

WATER LITERACY PROJECT



Ripple Effect

September 17. 2019

NEW ORLEANS, LA

2019

RIPPLEEFFECTNOLA.COM

Agenda

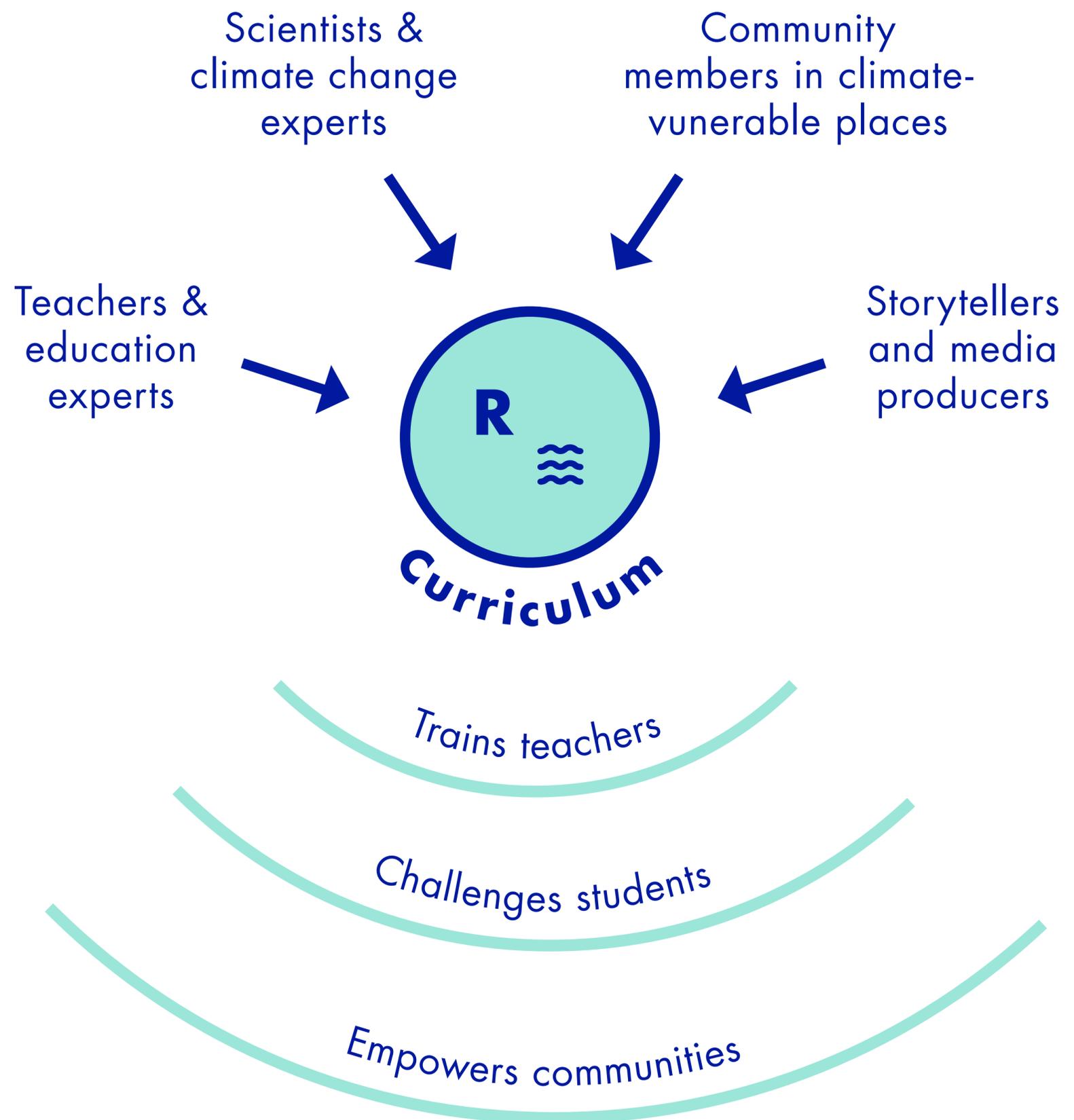
1. **Context**
2. **Example unit**
3. **Goals & Questions**

Mission

We educate and empower the next generation of water-literate leaders.

Vision

We envision a future where all citizens have the knowledge and creativity they need to strengthen their communities and live with water in an era of climate change and sea level rise.



