The Importance of Soil Health In Urban And Peri-urban Settings

Anna Paltseva, PhD
Clinical Assistant Professor
Departments of Agronomy | Horticulture & Landscape Architecture
Purdue University, USA

GLOBAL SYMPOSIUM ON SOIL SEALING AND URBAN SOILS

Healthy soils for healthy cities

PURDUE UNIVERSITY
College of Agriculture

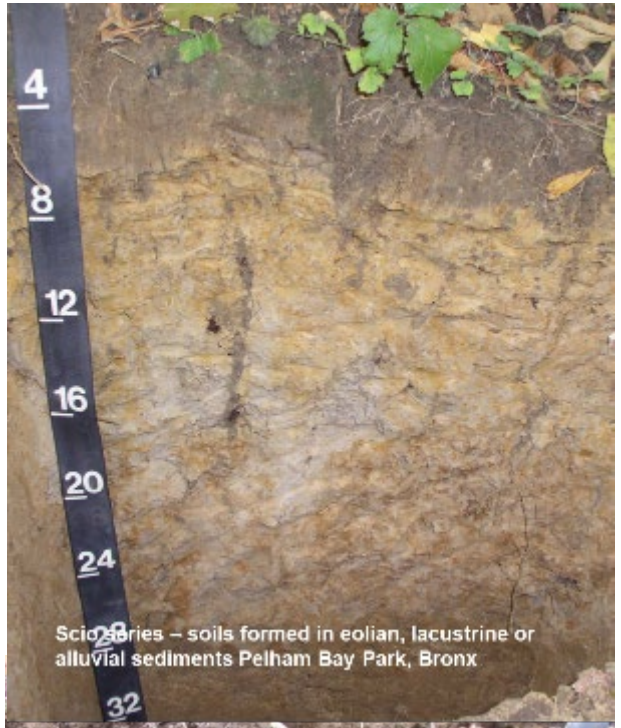
Urban soils:

- High heterogeneity
- Modified temperatures
- Artifacts in soil profiles
- Limited soil resource

