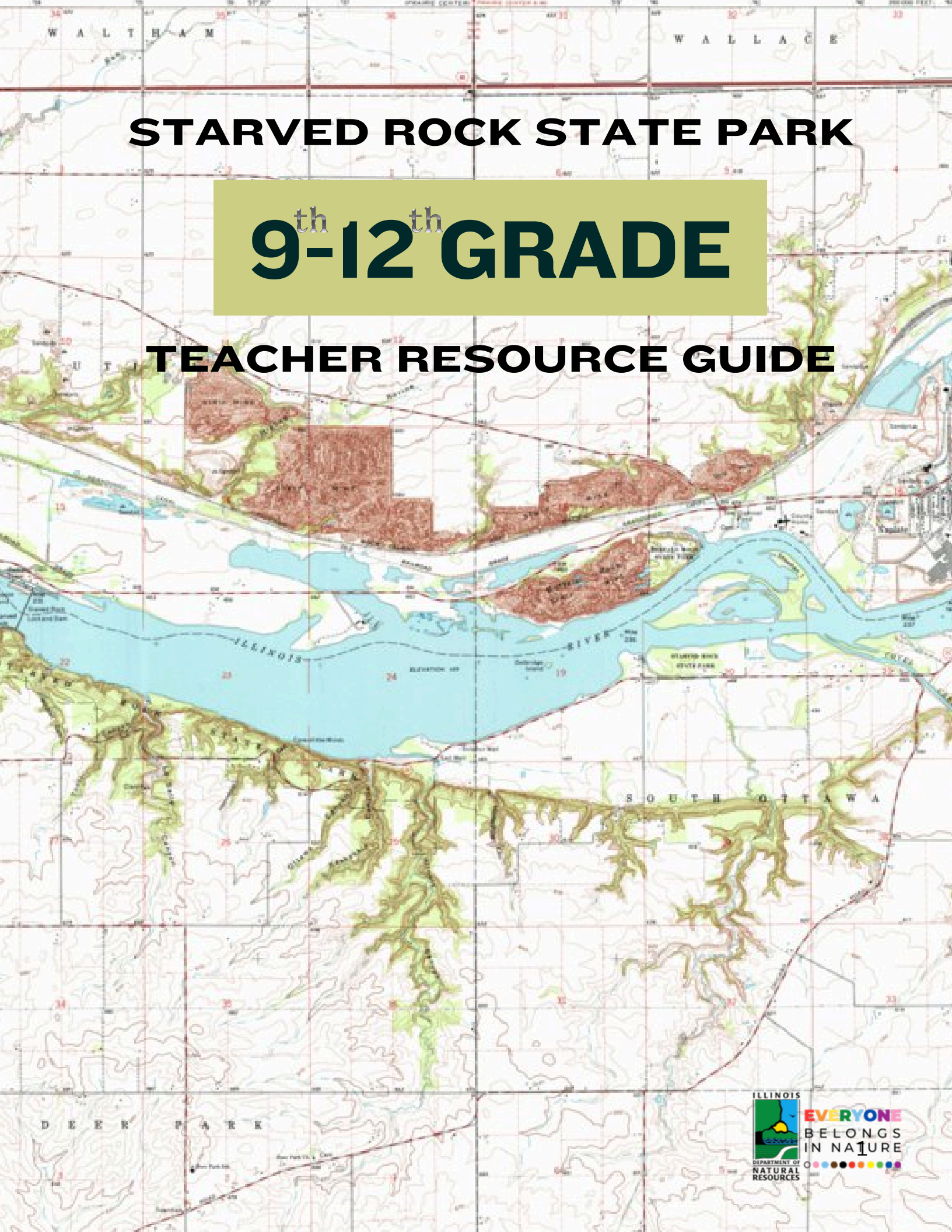
STARVED ROCK STATE PARK

9th-12th GRADE

TEACHER RESOURCE GUIDE



ILLINOIS DEPARTMENT OF NATURAL RESOURCES

EVERYONE BELONGS IN NATURE

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Steps for a Successful Field Trip!

1. **Complete an Activity Permit**
   dnr.illinois.gov/parks/interpret/park.starvedrock.html
   Required from all groups of 20 or more people.

2. **Acquire Proof of Liability Insurance from School/Organization**
   or Complete Release of Liability Form.
   dnr.illinois.gov/parks/interpret/park.starvedrock.html
   Required from all groups of 20 or more people.

3. **Complete Program Request Form**
   dnr.illinois.gov/parks/interpret/park.starvedrock.html
   Only when asking for an interpretive/educational hike from park staff.

4. **Review the IDNR-Starved Rock Webpage**
   dnr.illinois.gov/parks/interpret/park.starvedrock.html
   View trail suggestions, park history videos, maps, hours, rules and regulations.

5. **Prepare for a safe and successful day**
   at the park for all by reminding students and parents to:
   Dress for the weather, wear proper trail footwear, eat a good breakfast, and bring a bottle of water.

6. **Review IDNR Kids for Education Webpage and Reserve an IDNR Resource Trunk**
   dnr.illinois.gov/education/atoz.html
   Review website to view trunk materials and who to contact to reserve a trunk near your location.

7. **Utilize the worksheets and tips included in the following Teacher Resource Packet**
   Pre-visit, visit, or even post visit!

8. **Stop in at the Starved Rock Visitor Center:**
   Check out the amazing exhibits and displays about the park or request one of the 15 minute films on the park such as “In the Shadow of the Rock.”

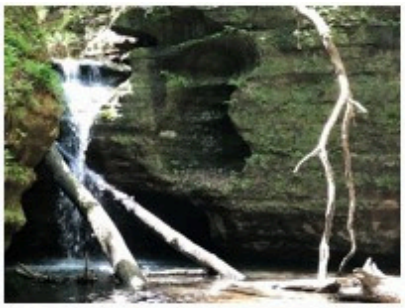
Written by
Natural Resources Coordinator Lisa Sons, and
Conservation Education Representative (2023-2025) Madeline Piller.

Park Highlights and Information

Starved Rock State Park is known for it's sandstone canyons and cliffs along the Illinois River in North Central Illinois. Thirteen miles of hiking trails take visitors in and out of 8 canyons such as Illinois, Ottawa, Kaskaskia, LaSalle, Wildcat, French, Aurora, and St. Louis canyons and 7 overlooks like Eagle Cliff, Lovers Leap, Beehive, Sandstone Point, Starved Rock, and Hennepin Canyon overlooks. Visit the IDNR website to download trail maps and individual trail suggestions for your class visit to the park at https://dnr.illinois.gov/park/parks.starvedrock.html.

Starved Rock

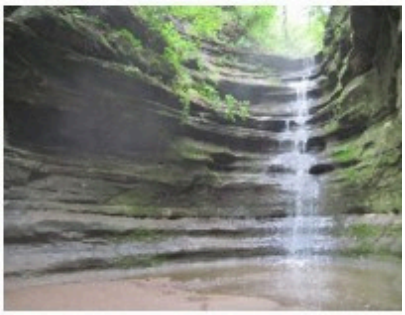
Ottawa Canyon



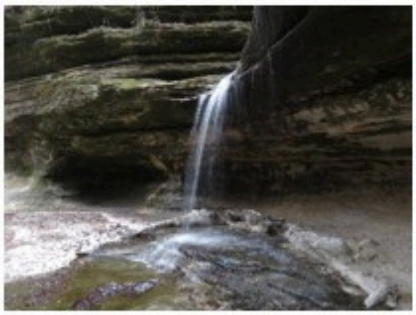
Kaskaskia Canyon

Lovers Leap

Eagle Cliff Overlook

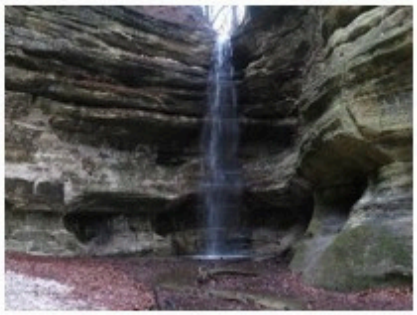


French Canyon



LaSalle Canyon

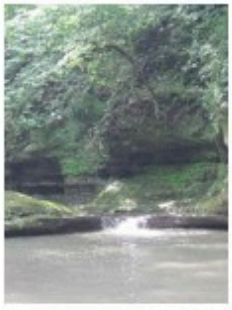
Tonti Canyon



St. Louis Canyon

Aurora Canyon

Wildcat Canyon



Illinois Canyon

Geology

Pre-Visit

- Discuss the vocabulary list.
- Watch video series:
  - **How Does Radiometric Dating Work?**
    - https://www.youtube.com/watch?v=oe45GegJUvM
  - **4 Ways to Date an Archaeological Site**
    - https://www.youtube.com/watch?v=NFNPmRWDBag
  - **How Glass is Made**
    - https://www.youtube.com/watch?v=DIKl7hQOD48
  - **Let's Talk All About Fluorite**
    - https://www.youtube.com/watch?v=TfGDrFDlXnA
  - **Mineral Identification**
    - https://www.youtube.com/watch?v=STbhZ6v19Y4

Visit

- Plan a hike into at least one of the 8 canyons along the Starved Rock State Park trail system where the geological processes can be seen in the sandstone canyon walls.
- Closest to the Visitor Center and main parking lot: French Canyon and Wildcat Canyon.
- Other parking lots that can accommodate a school bus: St. Louis Canyon, Matthiessen State Park
- Request the movie "In the Shadow of the Rock" at the Starved Rock Visitor Center.
- Go on a guided hike with one of the park's seasonal naturalists in the fall or the full-time Natural Resource Coordinator in the winter and spring.

Vocabulary

The following vocabulary words are a list of relevant terms. Highlight the words that you find in the reading, then use a reference to define the rest of the terms.