Guiding Principles

Make learning visible

For teachers, by teachers

Science needs stories

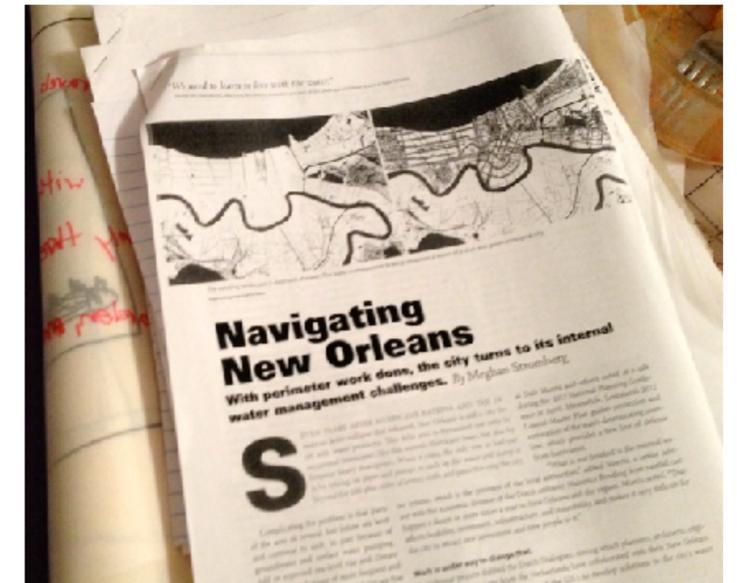
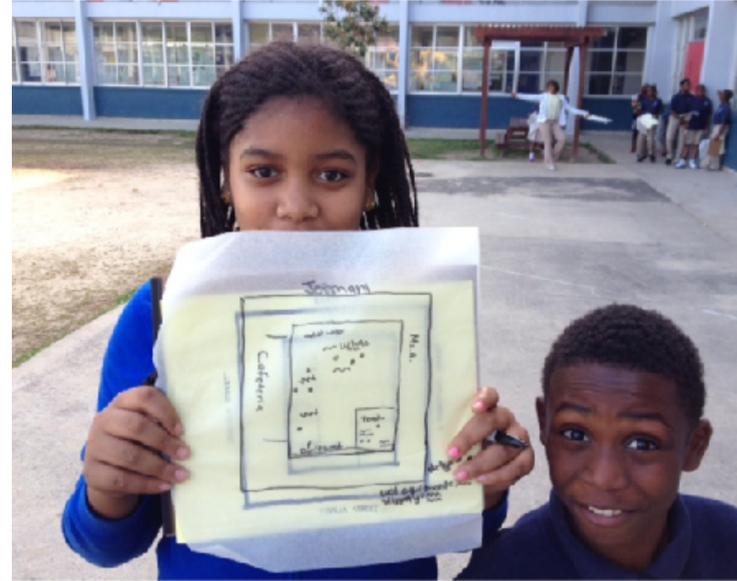
Context

- **Unequal access to high-quality education**
- **Urgent environmental issues**
- **New science standards are rigorous and challenging shift**





2012: 4th Grade Water Workshop



Open Ocean
Interior Water
Wetland

Alligator Crawfish Bivalves Crab Shrimp Fish Cephalopod

These types of wildlife make their habitat in the swamps, marshes, and waterbodies of Louisiana's coast. The color of the circle corresponds to each species' habitat.

HYBRID LANDSCAPE

MAP 10. ECOLOGICAL ZONES AND ENERGY INFRASTRUCTURE

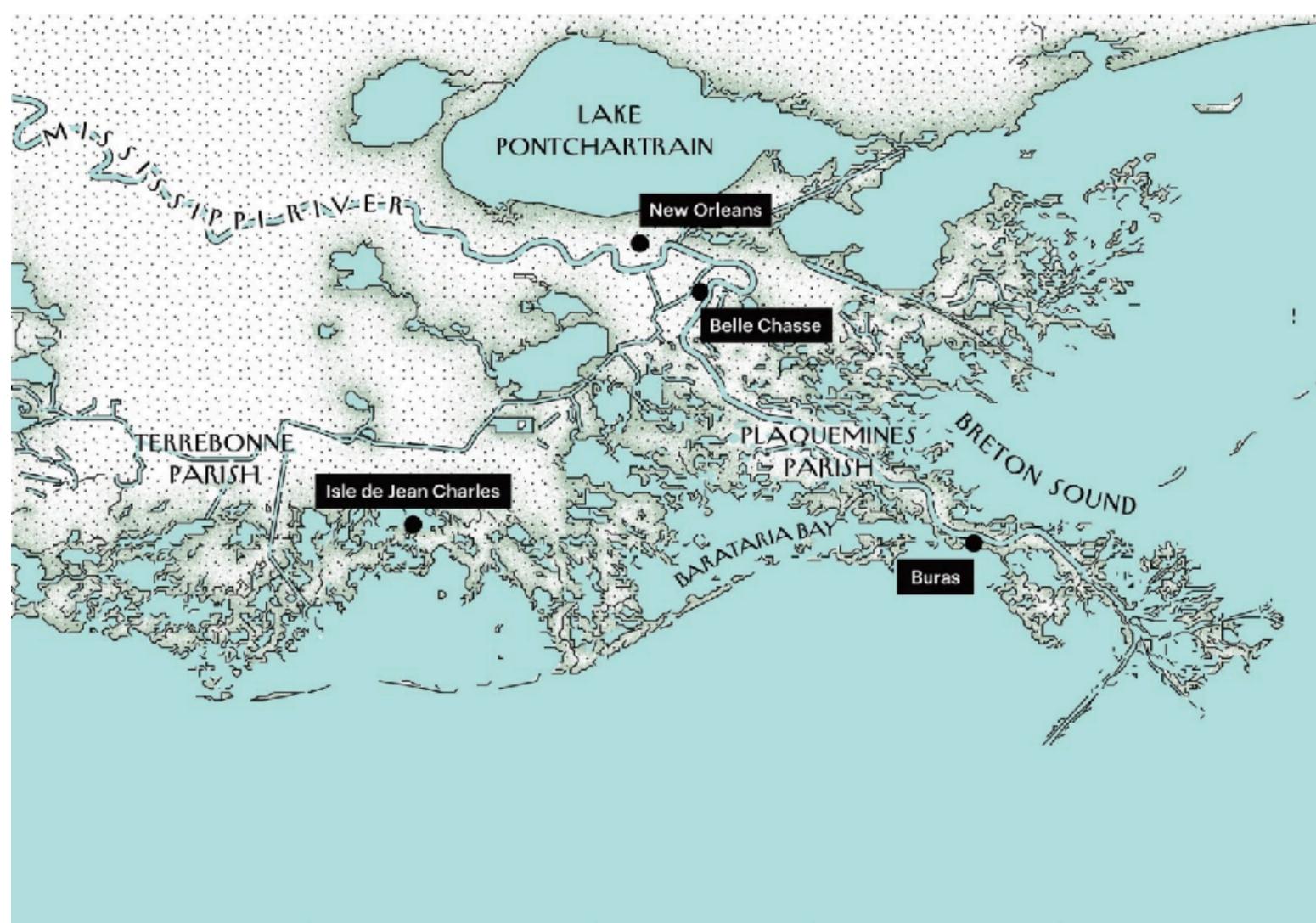
The map illustrates the expansive system of oil wells, pipelines, and leases throughout southeast Louisiana.

