DESIGN 2: four schematic designs
Using a hopper barge, this scheme creates an experience of the river both above and below the waterline.

The upper deck is envisioned as an outdoor classroom, a place to experience the horizontal expanse of the river. Rainwater falls between wooden slats of the deck, and is funneled to a filtration tank for use on the barge. PV panels are angled to direct rainwater into a water wall that extends to the space below.

The lower level of the barge becomes a hybrid space: classroom, amphitheater, exhibition hall. The experience is built around the concept of exploring the sectional changes of the Elizabeth River, from the sediment of the benthos to the plants and animals of the marsh, represented in the water wall. Opposite, the wood wall provides an armature for power systems, furniture, etc.

Laura Bandara
Matt McClellan
Katherine Pabody
Phoebe Richbourg
Flat Deck Barge

The surface of the flat deck barge becomes a metaphor for exploration, as layers are peeled and punctured, and infrastructure is uncovered to reveal the functions and structure of the barge.

The barge’s structural module establishes chambers that contain infrastructural elements such as wetland plants which filter grey water and batteries used to store energy generated by PVs.

The translucent PVs are inserted into an armature, and provide a canopy for the sheltered classroom while also meeting the electricity needs of the barge.

As the armature rises from the deck, amphitheater seating is built in, and wetland plants puncture these seats in places, providing a rare experience of immersion in wetland grasses.

A retractable shade cloth sits underneath the armature, making the enclosure a sort of nomadic tent during the hot summer months.

Along one side, a ramp permits access at different levels, and allows visitors to experience the water more closely.
The barge is imagined as a lens that focuses the student’s attention towards the river. Multiple spaces on the barge allow for different learning environments. The deck ramps toward the river, allowing greater engagement with the water. The barge has an upper deck and a lower deck 4 feet below. The lower deck includes a 575 square foot enclosed room, a hole cut to the river below, and “amphitheater” seating steps for 28 children.

An armature that holds the energy and curricular systems of the barge is built to reflect the many trestles and cranes in the region.

An expanse of uncovered deck acts as a void and counterpoint to the enclosure on the barge, promoting an unmediated experience of the sky, (eco)industrial shoreline, and winds.

Along one side of the barge, an armature engages students with the renewable energy systems and curriculum of the barge. Water storage and distribution, including solar hot water panels and a planting, is at one end, and the other end holds energy generation such as PV’s. Curriculum in the form of large maps of the watershed, and an archive of student drawings, crafts and writing is held within the armature, backlit by the river.
The Components Diagram at right is a visual encyclopedia of the component parts of the barge. Each image represents a line of research to determine the most suitable system or manufacturer.

The sketch below depicts the water cycle on the barge. A sloped roof conducts rain into a suspended cistern that stores the water for hand washing, and plantings are irrigated with any excess. Grey water from the sink flows to the planting, seeps through the planting soil matrix, and exits through the hole cut in the barge to the river below.

The Gathering/Enclosure Diagram shows a range of onboard spaces from fully to partially enclosed. A Circulation Diagram represents how docking on the barge occurs at the 8 foot or 4 foot level. This set of diagrams analyzes and explains the performance of the barge from several points of view, including technological and in terms of human occupation.
An enclosed, climate-controlled space is, by nature, not site-specific. A temperature and humidity controlled room is intended to be the same in the desert as it is on a river. The outside may be one condition, but once an enclosed space is entered, only the view is different. This project conceives of the entire barge as classroom that is transformed by its inhabitants rather than prescribed in advance.

Rather than typical walls, there are two cabinets: one devoted to enclosure and one to display. As the enclosure cabinet is opened, it begins to alter the space of the barge. Cabinet doors pull out to become walls that frame views and hint at the separation between barge and river. Moving a cabinet also unfolds the roof, and as the door opens, the sky is screened out. Tables fold down from the interior of the cabinet, creating space for lab experiments. It is an omni-customizable ‘magic box.’ All the boundary you need, ready to be unfurled.

A transparent display cabinet faces this ‘enclosure cabinet’ and modulates views without closing them entirely, allowing stored maps and aquaria to become part of the view and the lesson. The display cabinet contains built-in activity stations and seating that unfolds as needed. When students are finished, their newly created and found artifacts become treasures stored in the cabinet as well. The lesson builds with time, each group of students adding a trace of their experience to the barge so that it becomes richer and more complex with each visit.
In this way, the barge becomes the lesson. Small changes in enclosure, whether a space is in shade or sheltered from the wind, will have great consequences for the quality of the surroundings. This is tied to the notion of the interconnectedness of river, sky, and inhabitant. When the deck is at its most open, the cabinets are closed and inaccessible, and when the deck is most enclosed, all of the cabinets become available for use. Open and closed have inverted their normal relation.

This is tied to the wetland as well. When moored, the interior of the barge is flooded, settling it in the water. Cuts through the sides of the barge allow water to flood through the wetland, reconnecting it to the river. The wetland is less something contained, than the filter that permits river water to pass through the barge. The river has as great a role to play in the barge’s occupation, as the students do in creating the enclosure.

Rather than a place to simply sit and be lectured to about the river, the Learning Barge is a mutable object to be engaged with wonder. Like the river, it is intimately tied in to its surroundings, responding to every change in pressure, light, and wind. Also like the river, the inhabitants provide the final piece, imbuing the surface of the barge with meaning through transformation. It is less a place and more an experience.