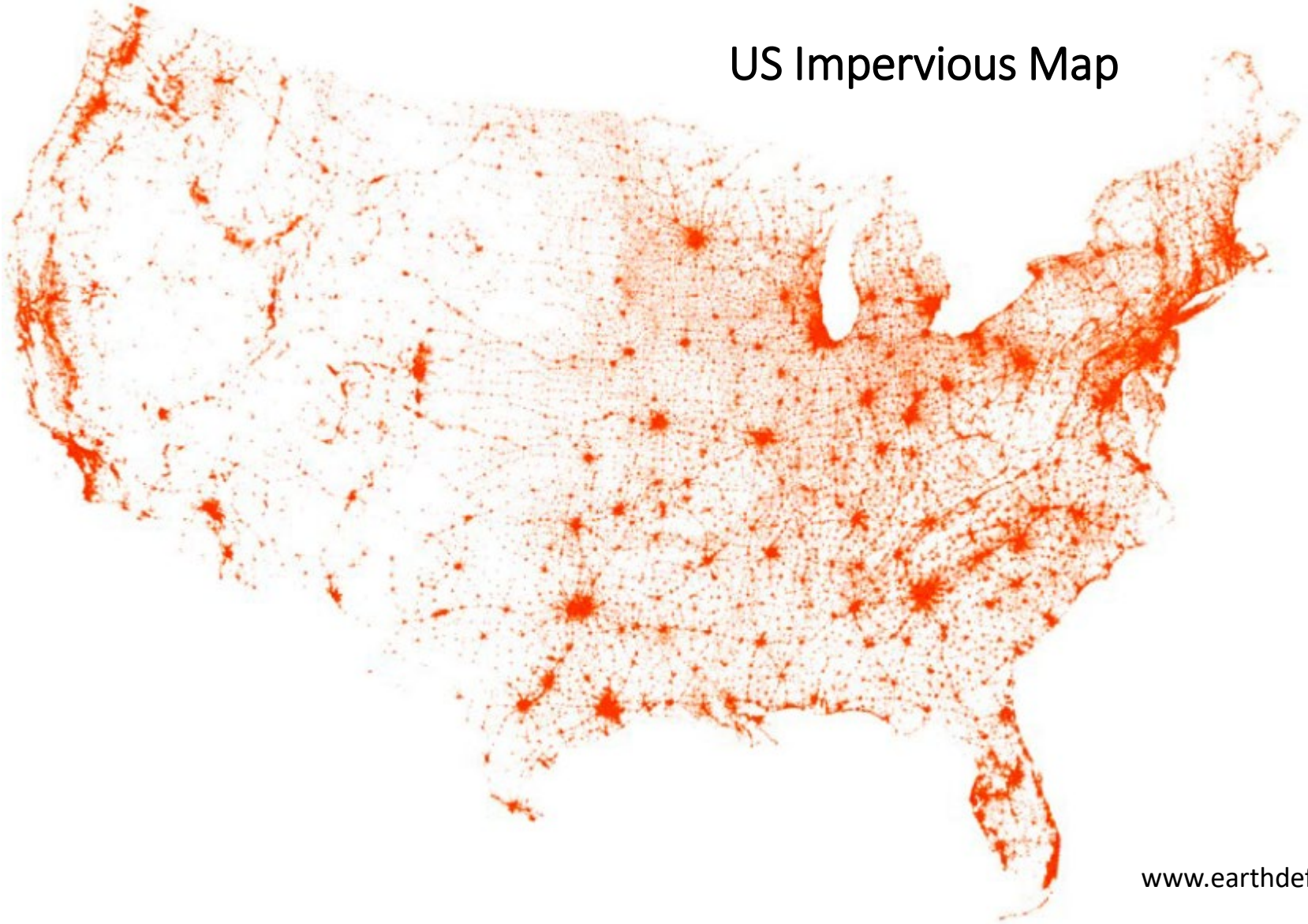
New York City

Urban Soils of New York City

- human-altered
- often contaminated
- but full of potential



~ 83% of the US population resides in urban areas



www.earthdefine.com

What Happens When We Don’t Protect Urban Soils

Soil sealing blocks rain infiltration, causing rapid runoff → runoff increases flood risk and water pollution

Over 50% of urban growth replaced forests, transforming natural habitats into urban landscapes

Impervious surfaces raise urban temperatures by 1–3°C vs. rural areas

~ 25% of U.S. residential soils exceed the EPA's new Pb screening level of 200 ppm; in cities like Indianapolis and Chicago, 37% and 53% of soils respectively exceed this level

~ 80% of US cities have peri-urban areas close to intense agriculture using high pesticide volumes without sufficient protective buffer zones, increasing contamination risk

