Case studies provide in-depth lessons about sustainability

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gala

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Yifan He, Juan Pablo Baldíviezo, Arun Agrawal, et al.

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What is the role for science in community forestry in Nepal?

Rebecca Rutt and Meghan Wagner

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How could policies in the early 20th century have shaped more sustainable transportation systems?

Éamonn Fetherston, Michael Kinzler, and Shelie Miller

Reclaiming Wood, Lives, and Communities

How do we turn a waste stream into an asset that revitalizes cities?

Sarah Hines, Neha Srinivasan, Lauren Marshall, et al.

The Cost of Sustainable Palm Oil

Should an Indonesian smallholder farmer get RSPO certified?

Erich Eberhard, Elizabeth Oliphant, and Adam Simon

The All-Too-Common Reed

How can an urban wildlife refuge sustainably manage the invasive reed Phragmites?

Sheila Schueller, Hayley Currier, and Dan Tanner

SITE LOCATIONS

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NATURAL RESOURCES

Water

Materials

Energy

Land

Biosphere

GLOBAL SYSTEMS

FOOD

CLIMATE

HEALTH

KEYWORDS

A
Adaptation
Agriculture

B
Boulder

C
Climate Change
Colorado
Composting
Conservation
Cost-Benefit Analysis
Cradle To Grave

G
Gadchiroli
Gestion Des Risques

E
Economics
Equity
Erosion

F
Forests

I
Indigenous People
Industrie
Industry
Infrastructure

L
La Pollution
Land Rights
Land-Use

M
Marine

N
Nuclear

P
Philanthropy
Political Economy
Pollution

R
Recycling
Renewable
Risk Management

S
Supply Chain

T
Transportation

U
Urban

W
Waste Management
Wildfires

Home Page for Gala, a site that provides open access learning tools for sustainability science. Credit: University of Michigan

"I can't watch these animals go extinct and sit by," Josh, general manager of Mugie Conservancy said in an interview about the problem of poaching other animals, usually for profit. This after he received a call about a dead elephant in the protected area in Kenya.

"The vacant buildings are both a symptom of things that are wrong with our city, in terms of justice and equity, but they're also a perpetrator of things because they harbor filth and crime," Jeff Carroll of Humanim and partners said in a video describing a project to create local jobs repurposing wood from some of the 60,000 homes in Baltimore that are scheduled to be removed.

From how Traverse City, Michigan cherry farmers are adapting to ever-changing climate that is hurting their industry, to how Indonesians are balancing deforestation with the demands of a lucrative palm oil industry, students across the university are stepping into the role of decision-makers to learn environmental science and sustainability in a new way.

They, along with faculty and external professional or alumni partners, are building thorough, thoughtful case studies, presented online with historical and contemporary narratives, enhanced with multimedia such as audio features, maps, photos and videos.

The Third Century Initiative-funded effort that encourages those who teach about the environment to develop their own online cases is led by Rebecca Hardin, associate professor, School for Environment and

Sustainability and director Michigan Sustainability Cases (MSC) initiative.

The $25 million, five-year Third Century Initiative was established in advance of U-M's 2017 Bicentennial to develop innovative, multi-disciplinary teaching and scholarship approaches that would take the university into its next century. The initiative awarded grants in various increments, including more than a million dollars over four years for MSC, which prompted the team to build not only the modules or cases, but also the open-access software platform for use by learners on campus and beyond.

The cases allow students to work with professors and practitioners to explore topics in great depth, bringing together material from traditional sources like textbooks and research articles, as well as local and global first-person sources.

"These are told as a real story, emboldened with good scenes, each one focused on a topic or question," said Edward Waisanen, multimedia projects manager for Michigan Sustainability Cases, who is one of the website-based tool creators.

The issues can be global or local, like the Ann Arbor Dioxane Plume pollution case which Meg Czerwinski, a doctoral candidate in the UM School of Nursing, used as an intervention with students in her dissertation research on sustainability education in medical fields.

The case study, written by Anna Prushinskaya and deployed by Czerwinski, begins at the rental home of a family living near the plume. A knock on the door comes one day from someone who informs them they have been exposed to the chemical at higher rates than the Environmental Protection Agency recommended, even though the dioxane level in the water they had consumed for two years was in line

with Michigan standards. The case study unfolds through the eyes of this household, and tells about the discovery of the chemical, its origin, and the debate about what are safe levels and what action should be taken.

