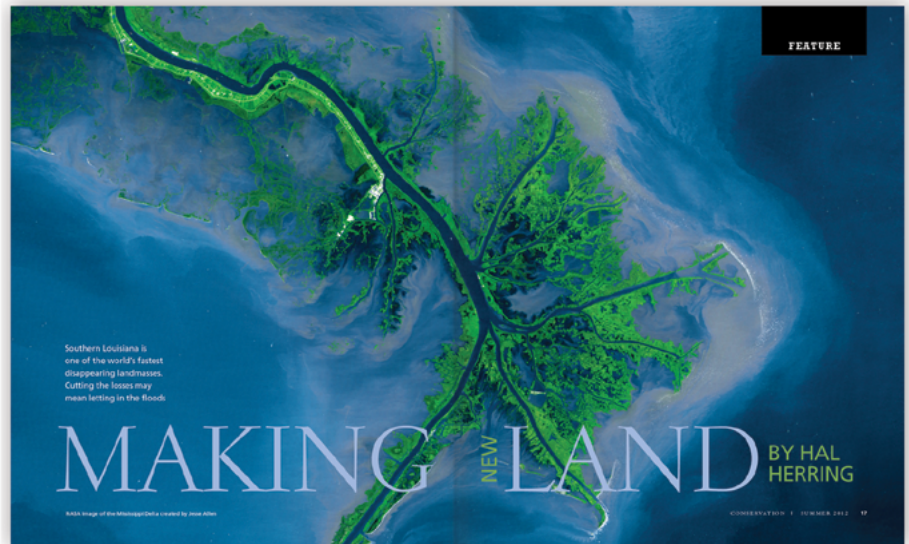


Conservation Classroom Resources

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“ It took the Mississippi River about 7,000 years to build coastal Louisiana. It took just a century of engineering to lose about one-third of it. ”



Making Land

BY HAL HERRING

Southern Louisiana is one of the world's fastest-disappearing landmasses. Cutting the losses may mean letting in the floods.

SUMMARY QUESTIONS

[worksheet available online](#)

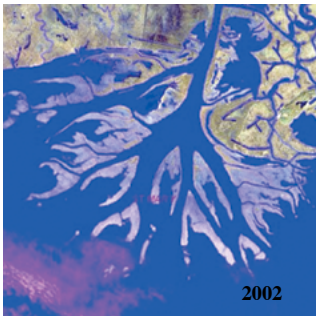
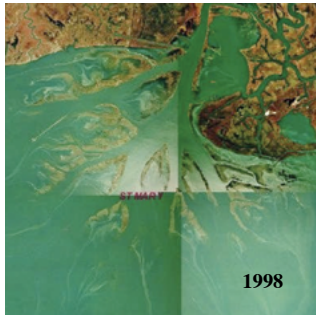
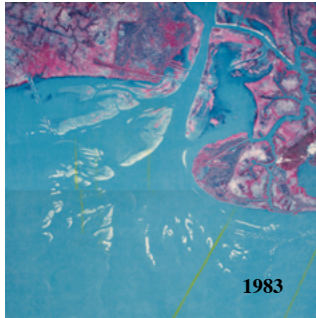
1. What is causing the loss of land in Louisiana? (answer: Dikes and levees, designed to contain floods, block the flow of sediment.) What is the rate of land loss? (answer: Each year, 44 square km of marshland becomes open water, barrier islands recede by an average of 20 meters.)
2. What are some of the possible economic consequences of losing land in the Gulf Coast? (answer: 40% of America's seafood harvest comes from there, human communities lose land, cargo infrastructure lost.)
3. Who are the two sides arguing over whether sediment is a problem or a solution? (answer: 1. Shipping industry which views sediment as a problem – they need to spend lots of money to dredge shipping canals and moving the sediment out to the ocean. 2. Wetland scientists who think sediment is the solution to vanishing marshlands.)