Urban Soil Services

Archaeological artifacts,
Rome, Italy

Education and research,
Brooklyn, NYC, USA

Cultural and aesthetic v
Pyatigorsk, Russia

Food production,
Governor's Island, NYC, USA

Habitat for biodiversity,
Guangzhou, China

Carbon sequestration,
Governor's Island, NYC, USA

Building foundation support,
New York City, USA

Stormwater management,
Chicago, USA

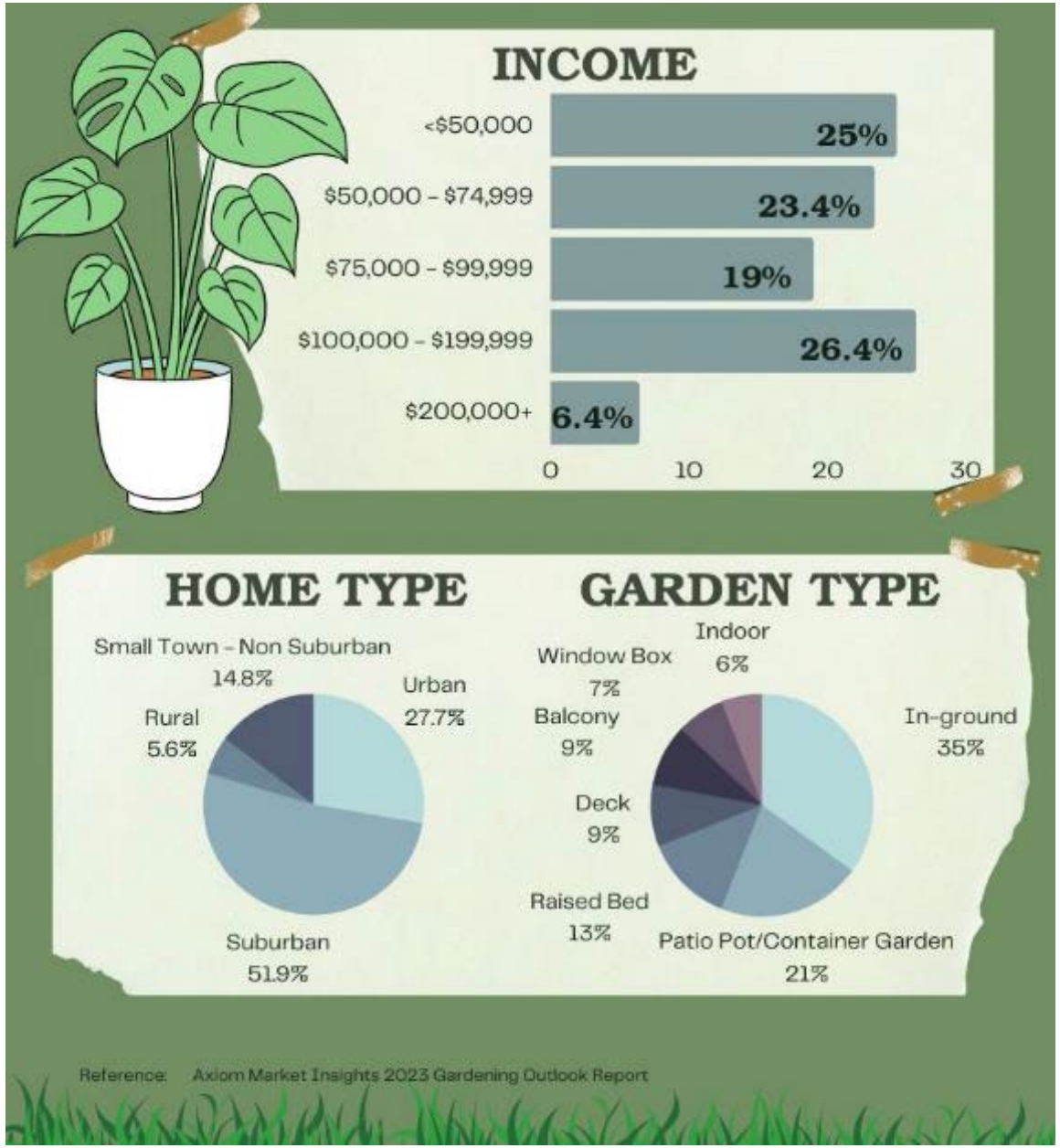
Green spaces,
Lugano, Switzerland

Urban Soil Guide -
Paltseva (2024)

Why do people grow food in cities that have everything in stores?

Urban Garden Trends in the U.S.

- 55% of American households engage in gardening
- Impact of Covid-19 led to 18.3 million new gardeners, mostly millennials.
- Children involved in gardening more likely to eat vegetables.



Top Reasons People Garden in America in 2025

Sources: National Garden Bureau, CNN, Minnesota State Horticultural Society, Garden Media Group, Colorado State University

Key Recommendations for Advancing Participatory Science in Urban Soil Projects

01

Integrate mobile apps, web platforms, and geospatial tools to streamline data collection and engage individuals. Leverage real-time feedback and interactive features to enhance participation.

02

Develop targeted outreach programs to involve underserved and marginalized communities. Partner with local organizations to build trust and ensure inclusivity in urban soil projects.

03

Collaborate with policymakers, urban planners, and environmental advocates to turn participatory science data into actionable policy recommendations. Facilitate workshops and present data to local governments.

04

Partner with schools and educational institutions to integrate soil science into science and geography curricula. Create hands-on activities, projects, and fieldwork that involve students in soil testing and analysis.

05

Establish an open-data platform where individuals can access, share, and analyze soil data. Ensure transparency by making results publicly available and encouraging collaboration between researchers and the public.

