The New York State Museum Core, Cuttings, and Well Log Collection:

A Valuable yet Underutilized(?) Resource

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ESOGIS
Empire State Organized Geologic Information System

Abstract

The New York State Museum curates a large collection of geologic data from well drilling operations across the state. This collection includes bedrock rock cores, cuttings, well logs, production data, and associated paperwork for many of the 40,000+ deep wells in New York State. Well logs and paperwork are actively being scanned, and in some cases digitized, for use with interpretative software such as Petra or GeoGraphix. The 400+ bedrock cores in this collection vary in length, diameter, and geographic location while sampling nearly every formation in the state at depths ranging from less than 100 feet to over 13,000 feet. The well cuttings collection includes rock material from over 2,000 wells sampled at 10 foot intervals during drilling.

The data collected on well logs, combined with the analyses that can be run on core and cuttings material, provide an invaluable group of tools for studying the subsurface geology of New York as well as the surrounding states. The rock properties found in a single core can be linked to that well's log signature, then correlated across some of the 14,000+ wells for which we have logs. Isopach maps, structure contour maps, and detailed cross sections can be constructed to illustrate stratigraphic changes across areas from a few miles to hundreds of miles wide.

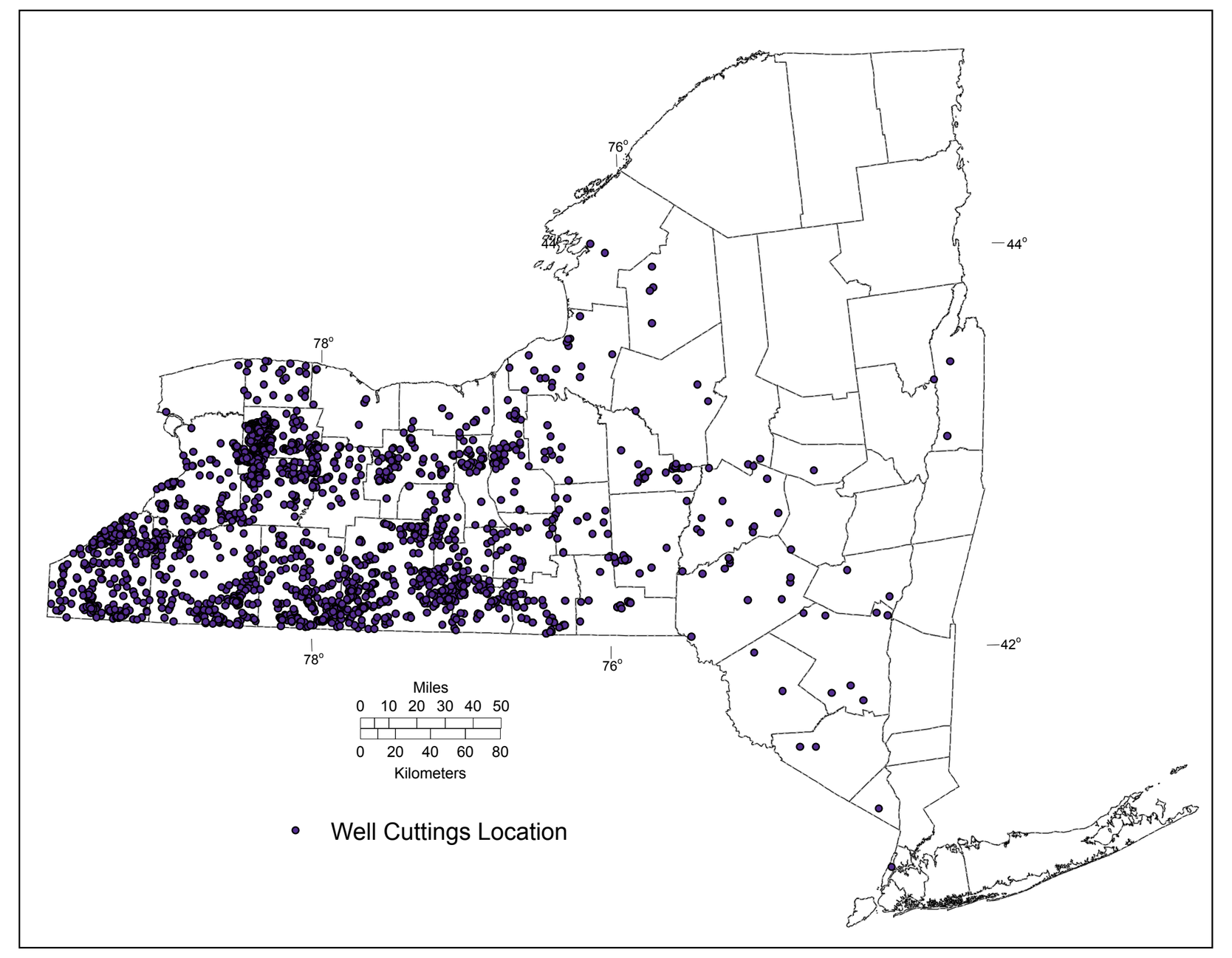
The contents of the museum's core, cuttings, and well log collection are all publicly available for study. Scanned logs and other well information can be accessed through the Empire State Organized Geologic Information System (ESOGIS), while requests to study or sample core or cuttings material can be made directly to the museum. The ESOGIS database commonly receives over 600 visits per month, however requests to access the museum's core or cuttings material number less than 20 per year. Efforts to further organize and publicize the availability of this valuable collection are currently under way.