"I had students read through everything they could find. I was able to pull up videos of past town hall meetings. So, for our case study we decided to do a mock town hall," Czerwinski said.

Her study will provide key data for integrating sustainability into medical care curricula for young professionals.

In a history class, student William Wright wrote a case study about the creation of Indian reservations in the late American West.

"After years of war, the U.S. government and several Sioux tribes negotiated the Fort Laramie Treaty, which established a massive plot of land allocated entirely to the Sioux tribes. However, U.S. miners soon discovered gold in the hills of that land, and immediately flooded the region, disregarding the treaty and the land," Wright said.

"I think creating something like this forces you to view the case in a more holistic way than a more traditional paper would. Also, using the multimedia aspects of the website allowed me to consider and use sources that I normally would have passed over."

Hardin leads the initiative to spur this new way of teaching but she is quick to acknowledge other colleagues like Arun Agrawal, who paved the way with projects that encouraged students to work with clients to solve sustainability challenges, and one who used a case study model for the controversy around hunting wolves in Michigan.

"The cases are so valuable in providing rapid immersion in an area that urgently needs this kind of exposure and is underrepresented in

academic literature," Hardin said.

Hardin recruited graduating computer science student Cameron Bothner (now a developer with Shopify, in Montreal) who worked with SEAS graduates Pearl Zhu Zeng (now a developer with Sift, in Detroit) and Waisanen. Together with Meghan Wagner (an alumna from U-M EES) and Hardin, and with input from SEAS and EES faculty, they created the web-based environment called "Gala." Gala–so named because it is a favorite Michigan apple variety but also means a party or gathering to celebrate a cause–enables teams to easily build cases online, complete with original or curated multimedia resources and links to other relevant materials.

To date, more than 100 cases have been created, some with funding and guidance from the MSC team, others by various platform users. All are searchable on the platform by the geographical setting of the case, or by themes such as water, materials, energy, land, biosphere, food, climate and health.

It's not just University of Michigan students and Ann Arbor residents using the Gala resources. An alumna of SEAS working with the USDA co-wrote a case about the effort to reclaim wood from abandoned houses. Sarah Hines, science delivery specialist at the USDA Baltimore Field Station, and representatives from Humanim and the city of Baltimore hope the case will inspire other communities to think about sustainability as an economic driver.

That's what gets Hardin excited about the studies—the opportunity to have them be used throughout campus and beyond.

Right now, the cases are being studied in cross-disciplinary courses involving several U-M units, including SEAS, Nursing, Public Health, Public Policy, Engineering and Literature, Science and the Arts, and a

few outside organizations, mostly through alumni connections.

Hardin wants this model to become a standard for teaching lifelong learners as well as current students about the environment.

Graduate student Peter Sicilano had the opportunity to work on several of the cases in a class on Science.

and Management of the Great Lakes. In one study of Western Lake Erie, what he learned went beyond basic research, discovering that issues aren't just about the science, in this case nutrient management.

"That case is as much about a cultural struggle as it is a nutrient issue," Sicilano said of the concern over phosphorus from farm application making its way through the Maumee River to Lake Erie, where it contributes to algae blooms that make water toxic, causing fish to die and potentially impacting human health. "It sounded a lot like policy gymnastics, trying to get a consensus."

Perrin Selcer, associate professor of history and director of the Science, Technology and Society Program, used the case studies in place of a research paper he traditionally had students write in his environmental history seminar, and he believes they internalized much more of the content by doing the cases than they would have by writing a paper.

"The assignment asked students to synthesize scholarship on a well-known development project into a story that represented key lessons from the course," Selcer wrote in a blog post about the experience.

"Rather than a typical conclusion, the case study culminated in the identification of an intrinsic dilemma or fundamental question. This subtle tweak shifted students' roles from under-qualified experts passing judgment to curious educators clarifying complexity. By the end of the

assignment, they understood the stakes of framing a historical problem correctly."

In Selcer's class Ophelia Deng researched the question, "Is the Gardens by the Bay the future for sustainability or the present aesthetic of sustainability?"

"The case with Singapore helped me better understand how these issues could be applicable or manifested in real life rather than just in theories," Deng said. "It felt more like I was constructing a narrative than just restating facts and figures."

Provided by University of Michigan