06

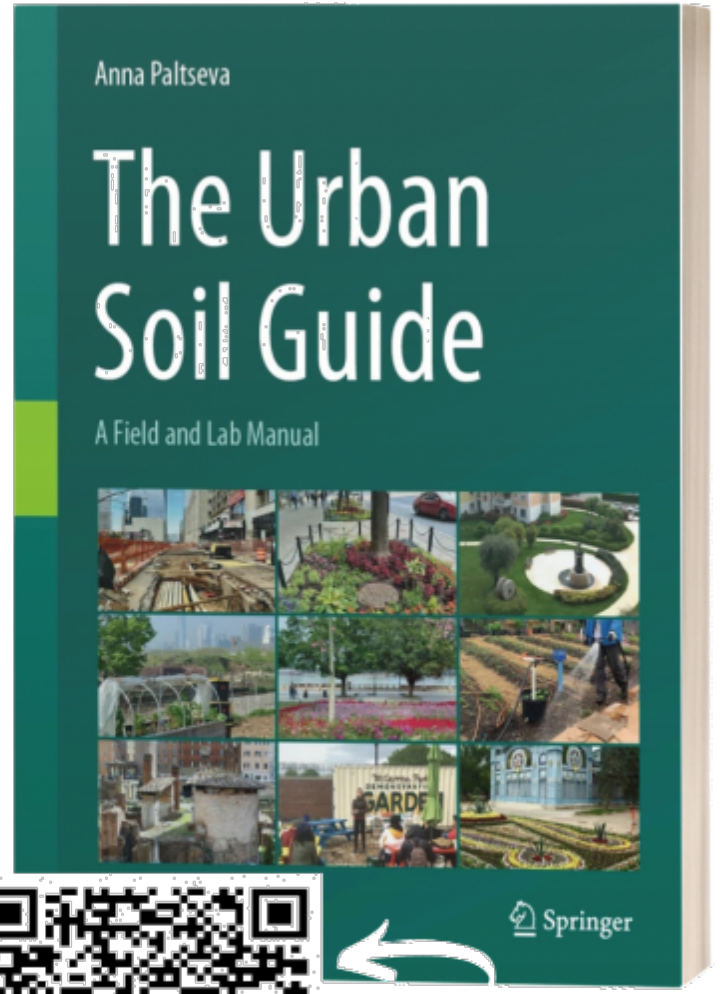
Analyze participant demographics and behavior to tailor engagement strategies. Use data insights to refine messaging, outreach methods, and community involvement to maximize participation.

07

Create gamified elements, challenges, or reward systems to maintain long-term involvement in participatory science projects. Encourage participants to reach milestones and offer recognition for their contributions.

