



Module 6: Across the Urban Rural Gradient

Video Spotlight: Science to Policy: Tracking Emissions & Soil Carbon for Climate-Smart Land Use

Speaker: Francesca Hopkins

Affiliation: Associate Professor, Climate Change & Sustainability, UC Riverside

Summary: Dr. Francesca Hopkins is a climate scientist whose work bridges science, sustainability, and policy. Her research in greenhouse gas emissions and soil carbon storage directly informs how cities and agricultural regions—especially in California—can reduce their climate impact through smarter land use and sustainable practices.

Website:

<https://francescamhopkins.org/> Initiative

Speaker Background:

Dr. Francesca Hopkins is an Associate Professor of Climate Change & Sustainability at UC Riverside. She leads the Greenhouse Gas Emissions Lab, which uses satellite, airborne, and ground-level tools to track methane, carbon dioxide, and other emissions across cities, farms, and industrial areas. Her research focuses on how carbon moves through ecosystems and how climate policy can target major sources of emissions.

She brings experience from major research fellowships at NASA and NSF, and she actively engages in science communication and advising policymakers on climate solutions at local and state levels.

Social Impact:

Dr. Hopkins' work plays a critical role in helping communities understand and act on the sources of greenhouse gas emissions. Her contributions to urban methane mapping, soil carbon research, and emission monitoring technologies support more accurate climate planning and inspire sustainable development policies in both urban and rural areas.



Student notes/reflections:



Primary Reflection Prompt

Dr. Francesca Hopkins' work focuses on tracking greenhouse gas emissions and soil carbon storage to guide smarter land-use and climate policy. In Module 6, we learned how farming systems differ across the **urban–peri-urban–rural gradient**, each with unique trade-offs in land, labor, and emissions.

How does Dr. Hopkins' research on emissions connect to the sustainability challenges of one zone (urban, peri-urban, or rural), and how could climate-smart practices from Module 6 help reduce emissions and improve resilience? Provide one concrete example to explain your thinking.

Alternative Prompts

1. Systems Lens Connection

Module 6 showed how circular systems—like compost-heated greenhouses or renewable-powered irrigation—can cut waste and emissions. How could Dr. Hopkins' research on carbon cycles help identify or measure the success of these loops? Choose one example from the gradient and explain.

2. Case Study Link

One case study highlighted closed-loop urban micro-farms that recycle food waste into mushrooms, compost, and greens. How might Dr. Hopkins' work on greenhouse gas monitoring support scaling up this type of system in other cities? What benefits and challenges do you see?

3. Personal Action Lens

Dr. Hopkins connects science with policy to address emissions. If you were part of her research team, what project would you propose for your community's food system (urban, peri-urban, or rural)? Describe your idea, the loop it would close, and how tracking emissions could help prove its impact.

Speaker Info