CUTTINGS

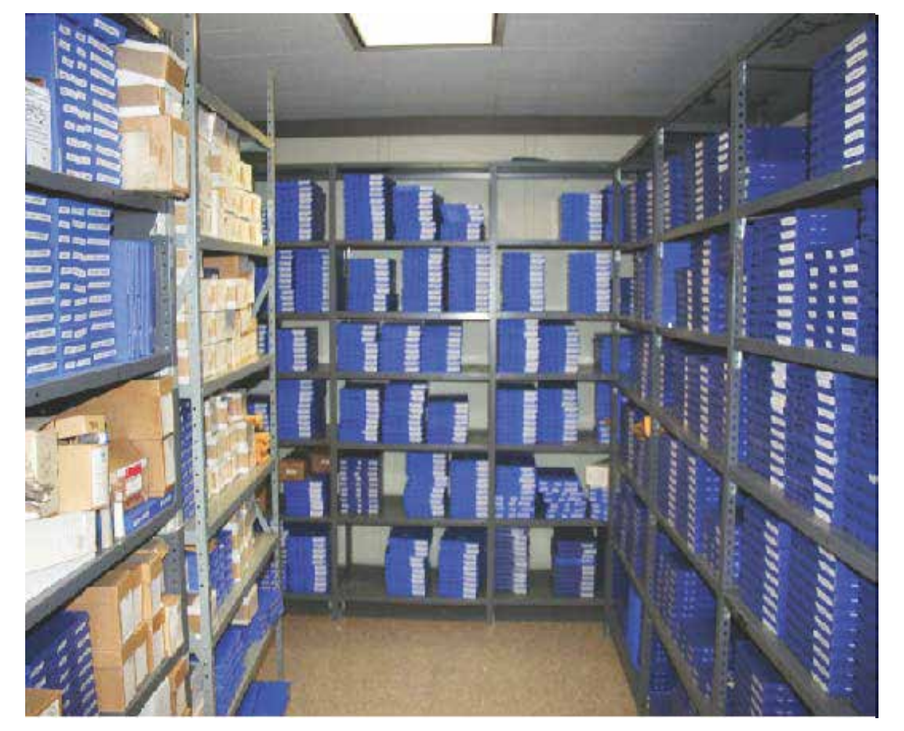
Cuttings are small pieces of rock that circulate to the surface during normal drilling operations. These pieces are often collected at regular intervals and submitted to the state as a requirement by the Department of Environmental Conservation.