SCAN ME

A Practical Resource for Urban Soil Education and Testing



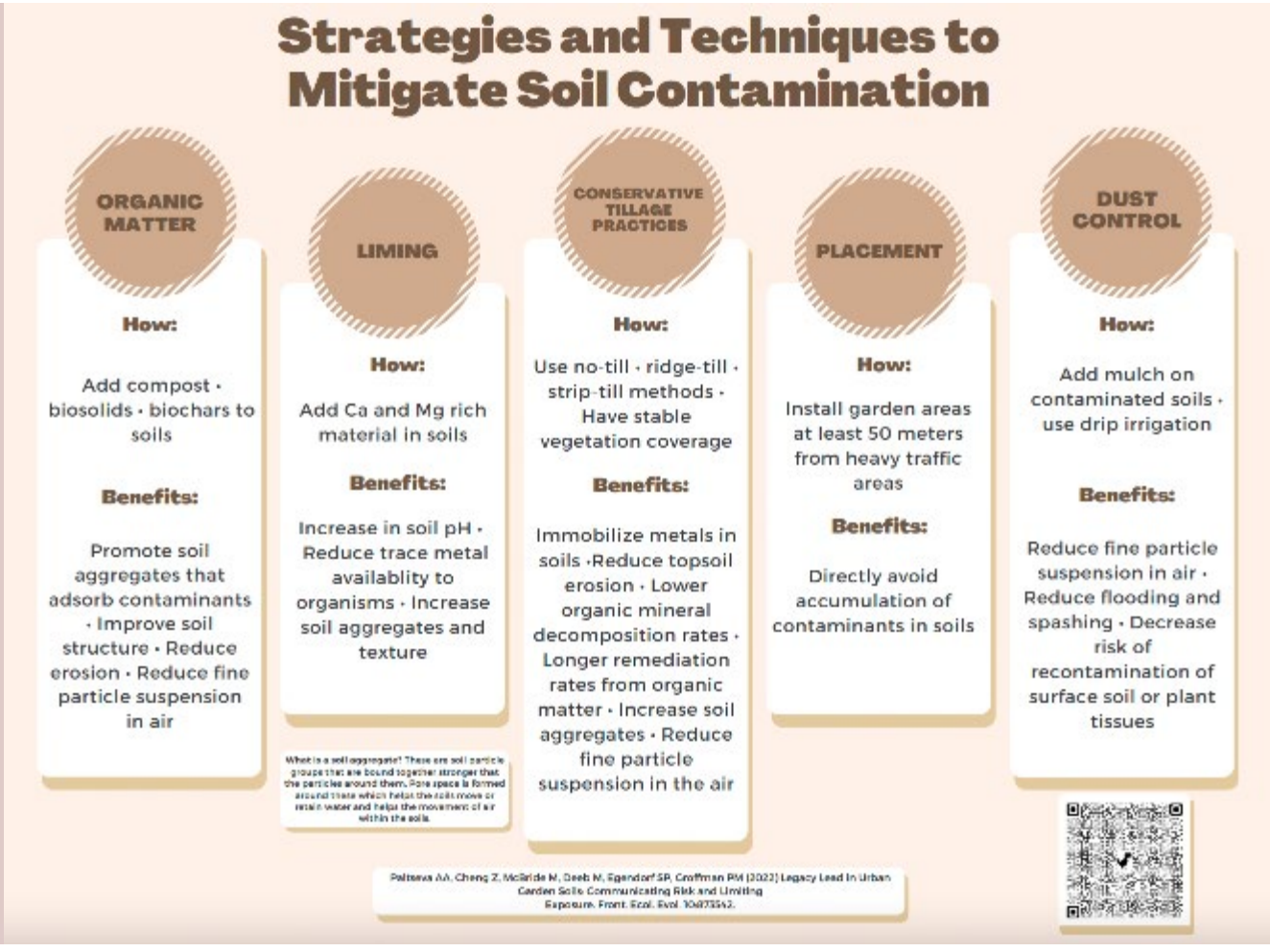
Get Your Copy

The use of attractive graphics and modern, digitally based strategies significantly improved soil education performances

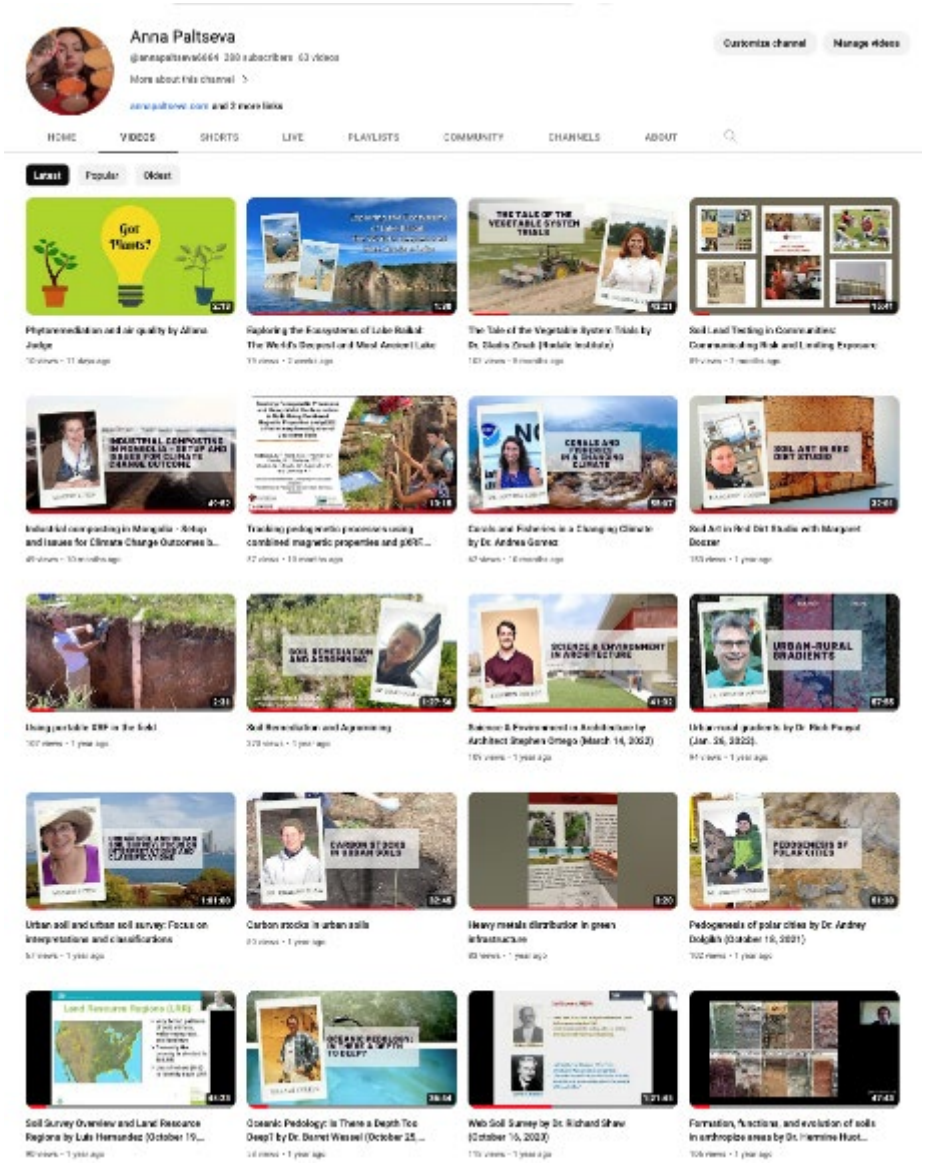
Charzynski et al (2022)