Exploited Extracted Refining Fluorite Resource Commodity Economic feasibility Reserve Ore Resource development	Explorations Extraction Refining Cement Chert Clay Fluorite Silica (industrial) sand Building Stone Limestone Inclusions	Eon Era Period Epoch Age Erathem Peat System Series Stage Lithologic Units	Surficial Geology Map Bedrock Geology Map Relative dating The Law of Superposition The Principle of Original Horizontality The Principle of Cross Cutting Relationships Unconformities Absolute Dating Half – life

Visit Activity

Geology Photo Scavenger Hunt

Take a photo of:

- A Canyon Wall
- Canyon Wall Graffiti
- An overlook showing the distance to the river
- Sand along the trail
- A warning sign about falling risk
- A sign detailing what is illegal in the park

Geology Reading

Geologic Columns and Maps
&Geologic Resource Management

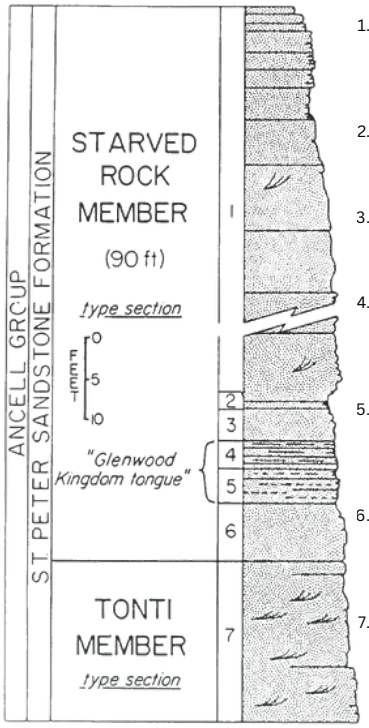
Geologic Columns

Large rocks or rock groupings are called “lithologic units”. Lithologic Units (largest to smallest are: group, formation, member) are defined based on a detailed description of a rock layer including rock type (igneous, sedimentary, metamorphic), rock name (granite, limestone, sandstone, gneiss, etc.), specific mineral composition, color, mineral grain size, fossils, contact with adjacent layers, and any other characteristics useful in identifying the unit.

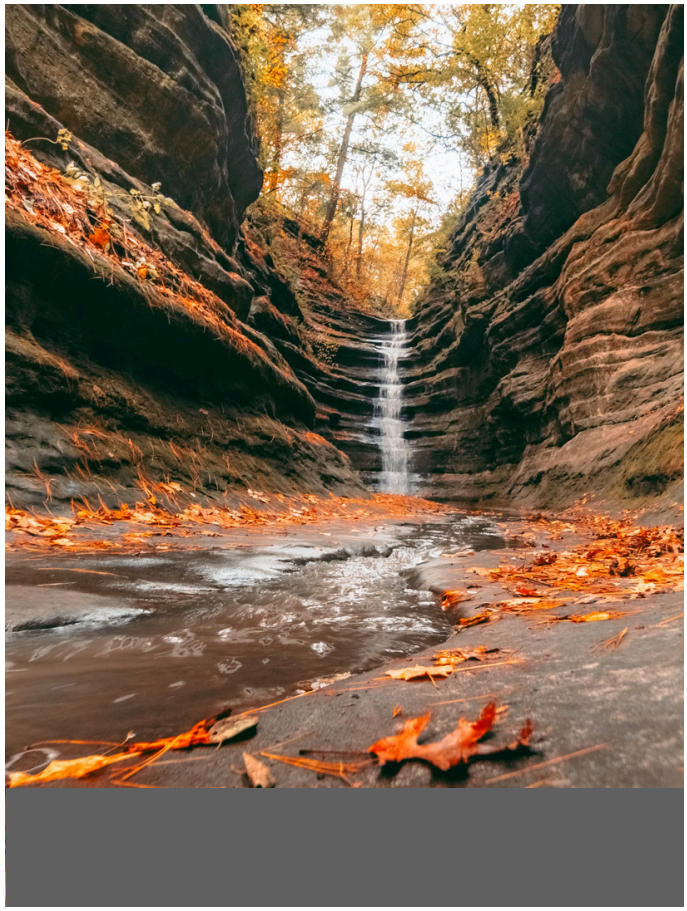
The formation is the primary lithologic unit and usually represents a single environment of formation. A formation is defined at a type location where it is well exposed and displays most, if not all, of its distinctive characteristics.

A formation is given a name based on a geographic feature near its type location. The second part of the formation name is a rock type if that type dominates the unit, or the word “Formation” if the unit is made of several rock types, none of which are dominant.

For example, the St. Peter Sandstone is a sandstone with its type location near St. Peter, Minnesota; while the Carbondale Formation is made of a variety of sedimentary rocks and has its type location near Carbondale, Illinois. Larger units (called groups) are named when several similar formations are placed together, and smaller units (called members) are named when a single formation is subdivided. Geologic columns are graphical representations of the lithologic units found in an area.



1. Sandstone-light brown to white consists of medium-size well rounded quartz grains.
2. Sandstone-white, silty, consists of fine well-rounded quartz grains.
3. Sandstone-gray, consists of medium size quartz grains well-sorted.
4. Sandstone-light brown to white consisting of both fine and coarse well-rounded quartz grains.
5. Sandstone-light brown to white consists of well-rounded very fine to medium quartz grains with silty streaks.
6. Sandstone -light brown to white consists of medium well-rounded quartz grains.
7. Sandstone-light brown to white consists of fine well-rounded quartz grains, commonly cross bedded with base concealed below water.



French Canyon *Photo Credit: Matthew Klein*

Geologic Maps

Geologic maps show the distribution of geologic units that are present at or near the surface. A geologic map is developed by a geologist who examines rock outcrops and well logs, records the rock units observed, and interprets the rock units present between the observed locations. A surficial geology map shows the materials pre- sent immediately underfoot and may display only the stratigraphic units of the Quaternary Period (the most recent period on the geologic time scale).

The image to the right is a surficial geologic map that shows the starved rock area. Note the river and canyons and their formations. *These images are taken from the Illinois State Geological Survey, a full pdf can be found at https://chf.isgs.illinois.edu/maps/quad/starved-rock-sg-edmap.pdf*

Surficial geologic map of Starved Rock State Park.

Geologic maps show the distribution of geologic units that are present at or near the surface. A geologic map is developed by a geologist who examines rock outcrops and well logs, records the rock units observed, and interprets the rock units present between the observed locations. The interpretation stage requires a great deal of knowledge and experience, and the resulting map is part science, part art. The interpretation can be checked by drilling wells to collect samples.

What are the methods of dating these rocks? How can we be sure that our dates are as correct as possible?

We employ two methods of checking our work when it comes to knowing how old different rocks and rock layers are:

Relative and Absolute Dating

Relative dating is accomplished using a set of logical rules that allow events to be placed in their proper order based on the relationships of the rock units. As illustrated on the previous page, the rules are easy to apply and require very little special knowledge. The primary rules are:

The Law of Superposition: When examining a sequence of undeformed sedimentary rock units, the oldest unit is on the bottom. This can become complicated when the rock layers have been overturned, so a geologist must be aware of this possibility.

The Principle of Original Horizontality: Layers of sediments are deposited in a horizontal position. The implication of this principle is that if sedimentary layers are found tilted or folded, something must have happened to them to cause the deformation

The Principle of Cross-Cutting Relationships: When a rock unit such as an igneous intrusion or a geologic feature such as when a fault cuts across another, the one that cuts across is younger.

Absolute dating determines the age of a rock. Radiometric dating is the primary technique used for absolute dating. Radioactive isotopes are forms of chemical elements whose nuclei spontaneously decay. This decay can occur through the loss or gain of particles. The key aspect of the decay process of interest to historical geologists is that it occurs at a constant rate called a half-life. A half-life is the time it takes for half of the original "parent" material to decay into "daughter" material. In a rock, the "clock" starts when a mineral crystal containing a radioactive isotope forms, the parent and daughter are both trapped inside the crystal. The half-lives that have passed is determined by opening the crystal, counting the amount of parent and daughter material, and comparing the counts to a graph showing how the decay process proceeds.

There are two primary limitations to radiometric dating:

1. The length of the half-life sets a maximum and a minimum to the age of the material that can be analyzed accurately. If not enough time has passed, there won't be enough daughter material to detect (to date a rock using rubidium-strontium, it must be at least 100 million years old). If too much time has passed, there won't be enough parent material to detect (to date a rock using carbon-nitrogen, it must be less than 70,000 years old). Newer, more sensitive equipment is helping remedy this problem.
2. Only certain materials can be dated. The rock or other material to be dated must contain the radioactive isotope. For example, carbon 14 is found in dead organisms and only certain rocks and minerals contain the other isotopes. In addition, the date gives the time the mineral crystallized, so many sedimentary rocks, which contain crystals were originally in other rocks cannot be dated. Most dating gives the time an igneous rock crystallized from molten material or the time when a metamorphic rock was recrystallized from a preexisting rock. When combined with relative dating techniques, the approximate ages of most rocks can be determined.

St. Peter Sandstone overlain by Colchester Coal and Wedron till, (NW1/4, SE1/4, SE1/4, Sec.10, T33N, R2E).

Once the lithologic units have been described and mapped, the geologic history of an area can be interpreted. The underlying rule of interpreting geologic history is "the present is the key to the past," also called uniformitarianism or actualism. The idea behind this rule is that natural processes operating today were also operating in the past in the same way (although the scale and importance of various geologic processes may vary). This means that geologists can study processes that created ancient rocks by observing the processes that create those rocks today. In addition, physicists must assume that physical processes, such as radioactivity, operate today in the same manner as in the past. Scientists extend this idea of uniformitarianism by saying that "the past is the key to the future."

The idea is to forecast what might happen in the future, based on the assumption that natural processes will continue to behave in a similar manner. This extends the importance of historical geology from interpreting the past to understanding what the Earth might be like in the future. For example, the rocks tell geologists that the Earth was warmer in the past. Understanding why the Earth was warmer and the impact that had on life allows geologists, climatologists, and biologists to describe the probable causes and effects of global warming. Historical geology may be divided into three parts: Relative dating puts the rocks in their proper order from oldest to youngest. Absolute dating determines the actual age of the rocks. Geologic interpretation develops an explanation of the environment in which the rocks formed. Together, these three techniques allow geologists to present a story of the Earth's history.

This mapping is also relevant to applied sciences, such as mining, and oil drilling. We can predict where oil and coal may be based on these maps and subsequent confirmation via sampling.

Starved Rock and its Natural Resources

Starved Rock is now a protected park, but its canyons and rocks have value outside of their natural beauty and always have. The rocks we see at the park are both beautiful and potentially valuable. How do we decide what areas have what value? We decide what areas should be conserved and which should be utilized economically for many reasons, and the monetary value of parts of the earth is always in flux. This geology section is meant to give you a profile of Illinois and Starved Rock geological resources and history and give you information to enhance your appreciation of the park.