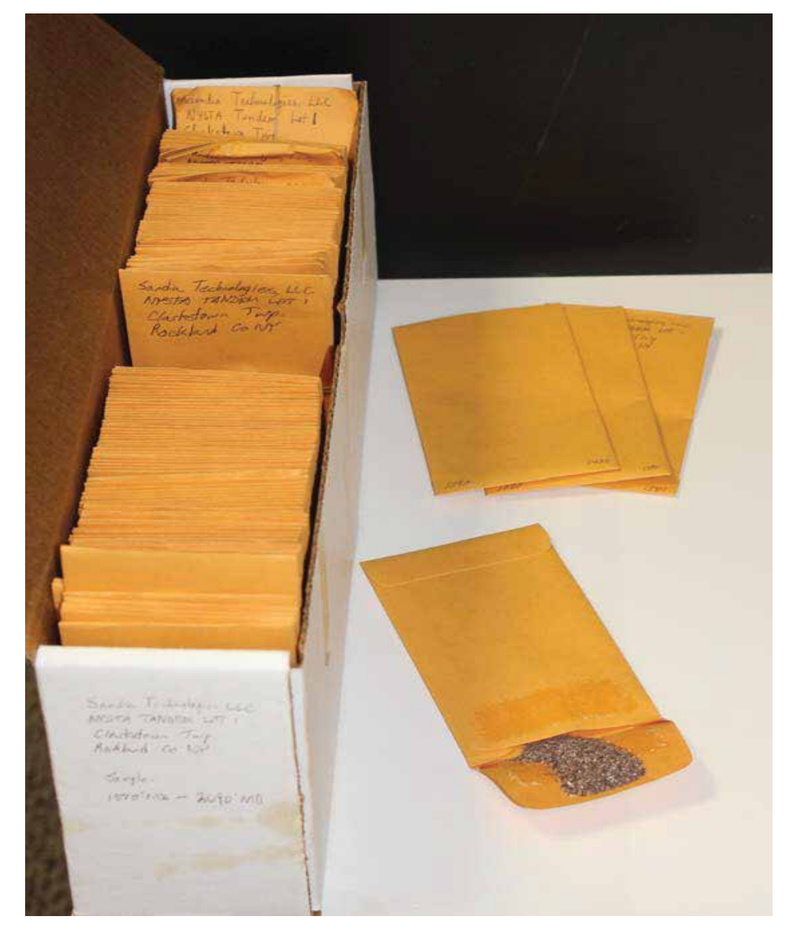
Cuttings collected and bagged at the drill site

Cuttings stored in clear vials at the museum



The museum's cuttings collection contains samples from over 2,300 wells across the state.