What's Inside:

Summary Questions
Discussion Questions
Advanced Activities
Build Your Own Glossary



Gaining ground in the Wax Lake Delta



Satellite images courtesy of Louisiana Department of Wildlife and Fisheries

4. Describe the recovery of the mangroves in Colombia. What was the situation, what restoration actions took place, and what were the results? (answer: Salt water had invaded the fresh-water zones to the point of wide-spread mangrove death. The levees were taken down, allowing the river to occupy part of the floodplain again, the mangroves immediately recovered.)
5. What are the three restoration activities that Twilley suggests and how would they help? (answer: 1. More spillways such as the Bonnet Carré to bring sediment downstream during floods, 2. move the main navigation channel away from the deep-sea trench so that we don't lose the sediment, and 3. Move the excess sediment in the west over to the east.)

DISCUSSION QUESTIONS

[worksheet available online](#)

1. Discuss the two sides of the argument over whether sediment is a good thing or a problem. What economic considerations come into play? Who benefits from each management approach? Are there other considerations that should be on the table (e.g. indirect benefits, future risk mitigation)?
2. What is your reaction to: "It took the Mississippi River 7,000 years to build coastal Louisiana. It took just a century of engineering to lose about one-third of it." How about: "In essence, taxpayers are paying to hasten the Delta's demise."
3. Examine maps of the region (start with the Land Loss Map within the story). Where is there too much sediment? Where is there too little? Where would the three solutions proposed by Twilley take place, and how would the land be shifted?
4. Who are the two major entities that would enact Twilley's recommendations? Why are they hesitant to do so? What incentives and risks are they balancing?
5. Read the update on the RESTORE Act from the "More to the Story" link. Find out the status of the plans (*starting place: restorethegulf.gov*). What restoration activities (if any) are going to be enacted specifically for land restoration? Where will they take place and who will carry them out? What kind of science should be done over the course of these projects?
6. What is your reaction to the reader's comments at the bottom of the article online? Do you think we are entering a new era of more 'enlightened' decision-making in terms of evaluating our environmental impacts? We have seen many examples of restoration attempts go wrong (e.g. introduction of the mongoose

“The dredging needed to keep open Southwest Pass, a key 45-foot-deep channel, now costs the U.S. Army Corps of Engineers and its allies between \$80 million and \$100 million per year.”

BUILD YOUR OWN GLOSSARY

- ▶ subsidence
- ▶ river levees
- ▶ ecosystem restoration
- ▶ ecosystem services

on Hawaii to take out a different invasive species). Are we learning from our mistakes? Should we more strictly to a “first, do no harm” approach to ecosystem engineering or restoration, or should we try to “right our wrongs”?

ADVANCED ACTIVITIES

- 1. Sociobiology of a Discounted Future:** An article in *National Geographic* (1897) stated that “the great benefit to the present and two or three following generations” of the levees “far outweighs the disadvantages to future generations.” This statement highlights an underlying psychological and sociological concept where humans discount the future. Explore the underlying concepts of sociobiology behind discounting the future. How can conservation scientist recognize and move past this issue? (Side Project: Relate this activity to the “EcoPerception Gap” from the Fall 2012 issue – discounting risks in the future.)
- 2. Geography of Shifting Sediments:** In some cases, the author describes the creation of canals as a positive influence on delta land formation, but in other cases the maintenance of canals seems detrimental. In some cases we’re seeing too much sediment, and in other cases too little. Does it depend on who you’re talking to? Or are there geographic places where sediment has backed up and is scarce in others? (Check out the dam removal project on the Elwha River in Olympic National Park: <http://www.nps.gov/olymp/naturescience/elwha-ecosystem-restoration.htm>) What are the topographic, hydrologic, or engineered characteristics of those locations? Build a working model of what this looks like. (Side Project: Take your model to a local elementary school and design an in-class activity around it for K-12 education.)
- 3. Ecosystem Services of Wetlands:** Why should we worry about saving wetlands in the first place? Twilley says himself that “[Restoration] is such a nice word, and it makes people feel like there’s something in it for everybody. But what it really means is the restoration of ecosystem services, and there are winners and losers in that.” What are the benefits to restoration? What are the downsides? Who are the winners and losers in this scenario? (Side Project: Relate the flood-risk resulting from delta restoration to “What Tragedy? Whose Commons?” in the Fall 2012 issue. Hints: who benefits from removing the levees etc? Do the restoration activities create a threat to certain stakeholders?)
- 4. Mapping Site-Specific Management Options:** Twilley proposed to move the main shipping canal of the Mississippi. Find out where he proposed to move it. Map it out. Where are the options, what are the costs and benefits to each site?