Geologic resources are natural substances found in or on the Earth that have accrued monetary value due to their usefulness. Geologic resources are considered non-renewable because they are extracted faster than natural processes replace them. As humans mine each resource, they can expect to have removed all of it at some time in the near or distant future. If the resource is consumed by use, such as gasoline and coal, it is gone forever. However, if it is not consumed by use, such as glass, metal, and plastic, it can be recycled and used again, preserving the in-ground re- source. Development of a resource for human use can have a great impact on the Earth. The impact can be placed in three categories: Exploration for geologic resources usually has a relatively small impact. Drill holes and roads are the primary impacts. Extraction usually has a large impact. Strip/open-pit mining is especially destructive because the land surface is completely disrupted. Underground mining and pumping have less impact, but often, as the resource is removed, the loss of support for the overlying rocks results in subsidence (sinking) of the ground surface. Refining is usually somewhere in between extraction and exploration. In the past, refining operations caused a lot of pollution because the waste materials were dumped nearby or went into the atmosphere.

Modern refining operations are much more efficient and produce less waste, much of which is returned to the mine. In order to reduce these impacts, companies (in the U.S.) are required to return the land to as close to its natural state as possible. Exploration companies have to remove roads and plug wells. Mining companies must fill their holes (if possible), re-grade the landscape, and replace the topsoil. When reclamation is well done, it can be difficult to determine where the mine was located. In the U.S. and much of the world, mining activities are overseen by agencies that require permits, oversee activities, and ensure proper closure when the mining is complete.

Starved Rock is surrounded by silica mines. It once was looked at as a possible mining location because it is comprised of a valuable type of stone known as “St. Peter Sandstone.” Should we protect this sandstone in the park, or should it be used to benefit the economy because of its geological value? These are important questions to think about.

Illinois has many geologic resources. The resources are typically divided into two categories; energy resources such as coal, petroleum, and natural gas and non-energy resources, which include construction, industrial, and metal resources. This section will discuss some of the more important resources of Illinois both past and pre-sent. Native Americans were the first humans to use the geologic resources of Illinois. When the first European settlers arrived, they began to take advantage of the same resources. Over time, more resources have been utilized.

Silica (industrial) sand (St. Peter Sandstone) is a very pure quartz sand. The sand is a poorly cemented sedimentary rock that formed in a beach environment over 450 million years ago. Waves working the sand rounded the grains and removed most of the impurities. Silica sand is used to make glass, for polishing and sand blasting, to make foundry molds in which to pour molten metal, to filter water, and to hold open pore spaces and fractures near oil wells. Silica sand is also mixed into pottery clay, porcelain, plaster, and mortar. Silica sand is mined in North Central Illinois in LaSalle and Lee Counties. Illinois is the top producer of silica sand in the United States. This is the sand that comprises Starved Rock State Park.

Post Visit

The following activities are meant to be performed on school grounds and not at the state park.

Making Sandstone

We will begin by creating our own sample of sandstone, both to learn the process by which the sandstone canyons of Starved Rock stay together and to use our created sandstone to practice use of soil tests and hardness tests. This lab has been adapted by the Society for Mining, metallurgy, and Exploration Inc.

To create your own sandstone, you will need small paper cups, water, Epsom salt, and sand.

1. Mix a solution of 2 parts water with 1 part Epsom salt. This is your cementing solution which keeps your sandstone together.
2. Fill a paper cup halfway with sand, and pack the sand tightly into the bottom of the cup
3. Slowly, without disturbing the grains, add cementing solution to the cup until the sand is wet throughout.
4. Allow the mixture to dry completely in a warm place
5. When the sand has firmed, carefully tear the paper cup away from your newly cemented sandstone!

How does the cementing solution naturally occur (like in the bluffs at Starved Rock)?
When sediments are packed together in layers, water carrying minerals seeps between the layers and sediments and the evaporates. When this occurs, the minerals act like a cement to glue the particles together to create a larger rock.

What minerals act as cement to bind the sandstone in Starved Rock State Park?
In nature, crushed lime, alumna, iron oxide, and gypsum can act to bind the stone. These are naturally occurring minerals and are the recipe for the cement that you see utilized in building projects.

As you have read from the section regarding Illinois' geologic resources, sand is an important economic resource as well as a natural resource preserved for its beauty as sandstone. The ground beneath us here in Illinois is comprised of many different materials which require understanding to work with. For this section, we will be introducing three activities meant to familiarize you with what lies in the ground.

How much sand is in my soil?

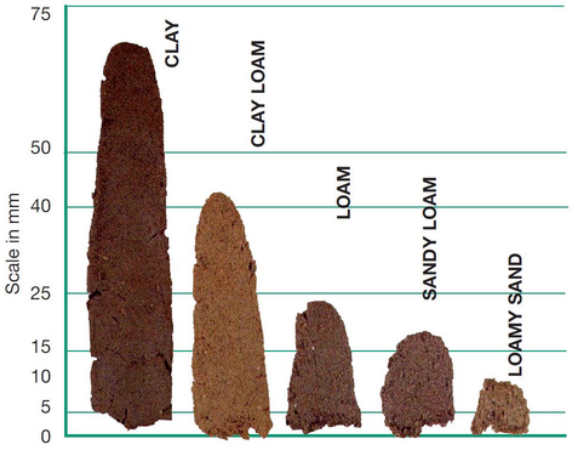
There are **3 main soil types**, and subtypes are created by mixing these 3 main types in varying percentages. The soil types can be identified by their texture.

Clay - Sticky texture which holds its shape, but has poor drainage
Sand - Has a gritty texture, but has low nutrients
Silt - Smooth and slippery, very fine, holds shape, but not to the degree of clay
Loam - Loam is a blend of the three soil textures, it holds its shape, but crumbles when lightly agitated.

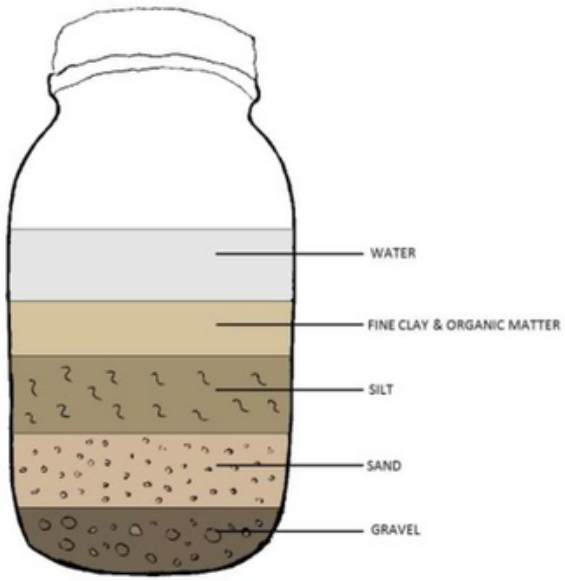
Field Tests

1. Collect and moisten soil samples: dig several inches into your sample area and wash hands after your collection and sampling.
2. Label your soil samples (A, B, C) and include the location of the soil sample on the label

The Ribbon Test
Roll your sample into a cylinder, then flatten the cylinder into a ribbon and let gravity stretch the soil ribbon. The longer the ribbon of stretch you can make with the soil, the more clay filled the soil. Check your ball test results with the ribbon test.



The Ball Test
Using your slightly moist samples form a ball of each soil sample in your hand. If your soil sample holds together when you open your hand, it has more clay. If the soil falls apart, it has more sand. Rank your soil samples from least clay to most clay.



Jar Test
1. Place your soil samples into jars, filling the jars approx. 1/3 full.
2. Fill the jar almost completely with water.
3. Add a teaspoon of dish soap to each jar
4. Cover and shake each jar thoroughly, until fully mixed
5. Place the jars next to each other on an even surface.
6. Allow jars to settle for 24-48 hours

Interpretation:
By now, you should see distinct layers in your jar. Place your soil samples next to each other to compare. The bottom layer will be comprised of sand. The layer above is your silt layer, and the top layer is clay. You can use a ruler to measure the heigh of each layer to give you quantitative data for comparisons.

Compare your samples to your previous data—did you predict the soil that has the most clay based on your color test and your field tests? Did the tests help to confirm the characteristics of your soil (for example, was your soil with the most clay the most red/yellow)?

An extension of this activity would be to predict the area and drainage behavior of a mystery sample based on performing these tests.

Ecology

Pre-Visit

- Discuss the vocabulary list.
- Watch educational videos:
  - Rivers of Illinois
    - https://www.youtube.com/watch?v=wRM4duL8u4M
  - Invasive Species
    - https://www.youtube.com/watch?v=K0jLPzqB3qo
  - IDNR's Launch of the Copi Initiative
    - https://www.youtube.com/watch?v=HTpoNvbOTgQ

Visit

- Plan a hike to Starved Rock or Matthiessen State Park.
  - Tallgrass prairie can be viewed at the south entrance of the park.
  - The oak-hickory forest can be experienced along any trail at Starved Rock State Park or Matthiessen State Park. The best trails to experience the forest are the brown bluff trails at Starved Rock State Park.
  - Wetland habitats can be seen at Matthiessen Lake at Matthiessen State Park or the sea wall area from the boat ramp down to Lone Point Shelter at Starved Rock State Park along the Illinois River.
- Request the movie "On the Wings of the Wind" about bald eagles at Starved Rock State Park.
- Go on a guided hike with one of the park's seasonal naturalists in the fall or full-time Natural Resource Coordinator in the winter and spring.

IDNR Resource Trunks:
The IDNR provides educational resource trunks to borrow or utilize that the park. To see the full list of the trunks, their locations of availability, and trunk contents, visit https://dnr.illinois.gov/education.html

Citizen Science Apps:
The University of Illinois Extension and IDNR connect with several apps and websites that allow everyday people to help collect scientific data. There are many apps and websites available, so don't forget to browse your local choices as well!

- "Bee Spotter"
- "iNaturalist"
- "Project Squirrel"
- "eBird" (Cornell Lab of Ornithology)
- "FrogWatch USA" (American Association of Zoos and Aquariums.)
- "Monarch Watch"
- "Merlin" (Cornell Lab of Ornithology) bird identification.

Vocabulary
The following vocabulary words are a list of relevant terms. Highlight the words that you find in the reading, then use a reference to define the rest of the terms.

Invasive Species	Illinois Invasive Species -awareness month	Thousand Cankers Disease	Infrastructure
Pathogens	Ranavirus	Swine	Physiographic
Taxa	Snake Fungal Disease	Mechanism	Watersheds
Indirect impacts	White nose syndrome	Cascading effect	Curtail
Key invasive species	Viral Hemorrhagic Septicemia	Benthic	Mitigating
SGCN	Hemorrhage	Feral	Forage
Exotic Species	Herpetofauna	Protists	Nuisance
Exotic Plant Strike Team	Injurious Species	Fecundity	Corps of Engineers
Illinois Invasive Plant Species Council	Propagate	Causal agent	Electric barrier
Point of origin	Suppression tools	Exacerbated	OWR
		Benign	Propagule pressure
			Biological control efforts

Ecology Reading

Invasive Species Campaign - *Sourced from the IDNR 2015 Campaign*
Copi Case Study - *Sourced from the IDNR 2015 Campaign*

Invasive species are defined as non-native organisms whose introduction cause or are likely to cause environmental harm. Worldwide and within Illinois, invasive species are a primary threat to native species of wildlife, the integrity of natural communities, and the quality of habitats. Invasive species are a leading cause of extinctions worldwide, and, in Illinois, are a contributing factor to the listing of a majority of the Species of Greatest Conservation Need (SGCN).