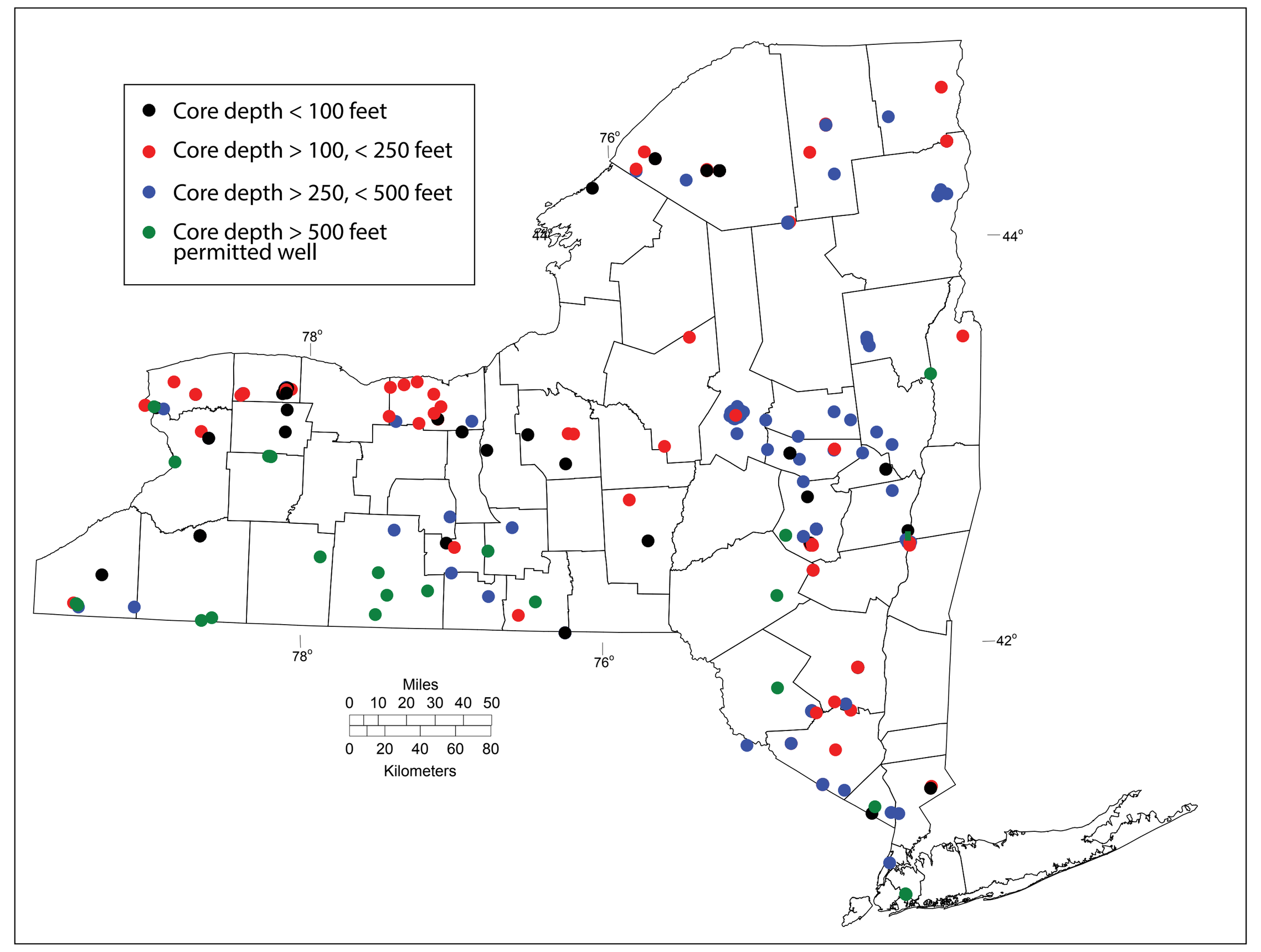


Cuttings stored in paper envelopes at the museum

Cuttings have several uses including stratigraphic unit identification, geochemical analyses, minerology, and fluid inclusion studies, among many others. While generally not as useful as core, cuttings offer a suitable substitute in places where core is not available. This collection may be sampled for research purposes using the museum's "technical analysis/destructive sampling request form" available upon request.

CORE

The New York State Museum stores and maintains bedrock cores from over 400 wells across the state. These cores vary in depth, length, and diameter. Access to the collection is publicly available for research and educational purposes. Due to the vast size of the collection, portions are stored at both the museum and an off-site facility in Rotterdam.