Sources: Research and Innovative Technology Administration Bureau of Transportation Statistics (RITA/BTS), 2006; Louisiana Department of Natural Resources, Office of Conservation, 2007; U.S. Department of the Interior, Minerals Management Service, Gulf of Mexico Region, 2005; Louisiana Department of Natural Resources Office of Coastal Management, U.S. Department of the Interior, U.S. Geological Survey, National Wetlands Research Center, 2012; NOAA Office of Response and Restoration, 2013; for all basemap data, see References

Legend

- New Water
- Saltwater
- Fresh Marsh
- Scrub Wetlands
- Swamp
- Land
- Wetlands
- Water
- Parish Boundary
- Major Navigable Waterway
- Active Oil Well
- Inactive Oil Well





Southeast Louisiana, where the Mississippi River meets the Gulf of Mexico, as it is often depicted on maps.



What maps would look like if they showed only solid land. The light blue indicates swamps, marshes, and wetlands.

THE CONTROL OF NATURE

LOUISIANA'S DISAPPEARING COAST

The state loses a football field's worth of land every hour and a half. Now engineers are in a race to prevent it from sinking into oblivion.

By Elizabeth Kolbert March 25, 2019





National

Governor declares emergency in New Orleans as pump system is compromised

CARBON'S CASUALTIES

Resettling the First American 'Climate Refugees'

A \$48 million grant for Isle de Jean Charles, La., is the first allocation of federal tax dollars to move an entire community struggling with the effects of climate change.

Isle de Jean Charles in southeastern Louisiana. A \$48 million federal grant has been allocated to resettle its residents because of flooding. Josh Haner/The New York Times

By Coral Davenport and Campbell Robertson

May 2, 2016



Opinion

Miami Battles Rising Seas

In 2017, voters agreed to finance adaptation efforts through property taxes. Now the first phase of those projects is underway.

U.S. | NEW YORK

New York City's Sandy Rebuilding Program Was Plagued From the Start, Study Says

More than half of the roughly 20,000 people who registered for assistance left the Build It Back program



Put IT in the lead.

IT knows digital — and they don't. It's time to get digital transformation for nothing.

Read the Article **servicenow**



LEADS

FEATURES

VIEW FROM HERE



SPECIAL FEATURES

THE EYE | FEATURES

Whitewashed: The Lack of Diversity in Environmental Studies

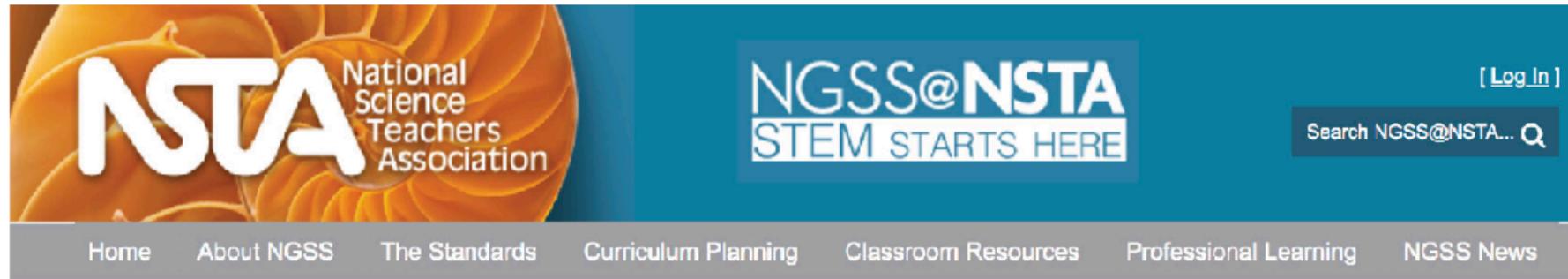
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Why hasn't anyone told us this before?