- Lists of wildlife species that require further conservation, as determined by States, the District of Columbia, and U.S. Territories in their wildlife action plans, are compiled in the Species of Greatest Conservation Need (SGCN) National Database. As they created the SGCN National Database, USGS staff verified scientific names from wildlife action plans with taxonomic authority to improve consistency in scientific names and allow for data collection and summarization. Information from the SGCN National Database supports teamwork and coordination of conservation initiatives at state, regional, and national levels.

In Illinois, invasive species can come from all groups of organisms, including plants, invertebrate animals, vertebrate animals, and pathogens. Current examples of invasive species that are impacting the state include exotic bush honeysuckles (Lonicera maackii, L. morrowii, and L. tatarica), Silver Carp and Big Head Carp (Hypophthalmichthys molitrix and H. nobilis), and Emerald Ash Borer (Agrilus planipennis).

The actions included within this campaign section are provided to help guide the next 10 years of implementation. While other actions may be needed and larger goals could be set, the campaign prioritizes the actions contained in this section as realistic, achievable and most needed within the next 10 years to best aid in meeting the overarching goals of the Wildlife Action Plan to:

1. Establish desired number and distribution of viable populations for each SGCN and target Focal Species by 2015.
2. Manage habitats through promoting self-maintaining natural-disturbance regimes for the benefit of native species.
3. Develop resiliency and connectedness into habitats so species can adjust to landscape and environmental changes.
4. Foster an awareness, appreciation, and connection to SGCN and associated habitats among the public.

Goals
Managing current and preventing new introductions of invasive species will aid in reducing the direct and indirect impacts these organisms have on our Species of Greatest Conservation Need. Invasive species alter the health of habitats in Illinois, directly impacting that habitat's resiliency and ability to adjust to landscape and environmental changes. The actions in this campaign were designed to reduce or remove stressors that limit the population size, range, and health of our SGCN as well as improve habitats that benefit the native species of Illinois.

Objectives for the invasive species campaign are as follows:

- Establish a thorough, unified strategy for tackling invasive species that transcends jurisdictional, organizational, and agency lines.
- Recognize critical invasive species and scenarios affecting SGCN and their habitats and implement measures to mitigate or eliminate these adverse impacts.
- Detect invasive species that could threaten SGCN in the future and stop their entry or spread in Illinois.
- Preserve and restore the health of SGCN populations to lower the chances of contracting and suffering from exotic diseases and pathogens.
- Create strong policies, protocols, and regulations in Illinois to manage the introduction, use, and transport of invasive species.
- Raise awareness about invasive species in Illinois and promote the development of the knowledge, skills, and abilities needed for effective management, especially on private properties.

Status as of 2015

Invasive species continue to expand throughout the state. They remain a primary challenge to conserving and maintaining the rich biodiversity of Illinois. In particular the conservation of our rare wildlife species and the habitats they depend upon. Since the publication of the **Comprehensive Wildlife Conservation Plan & Strategy** (**CWCP; State of Illinois 2005**) many invasive species have expanded their range in Illinois. For example, previously confined largely to far southern Illinois, Japanese Stiltgrass (*Microstegium vimineum*) has experienced an explosive range expansion. As of 2015, Japanese Stiltgrass can be found in at least 26 counties, including several locations in far northern Illinois. Emerald Ash Borer (Agrilus planipennis) was first found in Illinois in 2006, but since has continued to expand its range. As of 2015, Emerald ash borer has been found in 310 communities and 50 counties. Teasel (Dipsacus sp.) while being present in Illinois for a long time, has continued to expand its range and can be found along almost any major transportation right-of-way in the state.

Since 2005, several exotic species that have become (or have the potential to become) invasive have been found in Illinois:

Plants: Japanese Chaff Flower, (*Achyranthes japonica*) (2008); Giant Hogweed, (*Heracleum mantegazzianum*) (2006); Smallflower Saltcedar, (*Tamarix Parviflora*) (2012); Hyssop Loosestrife, (*Lythrum hyssopifolium*) (2011); Parrotfeather Milfoil, (*Myriophyllum aquaticum*) (2008); Sacred lotus, (*Nelumbo nucifera*) (2012); and Reed Mannagrass, (*Glyceria maxima*) (2006).

Insects: Emerald Ash Borer, (*Agrilus planipennis*) (2006); Brown Marmorated stinkbug, (*Halyomorpha halys*) (2009); and Velvet Longhorn Beetle, (*Trichoferus campestris*) (2009).

Emerald Ash Borer. Photo forestyimages.org.


Velvet Longhorn Beetle. Photo entomology.net

Animals: Corbiculid Clam, (*Corbicula largillierti*) (2008); Mottled Fingernail Clam, *(Eupera cubensis*) (2006); Red Swamp Crayfish, *(Procambarus clarkii*) (2010); and Quagga Mussel, *(Dreissena rostriformis bugensis*) (2005).

Red Swamp Crayfish. Photo animalia_life.club

However, even with expanding populations of invasive species and continued introduction of new species, significant progress has been made since the CWCP (State of Illinois 2005) was written. Three cooperative weed management areas (CWMAs) have been established in Illinois. These local partnerships plan, prioritize, and coordinate invasive plant actions across agencies and organizations in a defined area. The two most well-established CWMAs in Illinois are the River-to-River Cooperative Weed Management Area in southern Illinois and the Northeast Illinois Invasive Plant Partnership in Northeastern Illinois. Additional CWMAs are being established in other regions of Illinois. Other local partnerships also collaboratively address invasive species. One example is the Clifftop Alliance in southwestern Illinois.

Exotic Plant Strike Teams are proving to be an effective means of controlling priority populations of invasive plants and to implement rapid response for new infestations. These teams also provide crucial data collection and mapping functions, which help inform priority-setting for their region and the entire state. As of 2015, Strike teams are functioning in southern, northwestern, and northeastern Illinois.

The Illinois Invasive Plant Species Council has been established and serves as the avenue for enhanced communication between land management agencies and the horticulture industry. This council has developed a strategic plan that corresponds with the Wildlife Action Plan's Invasive Species Campaign. Additionally, the council has developed and initiated a species assessment protocol to review and make recommendations for the regulation of plant species.

Illinois Invasive Species Awareness Month (ISAM) was established in 2010 to create a concerted, statewide effort to raise awareness about invasive species issues. Many local, state, and federal agencies and organizations participate in ISAM by hosting events and programs. Between 2010 and 2015, over 550 events have been held as part of ISAM. Starting in 2014, an annual Invasive Species Symposium has been held to highlight and update invasive species projects and initiatives in Illinois.

Illinois has ramped-up efforts on Silver and Bighead Carp (*Hypophthalmichthys molitrix and H. nobilis*) during the last ten years, including hiring new biologists that deal primarily with these efforts, reinforcing the electric barrier with the Chicago Area Waterway System and contracting commercial fishermen as means of preventing these fish from entering the Great Lakes watershed. The electronic barrier, which was installed in 2002, was upgraded and repaired in 2008 with additional barriers added in 2009 and 2011.

The 2006 discovery of Emerald Ash Borer *(Agrilus planipennis*) in Illinois has drastically changed the urban forests, urban forestry, and forest health in Illinois. The Illinois Department of Agriculture and USDA-APHIS lead an aggressive response that included quarantines, educational campaigns, new regulations, and grants to assist in removal and replanting.

Wildlife health continues to be an important aspect of wildlife management. Recent discoveries of exotic diseases (Ranavirus, Snake Fungal Disease, White-nose Syndrome, and Viral Hemorrhagic septicemia) have wide impacts on our native wildlife, including SGCN. The exotic Faucet Snail (*Bithynia tentaculat*), is invading the Mississippi River and has recently been found in the river adjacent to northern Illinois. This snail harbors pathogenic helminthes (*Cyathocotyle bushiensis* and *Sphaeridiotrema pseudoglobulus)*. These helminths, when consumed by waterfowl or other water birds, cause internal hemorrhaging and death.

Efforts have ramped up in terms of response to these issues, particularly with chronic wasting disease, CWD, in white-tailed deer and the exotic diseases impacting herpetofauna. Recent efforts to develop statewide wildlife health programs and wildlife disease response plans have started and are a promising advance of this important issue.

The public's familiarity with and knowledge about invasive species has increased dramatically since 2005, in large part due to the efforts outlined in the original Invasive Species Campaign. Currently Illinois citizens, in general, know about invasive species and understand that they can be a threat.

Stresses and Threats to Wildlife and Habitats

The mechanisms that are utilized by invasive species to impact native wildlife species and the scale of those impacts are extremely variable. In general, invasive species can act as stressors or threats to native wildlife species in three ways. Some invasive animal species directly compete for the same natural resources and life requirements (food, water, space, shelter) as native species. For example, the round goby (*Neogobius melanostomus*) has a well-developed sensory system that enhances its ability to detect water movement. This allows it to feed in complete darkness, giving it an advantage over native fish in the same habitat.

Invasive species can displace native plant communities and/or radically change the nature of the habitats they invade. Through their impacts on species and ecosystem processes, invasive species can result in the fragmentation, destruction, alteration or complete replacement of habitats which in turn, has cascading effects on even more species and ecosystem processes. Some examples of these impacts include the following: studies have demonstrated that songbirds often use exotic plants as nesting substrates and may suffer elevated predation rates relative to nests placed in native plants; common carp have a stronger influence on water quality and aquatic community structure than benthic fish native to Illinois; or the destructive feeding habits of feral swine (*Sus scrofa*), primarily rooting disturbance, can reduce plant cover, diversity, and regeneration. Invasive pathogenic microbes are introduced microorganisms which are usually single-celled, or too small for the unaided eye to see, including bacteria, viruses, protists, and fungi. Some pathogenic invasive species cause direct mortality to native wildlife or impact their health, or fecundity is such a way as to impact the overall population. Examples of this would be ranavirus decreasing survivorship and fecundity of eastern box turtles or increased mortality of eastern massasauga individuals due to snake fungal disease (causal agent (*Ophidiomyces ophidiicola*). When in combination with other stressors, such as climate change, fragmentation, and habitat loss, impacts from invasive species are often exacerbated.