Manhattan Schist from the JFK#3 well drilled on Long Island

Dolomitized Trenton Formation from the Whiteman #1 well in Chemung County

A piece of Silurian salt core from central New York

Marcellus Shale from the Beaver Meadows well in Chenango County

Cores laid out in sequence to be studied at the museum

An aisle of core at the museum's storage facility in Rotterdam

As with all other museum specimens, the core collection requires frequent attention including routine maintenance such as inventorying and reboxing, as well as research-related tasks like slabbing, plugging, photography, and core description.

SUBSEQUENT MATERIALS

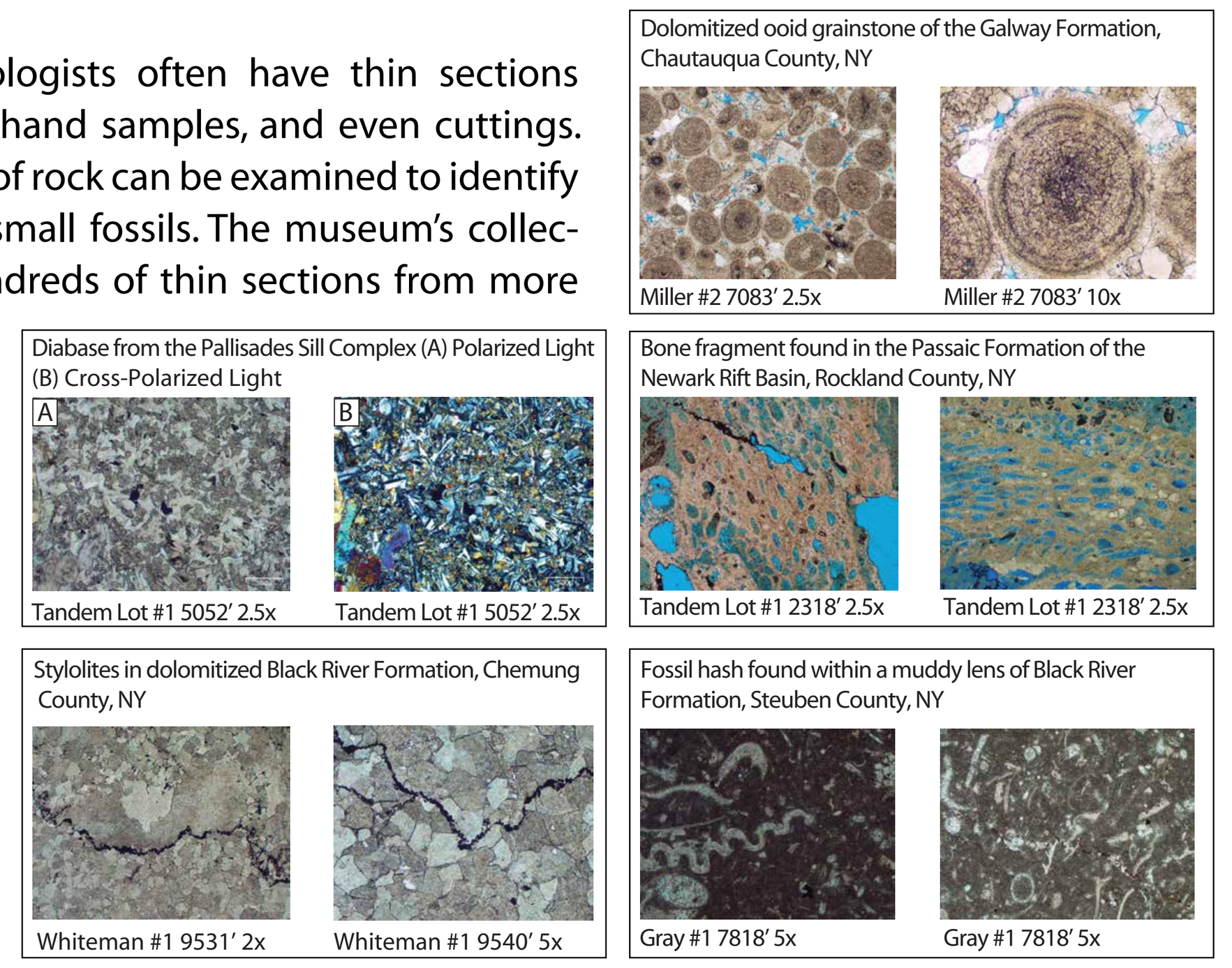
Geologic analyses conducted on museum specimens often leave residual material once the research is complete. These by-products are all kept and preserved for future research so that the original specimen are not unnessarily re-sampled.

