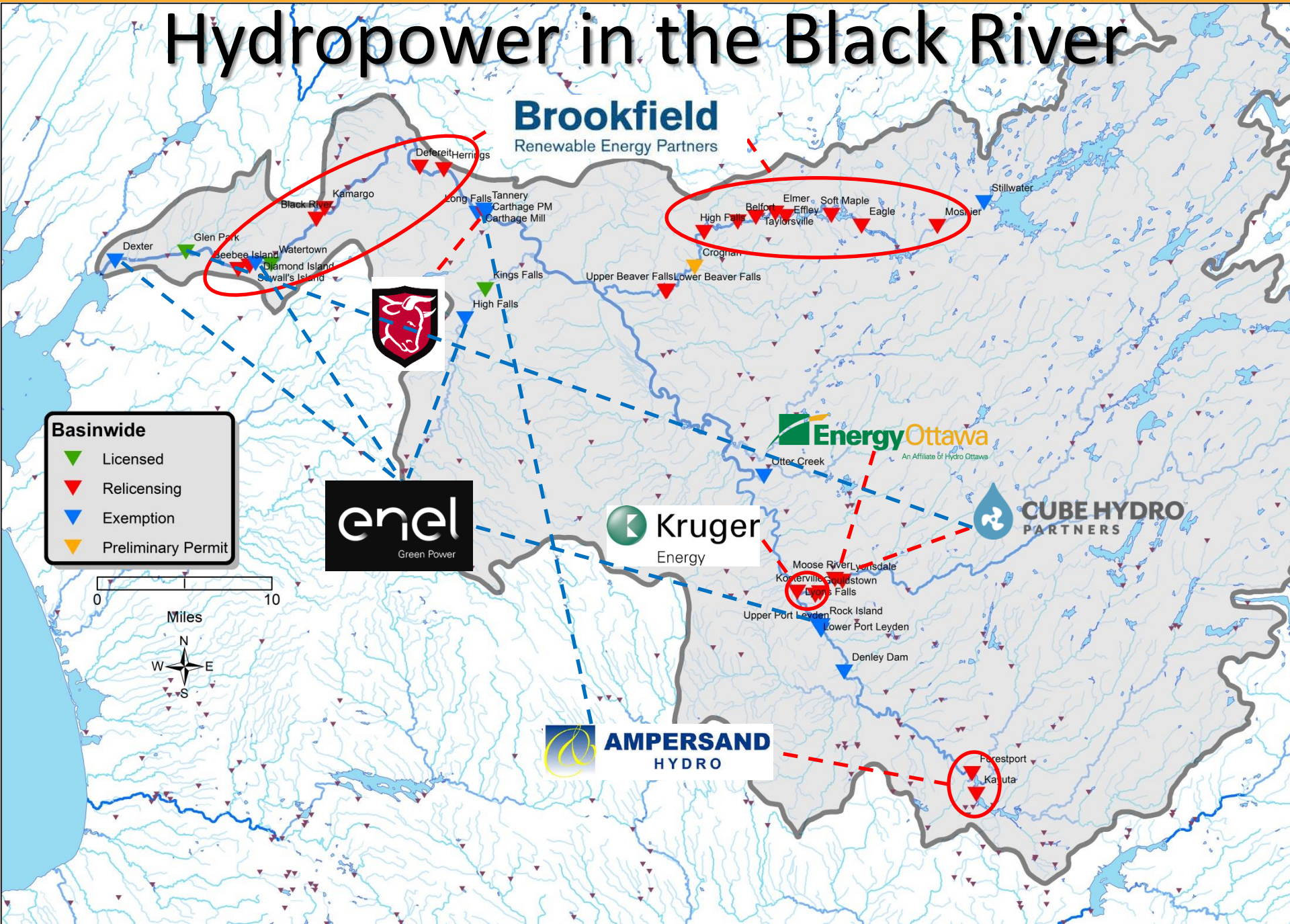
- less common, collaborative/flexible, used for complex or novel proceedings

Typical Timeline

- NOI/PAD – 5 years prior
 - Study Plan – 4-5 years prior
 - Studies – 3-4 years prior
 - Final License Application Due – 2 years prior
 - License Expiration
-
- “Relicensing, then, is more akin to an irreversible and irretrievable commitment of a public resource than a mere continuation of the status quo. Simply because the same resource had been committed in the past does not make relicensing a phase in a continuous activity.”