Before any specific invasive species can impact native wildlife, it must first arrive to Illinois. Invasive species are introduced into Illinois via three major pathways:

1. **Intentional Introductions** – Some species of plants, animals, and microorganisms have been spread by humans over much wider ranges than they occupied naturally. Some of these introductions have and continue to be deliberate in Illinois. Most often this is the intention to improve conditions for some human activity such as benefiting agriculture, aquiculture, or other economic interests; improving wildlife habitat; purposes of sport fishing and hunting, horticultural escapes, pets, and erosion control. While most of the exotic species are benign, some of these introductions result in naturalization of species which are highly invasive. Examples of intentionally introduced species include kudzu vine (*Pueraria montana)* introduced for erosion control and as livestock forage, feral swine introduced for hunting opportunities, and multiflora rose (*Rosa multiflora*) introduced for agriculture and wildlife.

2.**Accidental introductions** - Other introductions are accidental, as when plants are introduced with soil; transported as ballast in ships; or insects were transported with timber or food. Illinois has structural features that increase its susceptibility to accidental invasions. Chicago for example, is the largest inland general cargo port in North America, and the city as a whole is one of the major transportation hubs of the nation.

International ports via air and water mean Illinois has been and should expect to continue to be a point-of-origin for biological invasions. These invasions can occur as a result of direct importation into Illinois from overseas, or indirectly, through domestic redistribution of species that have invaded other parts of the U.S. The state's massive transportation infrastructure facilitates the spread of established invasive species throughout the state. Examples of accidental introductions into Illinois include Asian longhorn beetle (*Anoplophora glabripennis*), which was directly introduced into Chicago through imported wood packing material, and the emerald ash borer *(Agrilus planipennis*), which originally invaded the state of Michigan through imported wood packing material and was then likely introduced into Illinois through domestic movement of firewood and/or other wood products.

3. **Natural spread from introductions in adjacent regions** – Illinois is a diverse state that touches four major physiographic regions (Central Lowland, Interior Low Plateau, Ozark Plateau, and Coastal Plain) and bridges two major watersheds (Great Lakes and Mississippi River). Illinois is bordered by two of the largest river systems in North America (Mississippi and Ohio Rivers). Because of these factors and Illinois' location within the United States, the state is at high risk of invasive species, spreading naturally from other regions of the country. Examples include Japanese stiltgrass (*Microstegium vimineum*) and Japanese chaff flower (*Achyranthes japonica*) likely made their way into Illinois by moving down the Ohio River; saltcedar (*Tamarix sp*.) down the Mississippi River, and white-nose syndrome (causal agent *Pseudogymnoascus destructans*) introduced via migrating bat species and because of people traveling from cave to cave and transporting the agent from location to another via their shoes.

Unfortunately, many of these methods of introduction are difficult to curtail, resulting in constant introductions of new species. Since the publication of the CWCP, at least 18 new invasive species have been discovered in Illinois. With the 'community' of invasive species in Illinois continually changing with new and often poorly understood invasive species being introduced each year, mitigating actions and priorities must also continually change through updates and reprioritization.

Local Case Study

Copi (Previously known as "Asian Carp")

COPI/Asian Carp. Photo fisheriesblog.com

Copi arrived in the United States in 1963 as part of an experiment to reduce nuisance vegetation without the use of poisons that might enter the food chain. Prior to the Clean Water Act, American rivers were often highly polluted and the bottom feeding varieties of carp excelled in sewage treatment lagoons.

Arkansas breeders flushed the carp into canals and waterways where they began to flourish and breed, gradually expanding into the Mississippi River with the assistance of seasonal floodwaters, and throughout the massive watershed of the river across 31 states. Awareness grew in the 1990's as the fish began to dominate the Illinois River and by 2002 the Corps of Engineers had finished construction of a demonstration electric barrier near Romeoville, Illinois. In 2008 the demonstration barrier underwent repairs, and the second, more powerful, electric barrier began construction not far downstream. Barrier IIA and IIB became live in 2009 and 2011. Another barrier was under construction in 2014.

The Chicago District, Corps of Engineers operates and maintains the barriers. Barrier I was authorized and constructed at full federal expense. Barrier IIA was initially authorized requiring a nonfederal sponsor and cost share. OWR contributed $1.8M. Barrier IIB was constructed at full federal expense, and operation and maintenance of the electric dispersal barrier project is also a full federal expense. In 2015, Congress identified Brandon Road Lock and Dam as the site for enhanced efforts to prevent the upstream transfer of aquatic invasive species. On May 4, 2018, the State of Illinois offered by letter to sponsor the US Army Corps of Engineers Asian Carp project near Joliet.

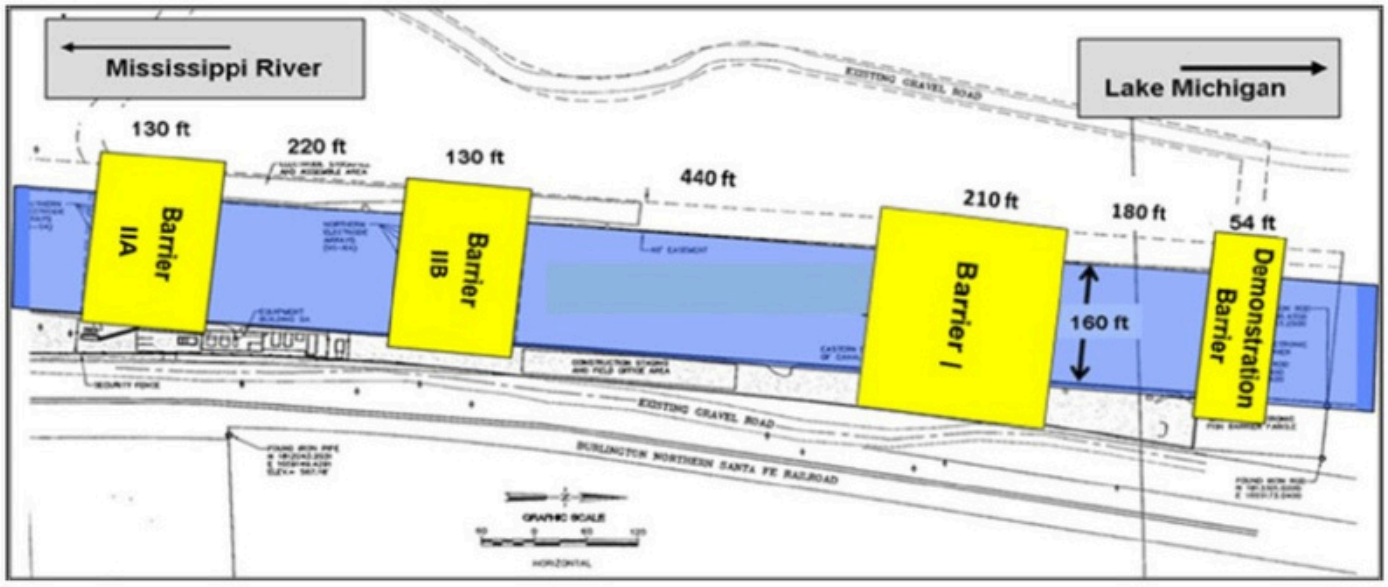
Chicago Sanitary and Ship Canal

DNA monitoring of the Chicago Sanitary and Ship Canal began in 2009 and found carp DNA beyond the last lock in place before the electric barriers and beyond the barriers as well. Advocates for closing the two navigational Chicago locks to Lake Michigan began calling for watershed separation and taking the lock issue to court.

During major rain events, these two locks are opened to allow storm water to flow into Lake Michigan rather than flood the city, however, no actual Asian Carp were found by fishermen or repeated fish kill efforts until one small Bighead Carp in December 2009. A second, adult, Bighead Carp was caught in a fishing net six miles from Lake Michigan in June 2010. Other DNA traces have been found above the barriers.

In early 2014, the Corps of Engineers, in consultation with other federal agencies, Native American tribes, state agencies, local governments and non-governmental organizations, released a study documenting potential watershed separation that would cost $18 billion and take decades to complete. A competing study commissioned by Great Lakes region Mayors and Governors concluded that the separation could be accomplished for $4.25 billion, in far less time. Both are on hold. Potential local sponsors could include IDNR and the MWRDGC.

A physical barrier was constructed in Indiana across one potential watershed separation site in 2016 at Eagle Marsh Nature Preserve near Fort Wayne, Indiana. Copi have been found in the Minnesota River, but dams at Prairie du Sac and St. Croix Falls would prevent further inroads.



The electric barrier system in the Chicago Sanitary Ship Canal (CSSC) near Lemont, Illinois where the CAWS connects to the Mississippi River basin. *Barrier 1 is under construction (USACE 2015).

Invasive Species Game

Round Goby

Objectives:
1. Students will understand that resources are limiting factors in an ecosystem.
2. Students will understand that each organism has adaptations that allow it to obtain resources.
3. Students will understand that invasive organisms can upset the balance of an ecosystem and out compete native species for available resources.

Context: This particular game involves the goby an invasive species in Lake Erie. This game can be modified to be any invasive species depending on your region and natural inhabitants. This game can be utilized when teaching about life cycles, pollution (pollution would reduce vital nutrients), invasive species, and aquatic life.

Equipment: Per five-person group:
- 5-cups
- 2-plastic knives
- 1-plastic spoon
- 3-plastic forks
- 1-large binder clip
- 10 red pom-poms
- 12 black pom-poms
- 10 white pom-poms
- 3x4 piece of felt
- 25 bingo chips
- 1 timer

Eating habits: Perch eats only white, walleye eats only white and red pom-poms, blue gill eats only black, bass eats black and red, gobies eat anything (using a binder clip) and are introduced after a few rounds so students can see how stable their ecosystems are before and after the goby.

Scoring: Each fish starts off with three lives represented by bingo chips. At the end of the round each fish needs 5 pom-poms to survive the round. For every 3 pom-poms beyond the first 5 the fish produces 1 offspring which counts as an extra life. e.g. after round one the perch has collected 9 pom-poms, the perch does not lose a life (bingo chip) this round since he found five. The perch also gets one additional life (bingo chip) because of his three additional pom-poms. The ninth pom-pom only serves to keep other fish from reproducing. Once the fish is out of lives, he becomes extinct and that player joins the goby player, collecting pom-poms with another binder clip.

Set-up:
There are four native species:
1. Perch: one with a plastic spoon
2. Bass: one with two knives in one hand
3. Blue Gill: one with one fork
4. Walleye: one with two forks in one hand.

It is important to note that tools can only be held in ONE hand. So holding the two knives will take the dexterity of operating chopsticks. If this is too difficult for students, make changes as necessary.