- Kaliyah, 4th grade

KIPP Central City Primary, New Orleans



- there are nearly 100,000 public schools in the United States

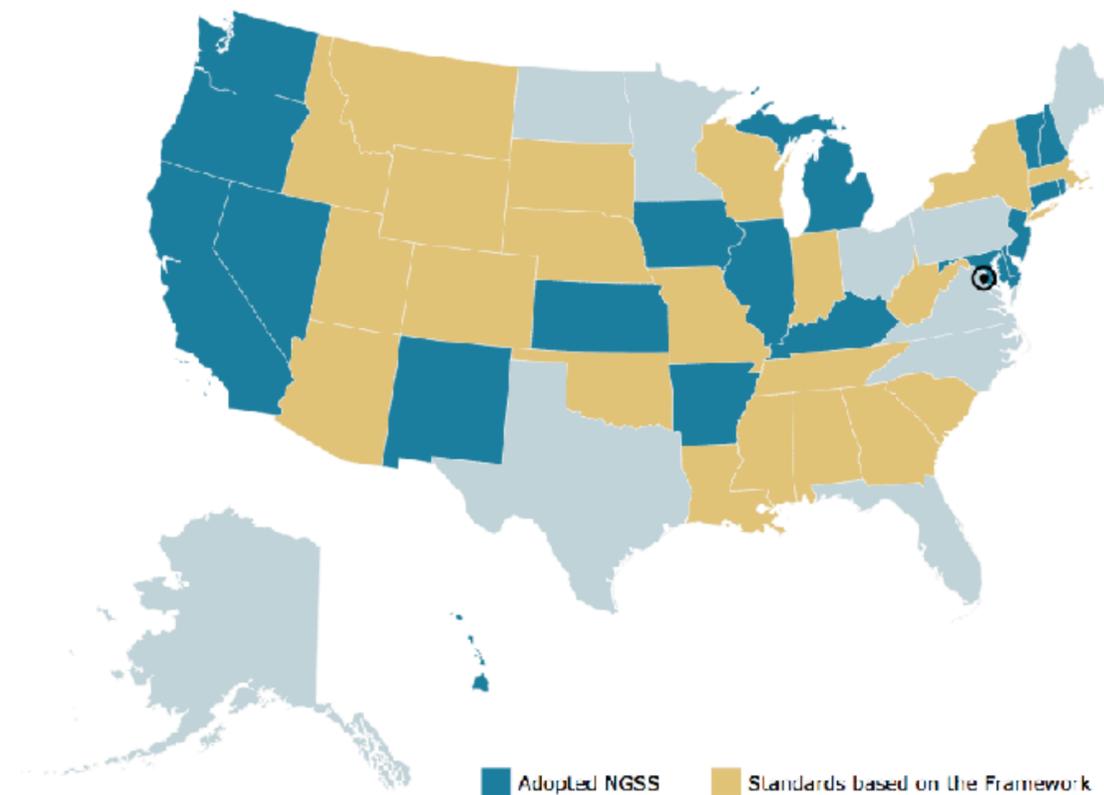
- in the past 5 years, 40 states have either adopted the standards or adopted a modified version of the new standards

- the new standards represent a sea-change in how science is taught at all levels of K-12 education

from National Science Teachers Association
<https://ngss.nsta.org/about.aspx>

K-12 Science Standards Adoption

Click on a state for more information!



Nearly two-thirds of U.S. students live in states that have education standards influenced by the *Framework for K-12 Science Education* and/or the *Next Generation Science Standards*.

“Instead of telling students what the established scientific models are, the goal is for students to develop (with support) these ideas for themselves through exploration of evidence and vetting of ideas, just as scientists do.”