Hydropower in the Black River



Hydroelectric Power in New York



Basin-Wide Approaches to Hydropower Relicensing: Case Studies and Considerations

Taylor L. Curtis and Heather Buchanan

National Renewable Energy Laboratory

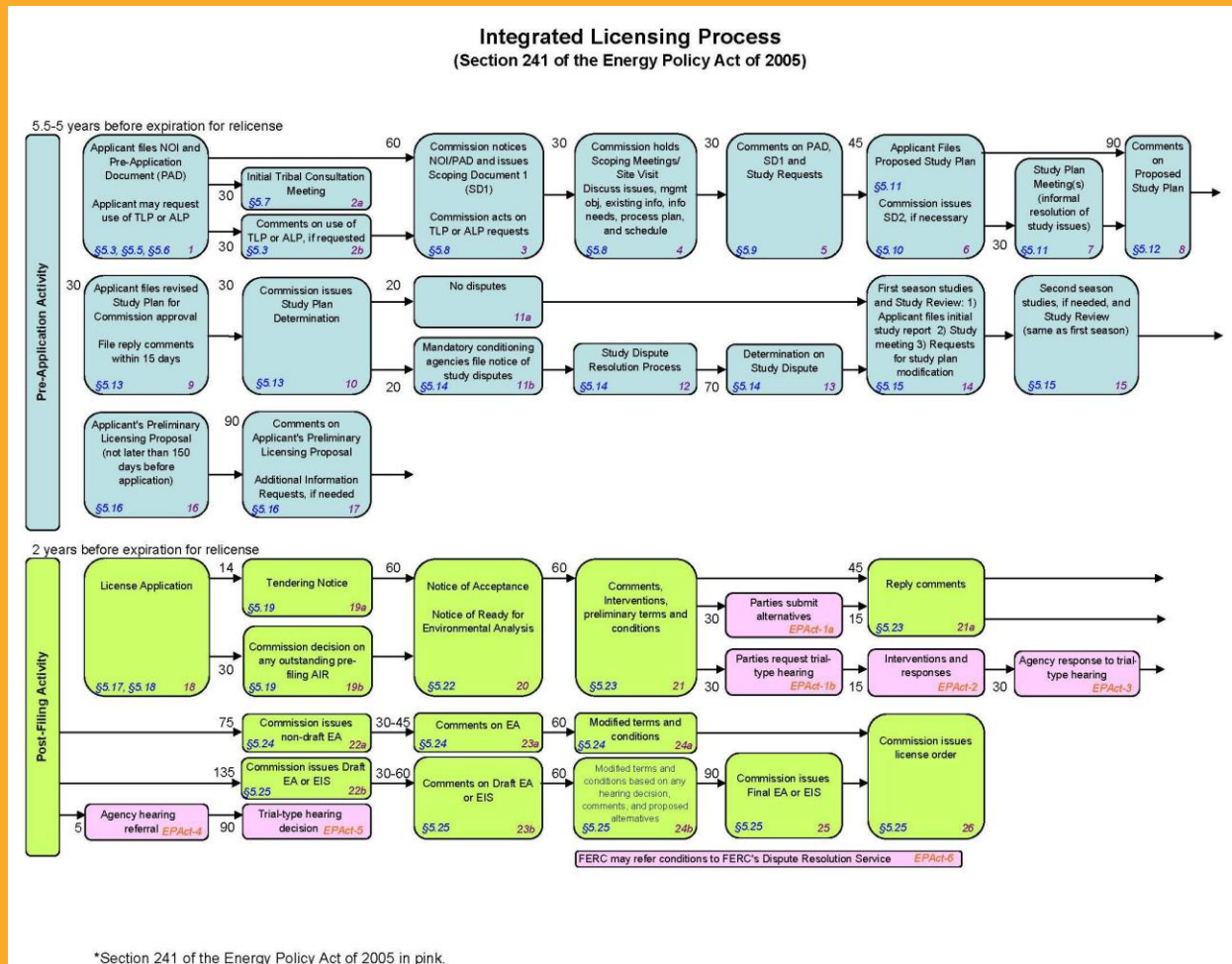
NREL is a national laboratory of the U.S. Department of Energy
Office of Energy Efficiency & Renewable Energy
Operated by the Alliance for Sustainable Energy, LLC

This report is available at no cost from the National Renewable Energy
Laboratory (NREL) at www.nrel.gov/publications.

Contract No. DE-AC36-08GO28308

Technical Report
NREL/TP-6A20-71979
January 2019

Potential Basinwide Timeline for Relicensing



Keep Informed

- FERC e-Library and e-Subscription



FERC Federal Energy Regulatory Commission

Enter Search Term(s):

ABOUT MEDIA DOCUMENTS & FILINGS INDUSTRIES LEGAL RESOURCES MARKET OVERSIGHT ENFORCEMENT CAREERS CONTACT

Decisions & Notices
Notice Formats
FERC Online
eComment
eRegister
eFiling
eSubscription
eService
eLibrary
What is eLibrary?
Key Features
Tips for Searching
Accessibility Tips
Standards for Descriptions of Documents Submitted to

Documents & Filing >> FERC Online >> eLibrary

eLibrary TEXT SIZE S M L

Access documents issued and received by FERC

Can't find what you're looking for in Advanced or General Search Functions? Try Docket or Daily Search functions.

Search Options

- » [General Search](#)
- » [Advanced Search](#)
- » [Daily Filings/Issuances \("Daily Search"\)](#)
- » [Search New Docket Numbers \("New Dockets"\)](#)
- » [Docket Search](#)
- » [eLibrary Alternate Site](#)

P-2538	Beebee Island
P-2569	Black River
P-10887	Carthage Paper
P-2645	Beaver River
P-2548	Lyons Falls
P-4349	Moose River
P-3255	Lyonsdale
P-4900	Forestport
P-5000	Kayuta