Instructions:
- Randomly distribute the pom-poms onto the felt.
- Each of the four native fish will have 30 seconds per round to collect food using one hand and assigned tools.
- The native fish will play 3 rounds before the invasive (goby) arrives.
- Play will continue with the goby now competing for resources for 3-5 more rounds.
- It should be made clear to the gobies that it is in their benefit to eliminate native species.
- Their tactics should include selective feeding to knock out other species, e.g., eating only white, so the species that can only eat white cannot get enough to reproduce.

Post-activity discussion questions:
- Were you able to compete with the other native species for resources necessary to your survival and reproduction?
- Were you able to compete with the invasive species for resources necessary to your survival and reproduction? Why? What made the goby so successful?
- What could be the consequences of organisms entering an ecosystem that have a competitive advantage over the native species?

History

Pre-Visit

- Discuss the vocabulary below.
- Watch educational videos:
  - Starved Rock Snapshot, The Illinois Confederation
    - https://youtu.be/FyFqU6dftSs
  - Starved Rock Snapshot, From Legend to Leisure
    - https://youtu.be/3n4HcWfa9rU
  - CCC Boys talk about the Civilian Conservation Corps
    - https://www.youtube.com/watchv=ZnksyfJzV5w&pp=ygUYY2l2aWwgY29uc2VydmF0aW9uIGNvcnBz
  - Starved Rock Snapshot, Civilian Conservation Corps
    - https://youtu.be/MLefuBao4ho
- Partake in the listed Pre and Post Visit Activities on preceding pages.

Visit

- Plan a hike to Starved Rock, the highest point of the park and the location of Fort St. Louis with views of the Illinois River and the site where the Grand Village of the Kaskaskia was once located. Interpretive panels on top of the rock are a great resource to visit with students.
- Request the following movies at the Starved Rock Visitor Center:
  - In the Shadow of the Rock
  - The Civilian Conservation Corps
- View the various displays and exhibits on the Park's history at the Starved Rock Visitor Center.
- Go on a guided hike with one of the park's seasonal naturalists in the fall or full-time Natural Resource Coordinator in the winter and spring.
  - Request the Illinois, Kaskaskia, and Peoria Interpretive Hike or
  - Civilian Conservation Corps at Starved Rock State Park

Reading

Timeline *of Starved Rock Area* - written by Mark Walczynski
The Indians of the Western Great Lakes-written by W.Vernon Kinietz
The Peorias, written by Dorris Valley and Mary M. Lembcke
An Ethno History of the Illinois Indian Tribe, written by Raymond Hauser
Massacre 1769: The Search for the Origin of the Legend of Starved Rock, written by Mark Walczynski
Hotel Plaza, written by Gail Schroeder Schnell
The Zimmerman Site, written by Margaret Kimball Brown
Protohistory at the Grand Village of the Kaskaskia, written by Robert F. Mazrim
The Civilian Conservation Corps: The History of the New Deal's Famous Program for Young Men by Charles River Editors
The Tree Army: A Pictorial History of the Civilian Conservation Corps, 1933-1942 by Stan Cohen
The African American Experience in the Civilian Conservation Corps by Olen Cole Jr.
With Picks, Shovels & Hope: The CCC and Its Legacy on the Colorado Plateau by Wayne K. Hinton
Hard Work and a Good Deal: The Civilian Conservation Corps in Minnesota by Barbara W. Sommer

Vocabulary

The following vocabulary words are a list of relevant terms. Highlight the words that you find in the reading, then use a reference to define the rest of the terms.

Algonquian Ancestor Assimilation Colonialism	Colony Commission Confederation Culture	Eradicate Genocide Identity Indian Adoption Program	Indian Child Welfare Act 1977 Indigenous Indoctrinate Native	Natural Resource Propaganda Reservation Subsistence Treaty	Tribe UNDRIP UNESCO Wigwam

Indigenous Timeline

Pre Paleoindian Period (19,000-13,000 years ago)
The Pre-Paleoindian Period refers to Native American occupations of the New World that date to the time before Paleoidian or Clovis. Although somewhat controversial, evidence is mounting that humans occupied the Americas earlier than previously thought.

Paleoindians (13,000-10,000 years ago)
The Paleoindian Period refers to the time period when people migrated to the North American continent. People during this period were nomadic hunter-gatherers who subsisted on foods obtained from the wilds, from foraging and hunting species that are not domesticated. Hunting-and-gathering peoples tend to live in social groups that consisted of between 20 to 60 people, were relatively non-hierarchical and politically egalitarian. Early evidence of these peoples includes “Clovis” points, which are long, fluted chipped stone projectile points.

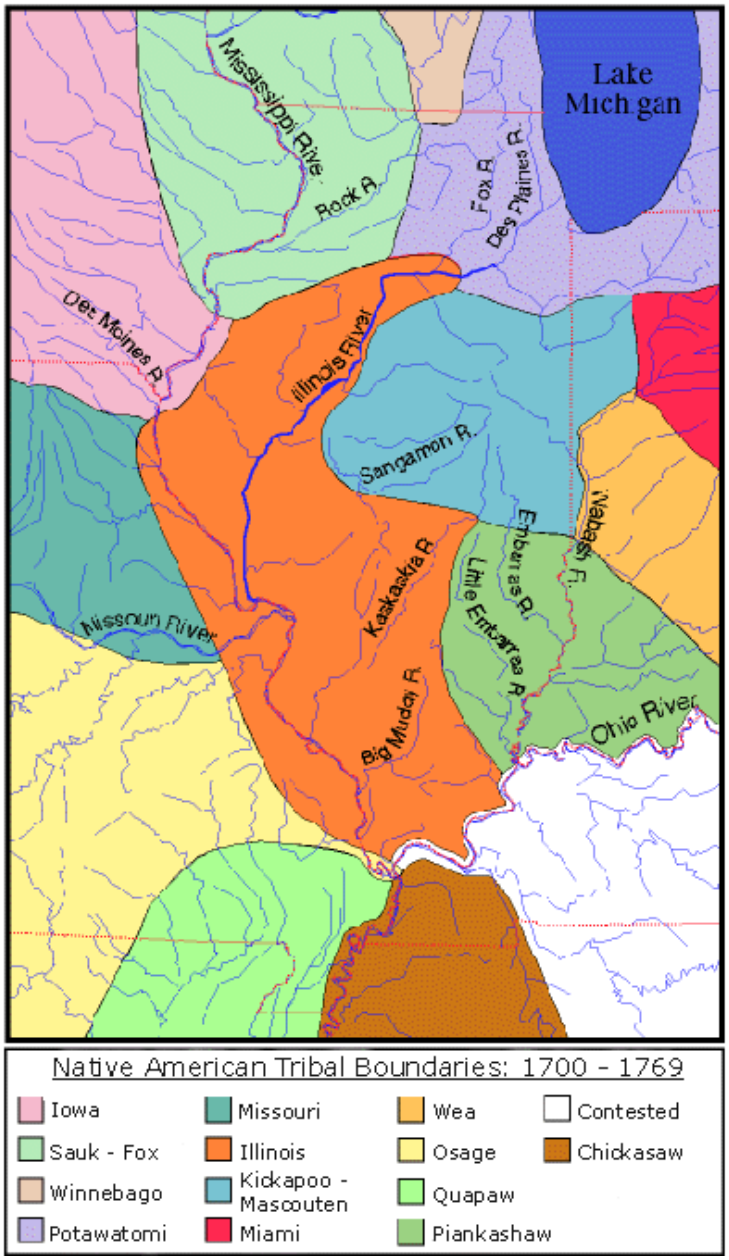
Archaic People (10,000 to 2,500 years ago)
The Archaic Period begins as the environments changed to resemble modern environments. This period is characterized as a mobile gathering-and-hunting life and a mostly egalitarian social organization. Important Archaic cultural developments included the use of notched and stemmed projectile points, the atlatl, containers of stone and pottery, and ground and polished stone artifacts. During this period, long-distance trade was established. By the end of the Archaic period, people were beginning to practice small-scale agriculture.

Woodland People (2,500 to 1,000 years ago)
The Woodland Period is characterized by increasing horticultural expertise, use of ceramics, and increasing sedentism and social complexity, when compared to the previous Archaic period. With the advent of agriculture, the once small family hunting groups had settled to a more sedentary existence, establishing farming villages (maize, squash, etc.). Sometime during the middle of the Woodland Period, known as the “Hopewell” period, maize from Mexico was introduced to the tribes of Illinois, as was the bow and arrow. To store and cook maize and other foods, Native Americans developed thick, grit tempered ceramics, or pottery. During this same time, widespread trade across large stretches of the continent (people from today’s Illinois traded with tribes from the Yellowstone area for obsidian, and shells from the Gulf of Mexico. Unfortunately, long distance trade also brought with it extended warfare and disease. Burial mounds of the Woodland people dot the hillsides along major rivers such as the Illinois River.

Mississippian People (1,000 to 500 years ago)
During the Mississippian Period, agriculture was king, especially maize grown in huge settlements such as Cahokia, in southern Illinois and at various settlements along the Mississippi and other large waterways such as the Ohio River (i.e. Effigy Mounds Historic Site in Iowa, Serpent Mounds in Ohio). Cahokia the largest town north of the Rio Grande River in North America included central plazas, wood henges, and administrative buildings in the city centers. Long distance trade was still conducted. Burial mounds of the Woodland period changed to different types of effigy mounds, round, conical, elongated, etc. that were oftentimes shaped to imitate animals. The largest man-made mound in the US is Monk’s Mound at Cahokia, a UNESCO heritage site. There was no single reason for why the Mississippian culture collapsed as it was likely a number of factors (drought, food shortages, civil unrest, etc.) that led to its demise. Leaving the huge metropolitan settlements, the people who lived in these cities returned back to their former haunts in places like the Illinois Valley (although many people remained at their traditional village sites and never relocated to sites like Cahokia).

Exploratory Period/European Contact (year 1520 through 1670)
This is the period between when Europeans arrived in North America but had not yet arrived in places like Illinois. European manufactured trade goods may have proceeded European presence in places like Illinois by 50 years.

Historic Period (year 1670 to present)
The Historic Period began when the first Europeans arrived and wrote down what they saw. In the Starved Rock area and central Mississippi Valley, the Historic Period began during the summer of 1673 when Jolliet and Marquette's voyage of discovery made contact with the tribes of this area. From that time forward, the written historical record replaced archaeology and to some extent, linguistics, in recording the customs, language, and culture of the tribes.