**Introduction to Disciplinary Core Ideas: What They Are and Why They are Important
National Science Teachers Association, 2017**

EARTH'S SYSTEM

<p>Performance Expectation</p>	<p>Plan and conduct investigations on the effects of water, ice, wind, and vegetation on the relative rate of weathering and erosion.</p>
<p>Clarification Statement</p>	<p>Examples of variables to test could include angle of slope in the downhill movement of water, amount of vegetation, speed of wind, relative rate of deposition, cycles of freezing and thawing of water, cycles of heating and cooling, and volume of water flow.</p>

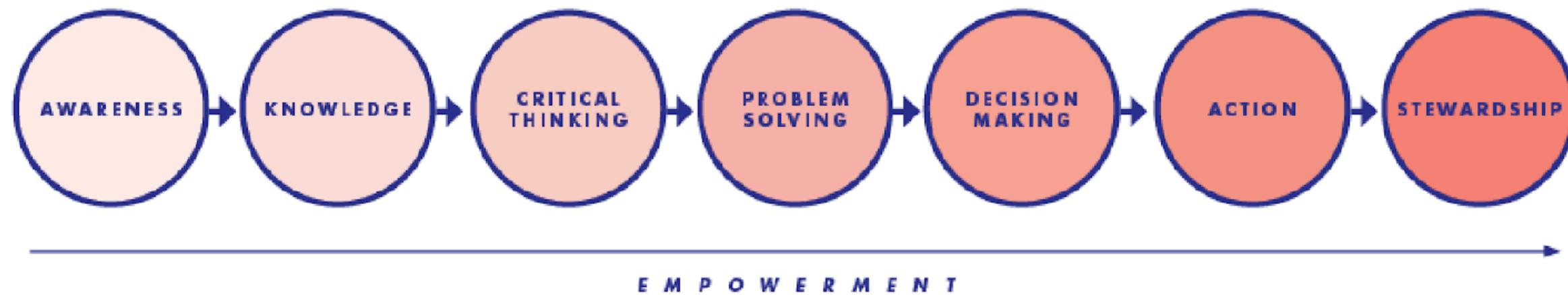


<p>Science & Engineering Practices</p>	<p>Disciplinary Core Ideas</p>	<p>Crosscutting Concepts</p>
<p>1. Asking questions and defining problems</p> <p>2. Developing and using models</p> <p>3. Planning and carrying out investigations: Planning and carrying out investigations to answer questions (science) or test solutions (engineering) to problems in 3-5 builds on K-2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.</p> <ul style="list-style-type: none"> Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. <p>4. Analyzing and interpreting data</p> <p>5. Using mathematics and computational thinking</p> <p>6. Constructing explanations and designing solutions</p> <p>7. Engaging in argument from evidence</p> <p>8. Obtaining, evaluating, and communicating information</p>	<p>EARTH MATERIALS AND SYSTEMS Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around. (UE.ESS2A.a)</p> <p>BIOGEOLOGY Living things affect the physical characteristics of their environment. (UE.ESS2E.a)</p>	<p>CAUSE AND EFFECT Cause and effect relationships are routinely identified, tested, and used to explain change.</p>

4th Grade LSS (Earth Sciences)

**Generate and compare
multiple solutions to reduce the
impacts of natural Earth
processes on humans.**

Environmental Education Continuum



Developed by the United States Environmental Protection Agency (empowerment arrow added)



My favorite part of Ripple Effect was creating things to help other people, because they might help me one day.

AZAREEYAH, 4TH GRADE RIPPLE EFFECT STUDENT

Topographic model courtesy of Derek Hoferlin and his students at Washington University in St. Louis.