Core Plugs

Cores are often plugged to retrieve a sample for thin sectioning, however, only a portion of a plug is needed to create a thin section. The museum maintains a collection of over 100 plug remainders that can be used for further analyses.

Thin Sections

During their research, geologists often have thin sections made from pieces of core, hand samples, and even cuttings. These extremely thin slices of rock can be examined to identify minerals, grain types, and small fossils. The museum's collection currently contains hundreds of thin sections from more than 20 different locations.



Dolomitized ooid grainstone of the Galway Formation, Chautauqua County, NY
Miller #2 7083' 2.5x — Miller #2 7083' 10x

Diabase from the Pallisades Sill Complex (A) Polarized Light (B) Cross-Polarized Light
Tandem Lot #1 5052' 2.5x — Tandem Lot #1 5052' 2.5x

Bone fragment found in the Passaic Formation of the Newark Rift Basin, Rockland County, NY
Tandem Lot #1 2318' 2.5x — Tandem Lot #1 2318' 2.5x

Stylolites in dolomitized Black River Formation, Chemung County, NY
Whiteman #1 9531' 2x — Whiteman #1 9540' 5x

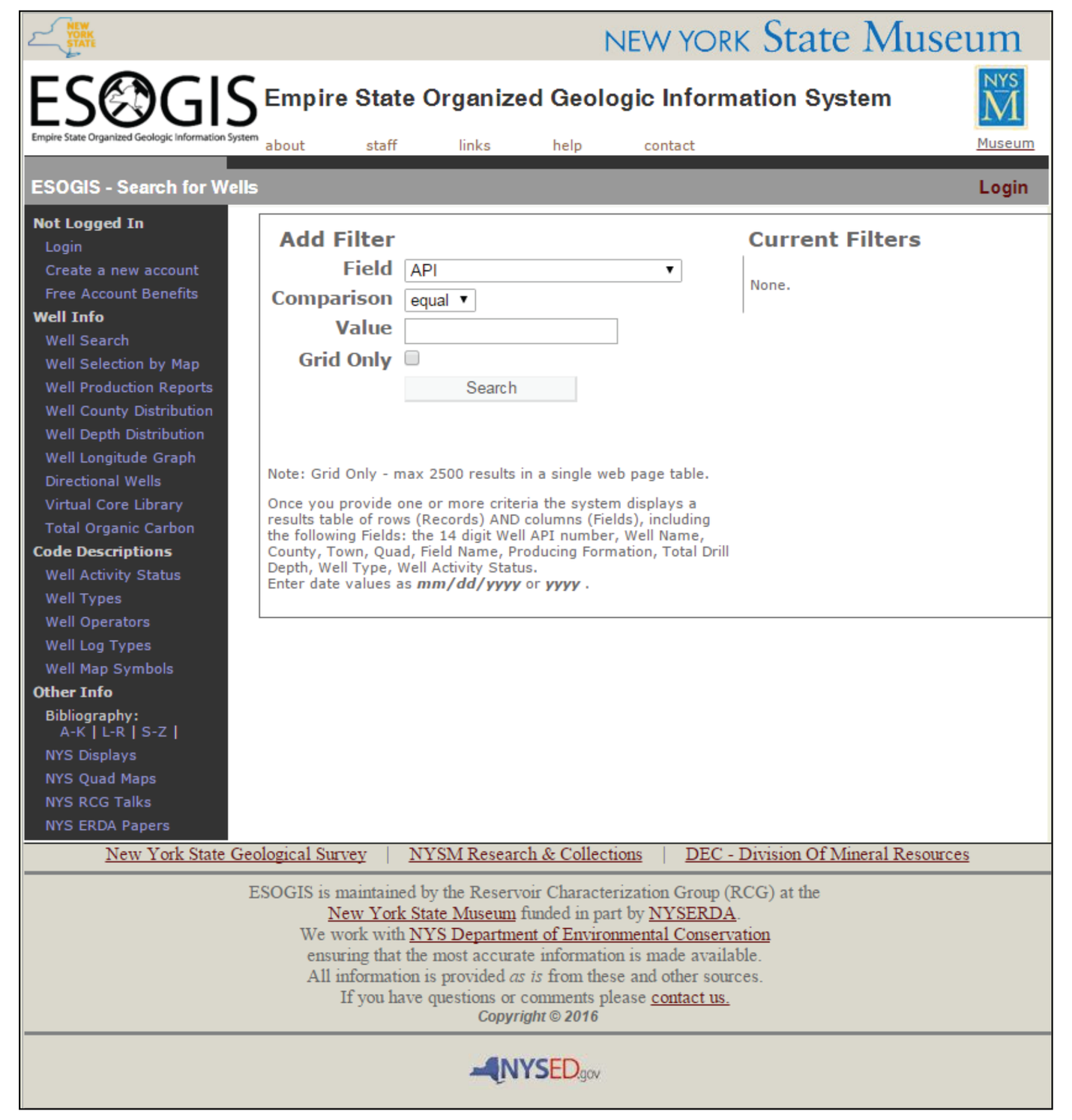
Fossil hash found within a muddy lens of Black River Formation, Steuben County, NY
Gray #1 7818' 5x — Gray #1 7818' 5x

Thin Section Billets

A billet is a portion of rock sample embedded in epoxy and used to create a thin section. It can be used to make additional thin sections without the need for re-sampling. The museum maintains a collection of hundreds of thin section billets.

ESOGIS

The Empire State Organized Geologic Information System (ESOGIS) is an online database for deep wells in New York State. ESOGIS allows users to query and view data for all of New York's 40,000+ deep wells. The amount of available data varies from well to well, however most records include well logs, formation tops, production data, and paperwork such as drilling permits and completion reports.