When the first Europeans (French) arrived in the upper Illinois Valley, the predominant tribes was the Illinois (who called their alliance of about 12 subtribes, "Inohka"). The Illinois Confederation historically occupied a vast area stretching from what is now Missouri to the shores of Lake Michigan, extending north into present-day Wisconsin and south toward the Arkansas River. In 1673, the Kaskaskia subtribe of the Illinois also known as the Inohka lived along the Illinois River, situated upstream from Starved Rock. Plum Island, located to the west of the Starved Rock Lock and Dam, was an important gathering place for council meetings among the Illinois people. Between 1673 and 1680, various subtribes of the Illinois joined the Kaskaskia in their village, resulting in a population increase that reached between 7,000 and 8,000 people by 1677. In 1680, the Iroquois (Haudenosaunee) attacked Kaskaskia and drove the Illinois out of their claimed lands, many of which settled at their old village sites along the Des Moines River in Clark County, Missouri.

1680 - French explorer Robert Cavelier Sieur de La Salle reports 460 "cabins" of Illinois people at the Grand Village of the Kaskaskia just upstream from Le Rocher, today's Starved Rock.

The Illinois People's way of life was marked by a seasonal pattern centered around agriculture and hunting. They alternated between semi-permanent summer villages and winter hunting camps, returning to their summer homes in the spring. Their shelters were made from reed mats, which allowed for easy dismantling and relocation. The Illinois cultivated the "Three Sisters"—maize, beans, and squash—while also foraging for wild foods such as nuts, fruits, roots, and tubers. The men of the Inohka hunted and fished year-round, pursuing various mammals, birds, turtles, and fish. During the summer, they participated in bison hunts that typically lasted three to five weeks.

Trade played a vital role in the lives of the Illinois. They exchanged goods with other tribes in the Great Lakes region and occasionally with more distant tribes. They also traded with the French at Fort Saint Louis atop Starved Rock, known to them as Le Rocher, in 1683. Fort St. Louis was headquarters for French trade and diplomacy and was a visible symbol of French hegemony to the native people in the region. Beginning in 1683, when the fort was built on Starved Rock, French explorer Robert Cavelier (also known as La Salle) convinced numerous Illinois subtribes and other native groups to relocate to northern Illinois. Historians often refer to this collection of tribes as La Salle's "Indian Colony." The fort remained on Le Rocher, the Rock, until it was abandoned in 1691.

Photo of diorama of Fort St. Louis.

1690 - Henri Tonti and Robert Rene Cavalier Sieur de LaSalle construct Fort Saint Louis on top of Le Rocher in Illinois Territory.

The Miami (also a subtribe of the same name-the Crane Clan) lived along today's Iroquois River near Grant Park, Illinois. The Piankashaw and Miami lived at the juncture of the Kankakee and Des Plaines Rivers. Other Miami groups lived on Buffalo Rock and near today's Hennepin.

A Shawnee band lived somewhere between today's Starved Rock and the Vermilion River. A band of Otoe, a trans-Mississippi tribe who lived along the Des Moines River in Missouri, lived somewhere on Bureau Creek, near the "Big Bend" above Hennepin. Several Mohegan (not Mohecans) lived in or around Fort St. Louis. Numerous Illinois groups reestablished themselves at the old Kaskaskia village site. In 1691, many Illinois groups who lived at their Grand Village across the river from Starved Rock relocated to semi-permanent summer villages at Lake Peoria while others moved to southern Illinois to places like Kaskaskia (the second Kaskaskia and Illinois' first state capital), and at today's Cahokia, across the Mississippi from St. Louis, Missouri.

End of the 17th Century-The Cahokia, Tamaroa, Michigamea, Kaskaskia, and Peoria are all that remains of the 12 tribes of the Illinois. Smaller tribes were adopted into larger tribes of the area.

In 1712, a band of Peoria returned to the Starved Rock area, living at site including the base of Starved Rock, on Plum Island. In 1722, the other Peoria group joined the first group at Starved Rock. After they were besieged by a Fox (Meskwaki) Indian war party in 1722, the Peoria fled the Starved Rock area, returning in 1703.

The last Illinois groups abandoned their semi-permanent village near Starved Rock in 1741, although the Illinois still used sites along the Illinois River corridor for winter hunting camps until the winter of 1760-61 (the last time they were recorded in the upper Illinois Valley).

The Potawatomi, beginning in 1763, claimed all lands along the Illinois River, from the Forks (the juncture of the Des Plaines and Kankakee Rivers) to Starved Rock. The Potawatomi (and some of their close cousins the Ojibwe and Odawa) lived in small hunting villages in northern Illinois, in prairie groves like Paw Paw and Earlville, and along Indian Creek, the Kankakee River, and the Illinois River. In 1833 the final treaty between the US government and the Potawatomi was signed at Chicago.

The entry of European settlers and the subsequent westward expansion posed various difficulties for Indigenous communities, leading to mandatory relocations, confrontations, and the spread of illnesses. The pressures to conform, along with the loss of their ancestral territories, resulted in a significant decrease in both their populations and cultural traditions. As a result, numerous individuals were forced to relocate or were taken in by different tribes, leading to considerable changes in the social and political frameworks of these tribes. The lasting impact of these tribes is a crucial part of the area's historical story.

1803 Treaty of Vincennes-Kaskaskia, Tamaroa, Michagamea, and Cahokia cede all but 1,600 acres of their ancestral land to the U.S. Government.

1818 Treaty of Edwardsville-The Kaskaskia allied with the Peoria and exchanged their remaining lands in Illinois for lands in Missouri.

1832 Treaty of Castor Hill-The Kaskaskia and Peoria are forced to give up their lands in Missouri for lands along the Osage River in Kansas.

1854 - The Piankashaw and Wea Tribes merge with the Kaskaskia and Peoria Tribes.

1867 Omnibus Treaty-The Kaskaskia, Peoria, Piankashaw, and Wea cede their lands in Kansas for land in Oklahoma.

1870-The U.S. government establishes an educational system for Native American children. This severely impacts Native American communities, particularly youth, who are physically and mentally abused for speaking their native languages or practicing their cultures within these establishments.

1935- The Sam Sine family part of the Ho-Chunk Nation from Wisconsin was invited to move into Starved Rock State Park coinciding with the completion of the CCC's project of the Starved Rock Lodge. Sam was given a job as doorman at the Lodge, and he became good friends with the George Spiros the manager of the Lodge and did informative programs for the park visitors on a monthly basis.

1956 - The Peoria Tribe is officially dissolved under the federal government's termination policy, but never ceases operating as a government for its people.

1962- Sam Sine began annual Pow wows at the park that drew much scrutiny as to his residing within the park. He was moved out and purchased a parcel on the west edge of the park near St. Louis Canyon.

1978 -Congress restores legislation giving federal recognition to the Peoria Tribe of Indians of Oklahoma.

1995- Sam Sine crossed over in 1995, and the property by St. Louis Canyon was sold to the Ho-Chunk Tribal Nation. It remains as Ho-Chunk Tribal property today.

2025- Gov. JB Pritzker signed legislation authorizing the Illinois Department of Natural Resources to hand over the ownership title to Shabbona Lake State Park, a 1,500-acre tract in southern DeKalb County that largely overlaps the Potawatomi Nation's original reservation. Senate Bill 867, sponsored by Sen. Mark Walker, D-Arlington Heights, also requires the tribe and DNR to enter into a land management agreement that will keep the land open for public recreation.

2025- Community Pow wows reintroduced to the area and hosted in Utica through a collaboration with Gerald Savage (Sam Sine's grandson) and the LaSalle County Historical Society.

Indigenous communities continue to exist today and thrive as distinct cultural and political groups. A vital lesson for contemporary society can be learned from the history of American Indian removal, which emphasizes the importance of human rights, intergroup relations, and the outcomes of specific national policies and actions.

The following tribes represent Indigenous groups whose ancestral lands are located in Illinois. Instructors can get in touch and request further information and possibly guest lecturers for their classrooms.

The Peoria Tribe of Indians of Oklahoma is located in Miami, Oklahoma, and is made up of the Kaskaskia, Peoria, Wea, and Piankashaw tribes. https://peoriatribe.com/

Prairie Band Potawatomi Nation is located in Mayetta, Kansas. https://www.pbpindiantribe.com/tribal-history/

Ho-Chunk Nation is located in Black River Falls, Wisconsin. https://ho-chunknation.com/

Kickapoo Tribe of Oklahoma is located in Mcloud, Oklahoma. https://www.kickapootribeofoklahoma.com/

Meskwaki Nation is located in Tami, Iowa, and is made up of the Sac, Fox, and Meskwaki tribes. https://www.meskwaki.org/

Miami Nation of Indiana is located in Peru, Indiana. https://www.miamiindians.org/

The Great Lakota, Dakota, and Nakota Nation (Ocethi Sakowin) is located in Mato Tipila, Wyoming. https://lakotadakotanakotanation.org/about/

The Osage Nation is located in Pawhuska, Oklahoma. https://www.osagenation-nsn.gov/

The Quapaw Nation is located in Quapaw, Oklahoma. https://www.quapawtribe.com/

The Shawnee Tribe is located in Miami, Oklahoma. https://shawnee-nsn.gov/

Pre- or Post-Visit Activities

(Online lesson plans with activities, videos, and reading material)

- **Declaration of Rights of Indigenous Peoples through oral history**
  - **Objectives**
    - Students will be able to make connections between the rights laid out in UNDRIP and details from personal narratives from "How We Go Home."
    - Students will be able to explain how UNDRIP could help Indigenous peoples and communities respond to the challenges created by colonization and colonialism.
      - https://sharemylesson.com/teaching-resource/lesson-plan-understand-un-declaration-rights-indigenous-peoples-through-oral

- **Using Appropriate American Indian Terminology**
  - **Objectives**
    - Students consider the impact of racist and dehumanizing terms, before exploring how and why some groups have sought to reclaim such terms.
    - Students reflect on how racist and dehumanizing terms will be approached in the classroom.
    - Comprehend the historical and cultural significance of terms like “Native American,” “American Indian,” “Indigenous Peoples,” “Indian,” “First Nations,” “Aboriginal,” “Dakota,” “Ojibwe,” “Anishinaabe,” “Chippewa,” “Ho-Chunk,” “Winnebago,” “Oceti Sakowin,” “Tribe,” “reservation,” “Tribal nation,” and “powwow”.