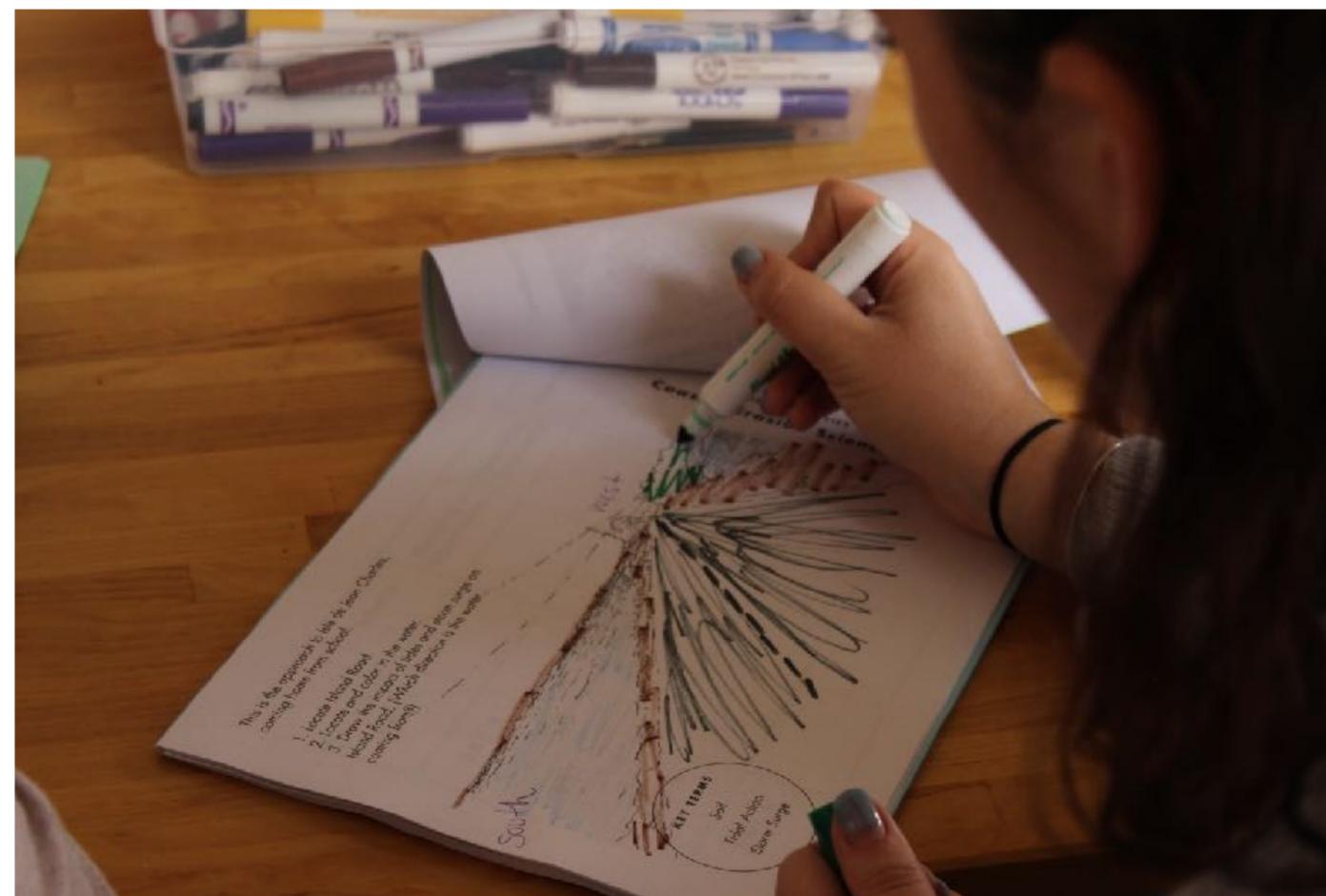


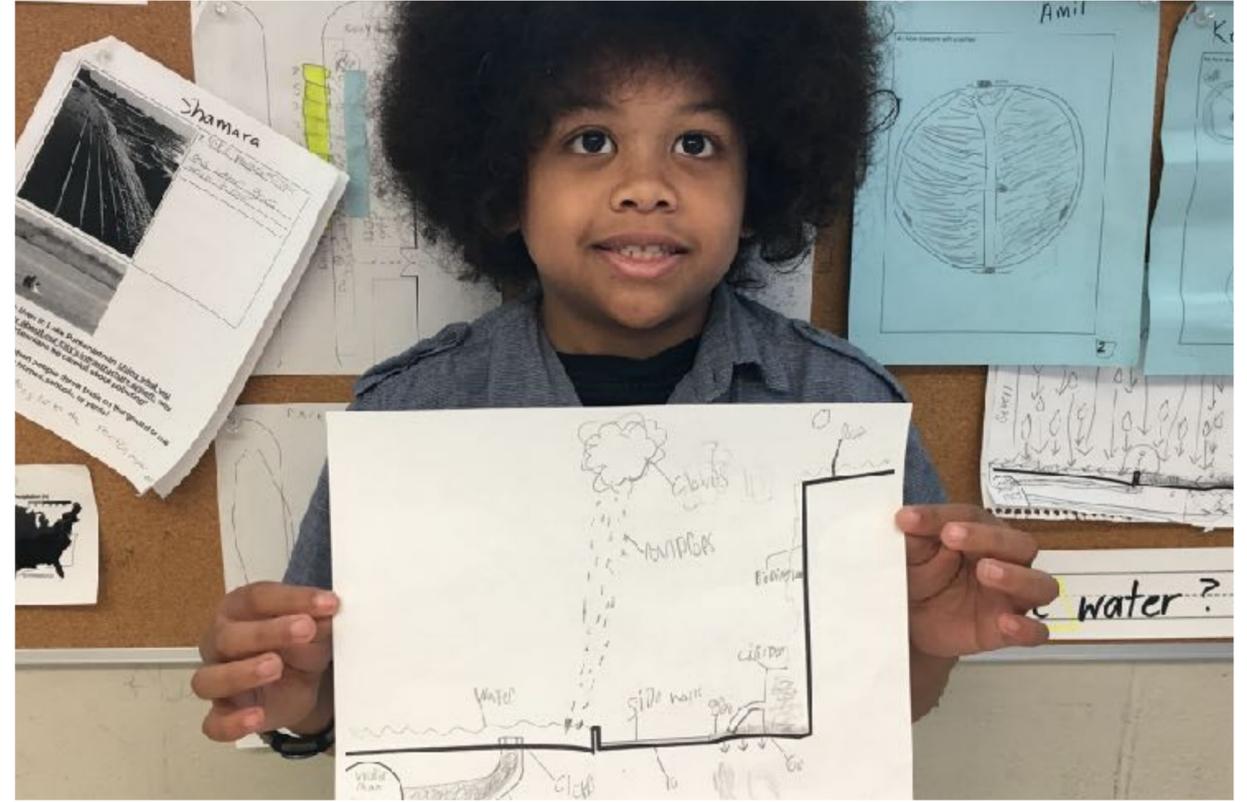
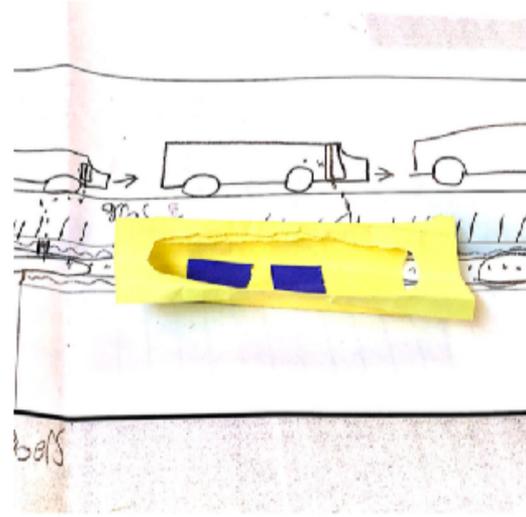
Teachers as agents of change