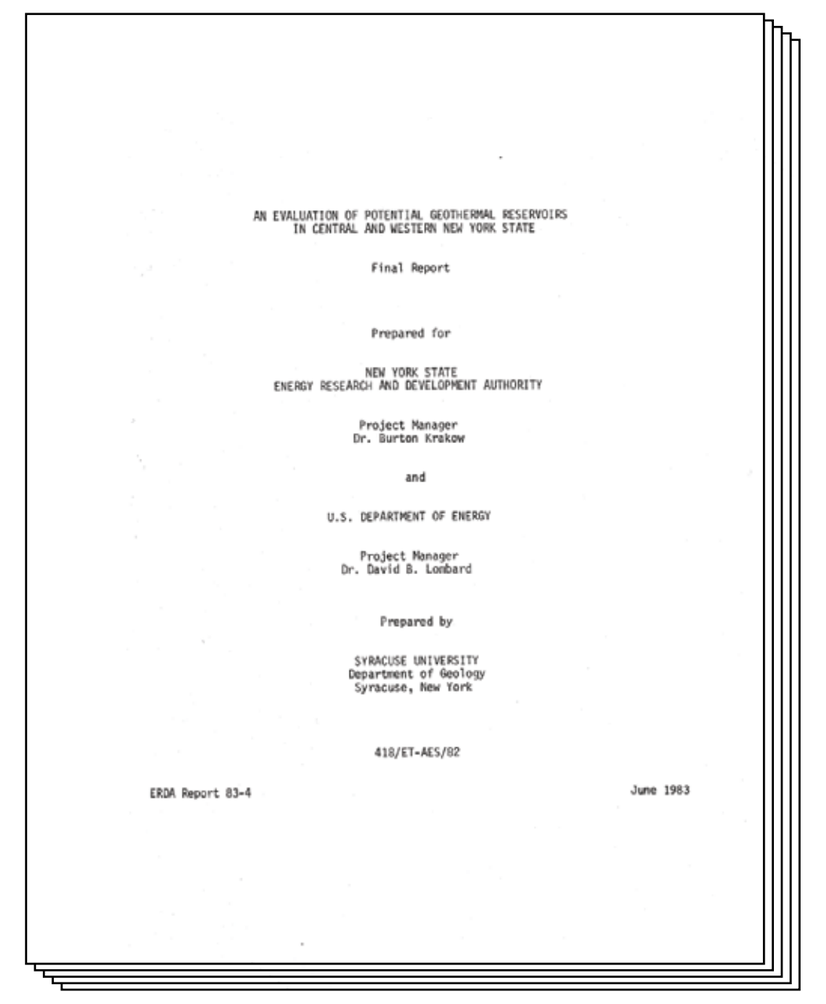
The ESOGIS **Well Search** tool allows users to query the database for wells using over 40 different criteria including:

- Identification information (name, type, status, API#)
- Locations (county, town, quadrangle, coordinates)
- Dates (permit date, spud date, completion date)
- Depths (elevation, total depth, measured depth)
- Formations (deepest, producing)
- File availability (logs, permits, production data)

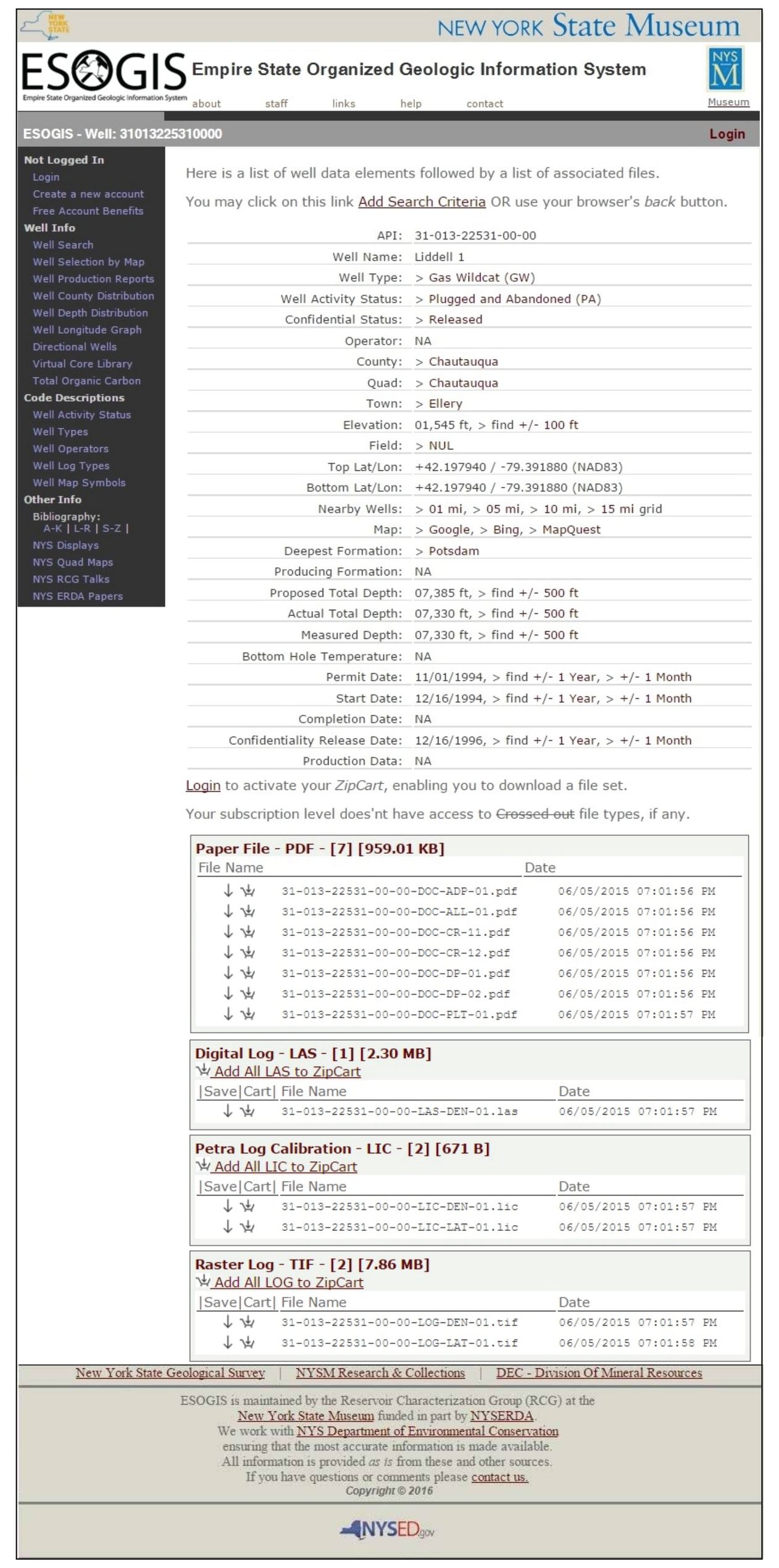
ESOGIS was originally created as a database for oil & gas well data, and although the majority of its content continues to come from deep well drilling operations, the New York State Museum is focused on adding material related to the other aspects of geologic research and collections from the museum. This includes inventories of collections, images of core (virtual core library), published reports from NYSERDA, posters and talks from conference presentations, and laboratory data such as total organic carbon (TOC) measurements.