        - Analyze the implications of using inappropriate or dehumanizing language when speaking about or with American Indians.
            - https://www.understandnativemn.org/wp-content/uploads/2024/05/EverythingIndian_Guide01_Using-Appropriate-Indian-Terminology.pdf

- **American Indian Removal. What Does It Mean to Remove a People?**
    - **Objectives**
        - Students will analyze the overarching problem or challenge presented in the contemporary case studies.
        - Students will reflect on two contemporary case studies that could be considered examples of removal today and form comparisons to their understanding of American Indian removal.
        - Students will construct an argument (e.g., detailed outline, graphic, presentation, or essay) that addresses consequences of policies and actions taken by nations, using specific claims and relevant evidence from historical and contemporary sources, while acknowledging competing views.
            - https://americanindian.si.edu/nk360/removal#
            - https://nativeamericanstoday.com/tribal-treaties-explained/
            - https://digitreaties.org/treaties/resources/

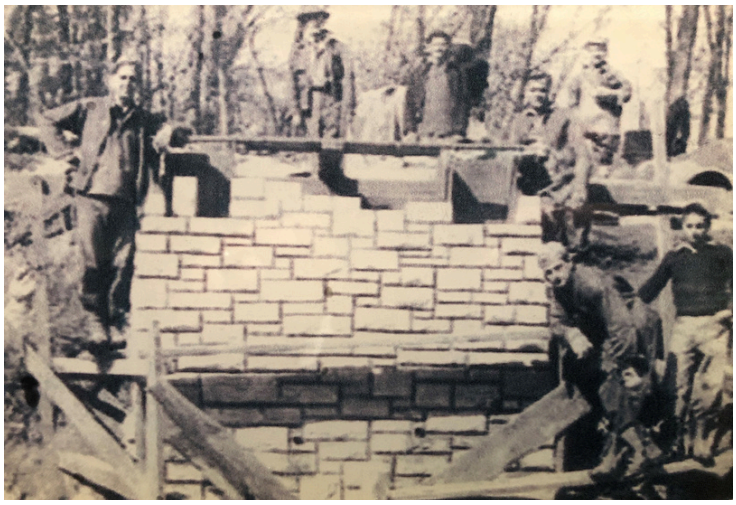
- **Native American Boarding Schools**
    - **Objectives**
        - Students will articulate the historical context and purpose of Native American boarding schools, emphasizing the impact of cultural assimilation on Indigenous identities.
        - Students will evaluate firsthand accounts and historical documents to assess the treatment of Native American children in boarding schools, identifying key themes of trauma and resilience.
        - Students will reflect on the long-term consequences of cultural erasure resulting from boarding school policies, discussing how these experiences have shaped contemporary Native American communities.
        - Students will relate the historical experiences of Native American boarding schools to present-day issues affecting Indigenous communities, fostering critical thinking about ongoing cultural and social challenges.
            - https://ospi.k12.wa.us/student-success/access-opportunity-education/native-education/native-education-curriculum-materials
            - https://www.youtube.com/watch?v=UGqWRyBCHhw

- **Interactive Indigenous Land Maps and Land Acknowledgement Activities**
    - **Objectives**
        - Students will identify the key concepts of land acknowledgment and explain its historical significance and relevance to Native American communities.
        - Students will analyze the impact of the “doctrine of discovery” on Native American lands and communities and discuss the importance of presenting the true history of Indigenous peoples.
        - Students will evaluate contemporary land acknowledgment initiatives and their role in promoting respect and recognition for Native American cultures and histories.
        - Students will articulate the significance of truth-telling and reconciliation efforts in addressing the ongoing effects of colonization and broken treaties.
            - https://www.nea.org/sites/default/files/2025-10/landacknowledgementguide_updated.pdf
            - https://native-land.ca/
            - https://icmglt.org/this-interactive-map-shows-which-indigenous-lands-you-live-on/

Civilian Conservation Corps

On July 1, 1932, New York Governor Franklin D. Roosevelt accepted the Presidential nomination. He intended to address issues such as soil erosion and the depletion of timber resources by employing unemployed young men from major urban centers. President Roosevelt restored national confidence by initiating a "New Deal" for the country. Among the initiatives of this New Deal was the Emergency Conservation Work (EWC) Act, widely recognized as the Civilian Conservation Corps.

At the outset, the program was open to all married, unemployed male citizens aged 18 to 25, who could apply as junior enrollees. The ECW program initially aimed to aid unemployed youth but underwent two key adjustments in early 1933. First, it expanded to include about 14,000 Native Americans. Second, around 25,000 locally employed men (LEM) were enrolled to provide training and guidance to unskilled participants transitioning from urban life. The President issued Executive Order 6129 on May 11, 1933, allowing the immediate enrollment of about 25,000 veterans from the Spanish American War and World War I, with no age or marital status restrictions.



CCC company constructing the Wildcat Canyon bridge.

A typical Civilian Conservation Corps (CCC) camp would consist of a minimum of 11 structures, which would include four barracks, a dining hall, a recreation hall, a medical facility, quarters for officers, garages, a restroom, and a shower facility.

During the 1930s, Companies 614, 1609, and 2601 were based at Starved Rock State Park. Company 2601 was located where the visitor center and park maintenance facilities currently stand, while Company 614 had its tent barracks situated near the boat ramp at the park's west entrance. Parkman's Plain at Starved Rock State Park was home to the largest CCC Company, 1609. Today, two of the original CCC barracks remain at the park, repurposed as warehouses.

Also known as the "dollar a day boys", a considerable portion of each participant's monthly allowance of $30 was given to their families. In addition to this, financial support for a standard five-day workweek, the young men received three meals daily, accommodation, clothing, footwear, vaccinations, and a range of medical and dental care. They also had opportunities for vocational, academic, or recreational training. Many enlistees joined the CCC, unable to read or write. They emerged after a six-month to two-year service period with literacy skills, a high school diploma, and competencies in areas such as carpentry, masonry, radio telemetry, and forestry, among others.

CCC Company 614 at Starved Rock State Park. The camp was originally located where the boat ramp is located today.

The public works taken on by the CCC were varied and monumental. Many of the large-scale projects, nationally, involved the protection or reforestation of woodlands, including a major push to control forest fires. About 2.5 billion trees and 814,000 acres of grazing land were replanted. These efforts earned the CCC participants the nickname of “Roosevelt’s Tree Army”.

The CCC efforts were not confined to forest projects. The following were also due to the CCC and its work efforts in our nation:

- 7,622 dams were built
- 972 million fish were restocked
- 154 million square yards of stream banks were protected from erosion
- 52,000 acres of campgrounds were created
- 4,000 historic structures were renovated
- Buildings such as lodges, cabins, and shelters were built including the original section of the Starved Rock Lodge and its surrounding cabins and the fireplace in the Great Hall.
- Trail improvements or creation of suitable trails in both State and National Parks. Over 1,000 miles of trails were created by the CCC in Illinois.
- In Illinois alone over 60 million trees were planted.

Pre- or Post Visit Activities

(Online lesson plans with activities, videos, and reading materials)
https://www.pbs.org/wgbh/americanexperience/features/ccc-teacher-resource/
https://ccclegacy.org/history-center/ccc-brief-history/

#1 The CCC- A Modern Solution?

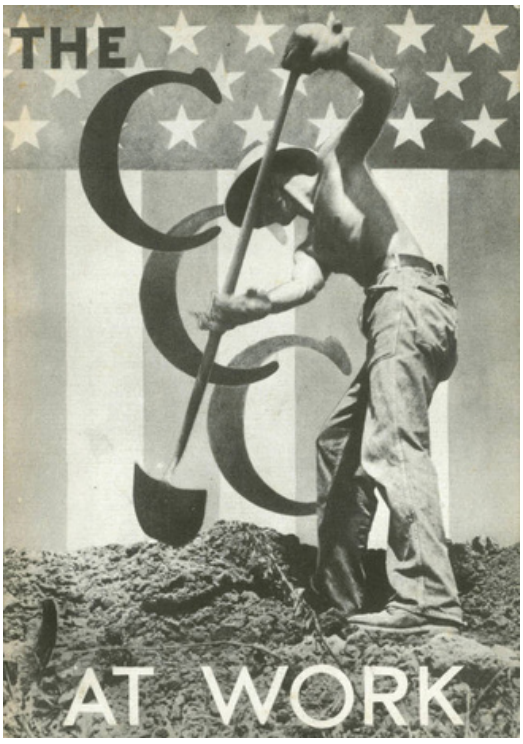
- **Objectives**
  - Examine social and economic need for the CCC
  - Review the program organization and its accomplishments
  - Analyze the overall success of the program. Did it meet or exceed its intended goals?
  - Consider whether a similar program would be appropriate in modern times

#4 Mapping the CCC Camps

- **Objectives**
  - Examine the CCC camps and projects within your community, state, or selected region.
  - Evaluate the importance of these projects to the community and the larger impact on the nation.

#5 Daily Life in the CCC

- **Objectives**
  - Examine the lives of the CCC participants.
  - Consider how you might have viewed the experience if you were in the same situation.



Starved Rock State Park Area Activities

Things to Do:

- Visit the Visitor Center and watch a short film.
  - 15 min: In the Shadow of the Rock (history, geology, and ecology of the park)
  - 15 min: On the Wings of the Wind (bald eagles)
  - 15 min-Civilian Conservation Corps (1930s history at the park)
- View the exhibits in the Visitor Center that detail the park's history, geology, and ecology.
- Reserve an IDNR Resource Trunk ahead of time with the Natural Resource Coordinator (lisa.sons@illinois.gov) and use the trunk materials in class before the visit or reserve the Eagle's Roost Cabin located behind the Visitor Center for a classroom on-site and location for lunch.

Starved Rock State Park Visitor Center.

Things to See and Places to Visit:

- Visit the bison at Buffalo Rock State Park located North of Starved Rock across the Illinois River on Dee Bennett Rd. Hike the prairie and woodland trails along the bluffs of the river.
- Schedule a visit to the Illinois Waterway Visitor Center operated by the U.S. Army Corps of Engineers. View exhibits or engage in a Ranger-led program about the Illinois Waterway, Illinois River, and the Starved Rock Lock and Dam.
- Schedule a visit with the LaSalle Historical Society and Museum in downtown Utica.
- View the historical Starved Rock Lodge on the bluff behind the Visitor Center. Hike the sidewalk around the Lodge to view the wood carvings and sculptures.

One of the bison at Buffalo Rock State Park.
Photo by Heather Wellman.

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

EVERYONE BELONGS IN NATURE

Visit dnr.illinois.gov to view state parks by region under the Parks and Recreation tab. Read over the trail maps, trail suggestions, rules, and regulations (stay on marked trails), and head out with your group to explore and learn in nature! Here are some recommended trails for youth at Starved Rock State Park. Please ensure you have at least 1 adult for every 5-8 children (ages up through high school).
Happy Hikers=Happy Trails!