Teachers as agents of change

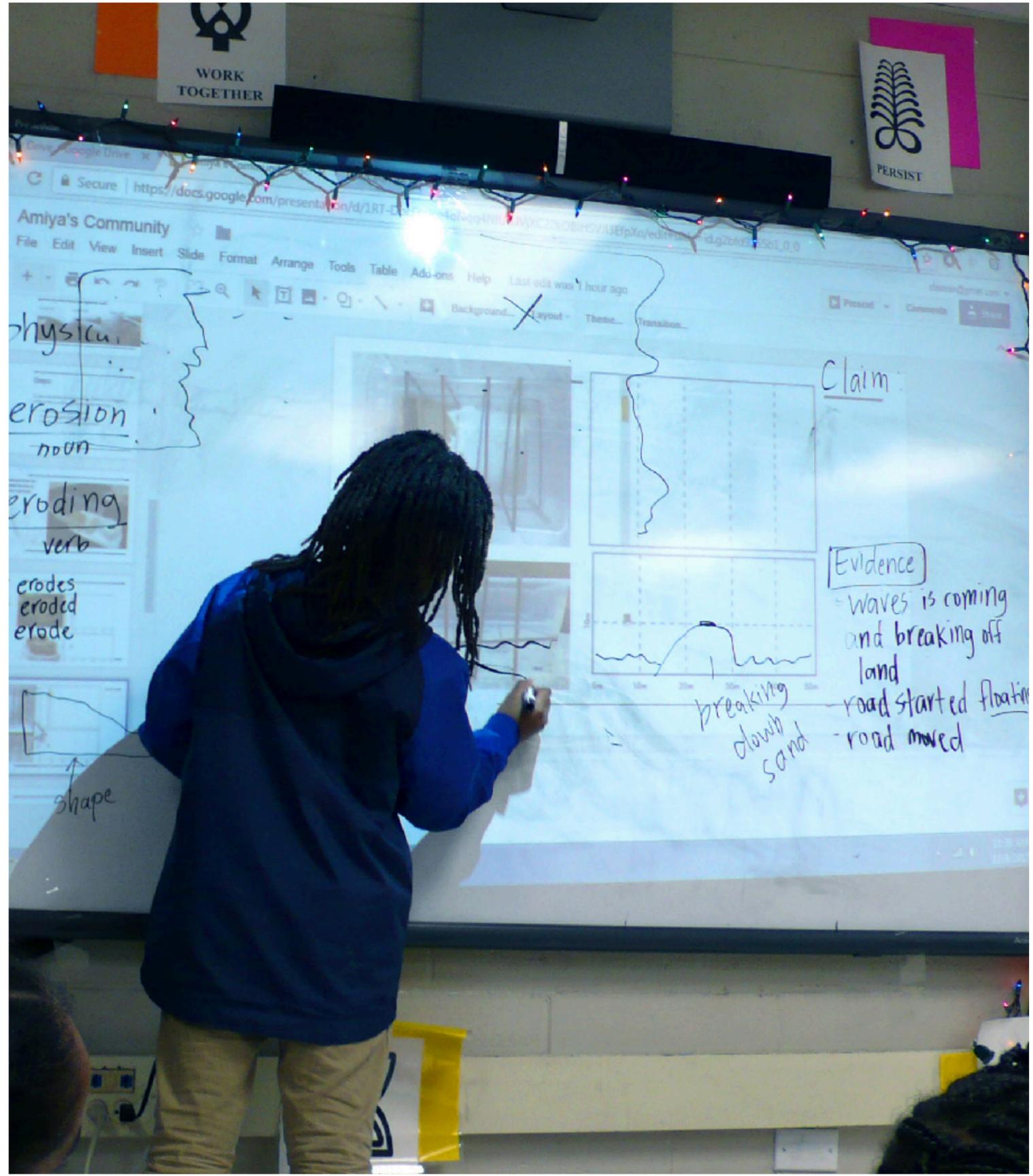
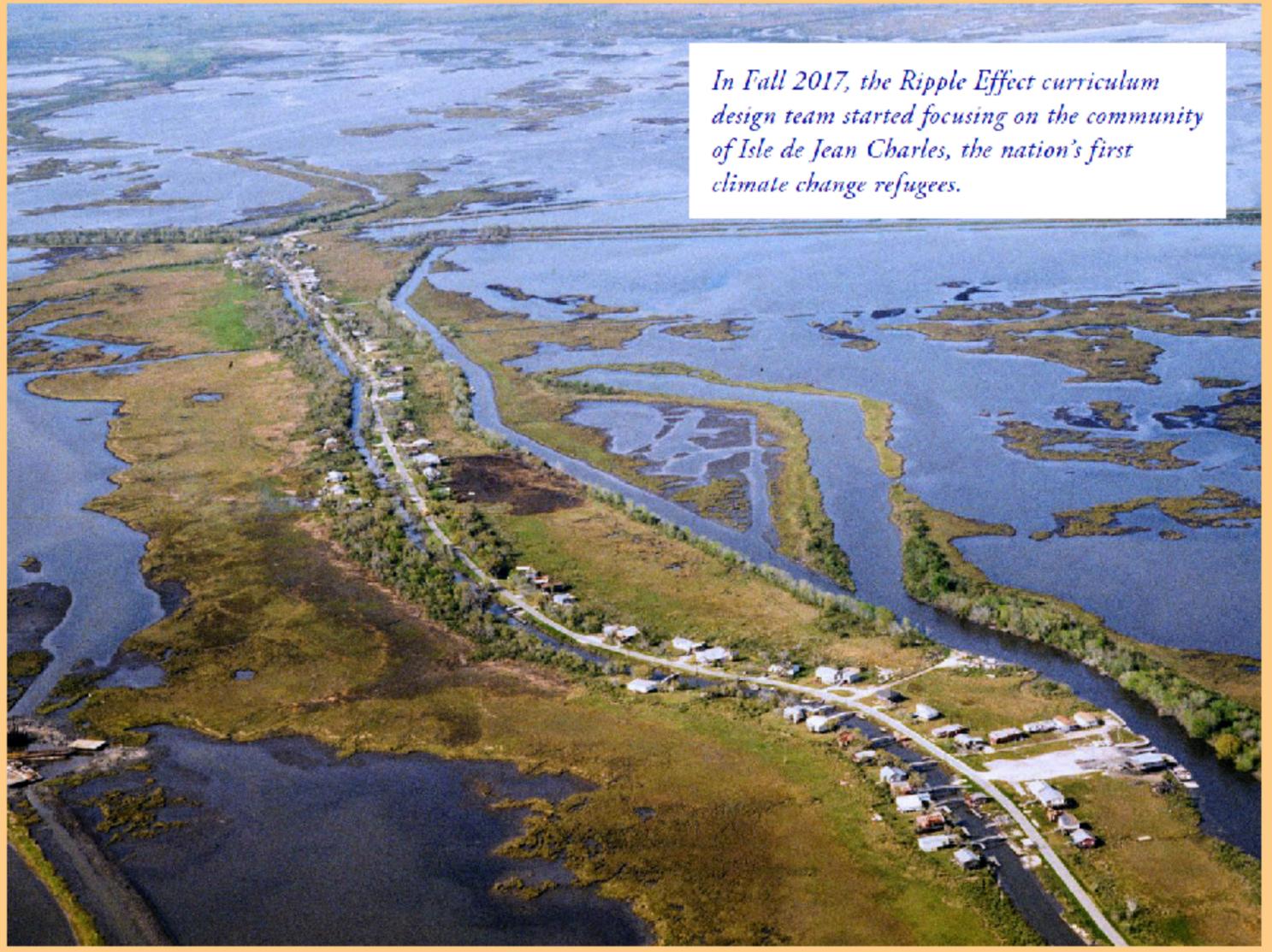




An aerial photograph showing a coastal community on Isle de Jean Charles, Louisiana. The image captures a narrow strip of land with several small houses and buildings, surrounded by extensive flooding. The water is a deep blue, and the remaining land is a mix of green and brown, indicating marshland loss and erosion. A road runs along the length of the island, and the surrounding area is a complex network of waterways and submerged land.

In Fall 2017, the Ripple Effect curriculum design team started focusing on the community of Isle de Jean Charles, the nation's first climate change refugees.

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Goals

Pioneer a national, equity-based vision for water literacy education.

Connect more teachers, students and families to water literacy through innovative curriculum and teaching tools.

Questions

- **How can the stories of lived experiences be meaningful yet also maintain scientific, dispassionate objectivity?**
- **How do we introduce students to issues of climate change, without distraction from climate science's continuous evolution, external social pressures, or politicization?**
- **How do we instill stewardship without placing an amount of responsibility on young people?**



Thanks

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