Image of NYSTA Tandem Lot well core available in the virtual core library

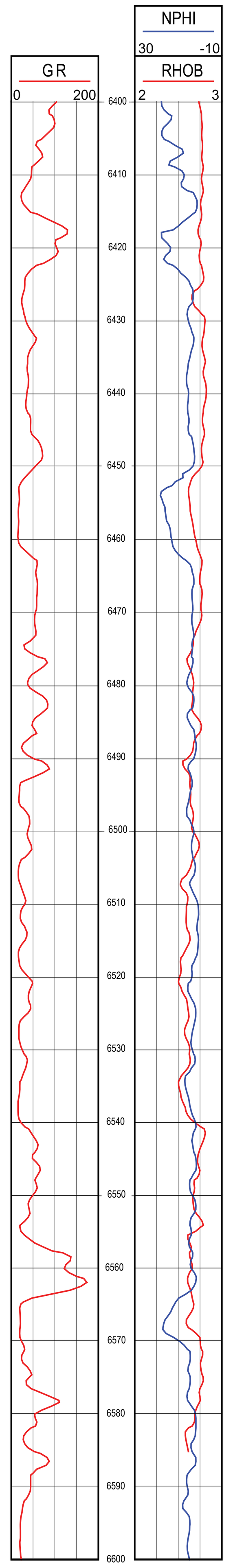
A PDF copy of a presentation given at the AAPG Eastern Section Covention in 2012



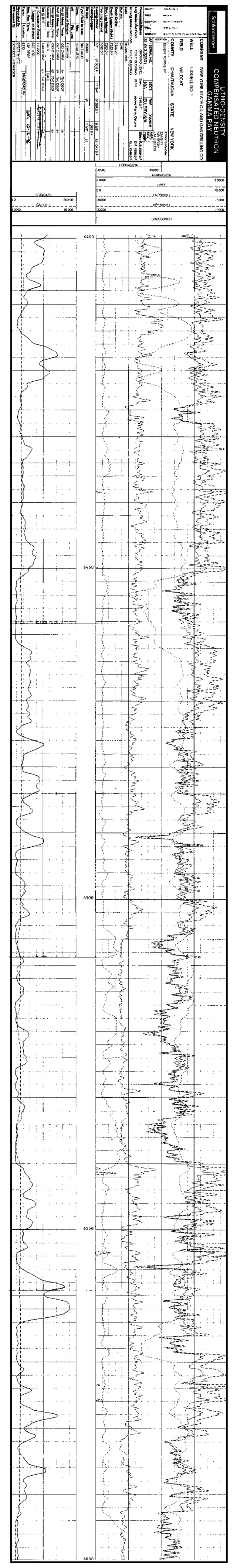
A PDF copy of a 1983 NYSERDA Report on Geothermal Resources in Central New York



Well Page for the Liddell #1 (API# 31-013-22531-00-00) with general data, formation tops, and a list of all available files.



Digital LAS file



Scanned TIF file