Innovative Tools for Soil Education

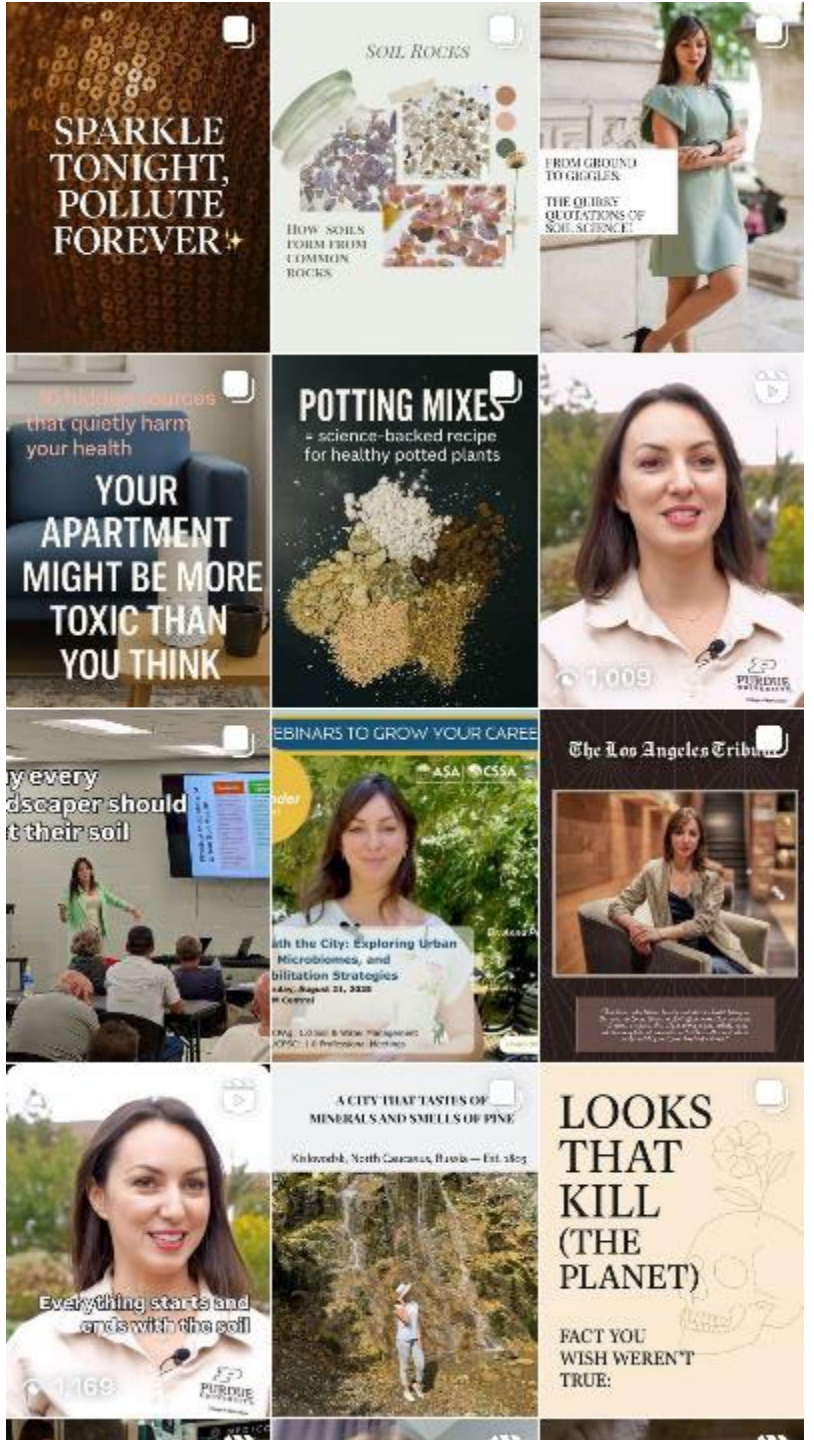
Making Soil Science Accessible, Engaging, and Actionable



Building a Digital Classroom Beyond the University



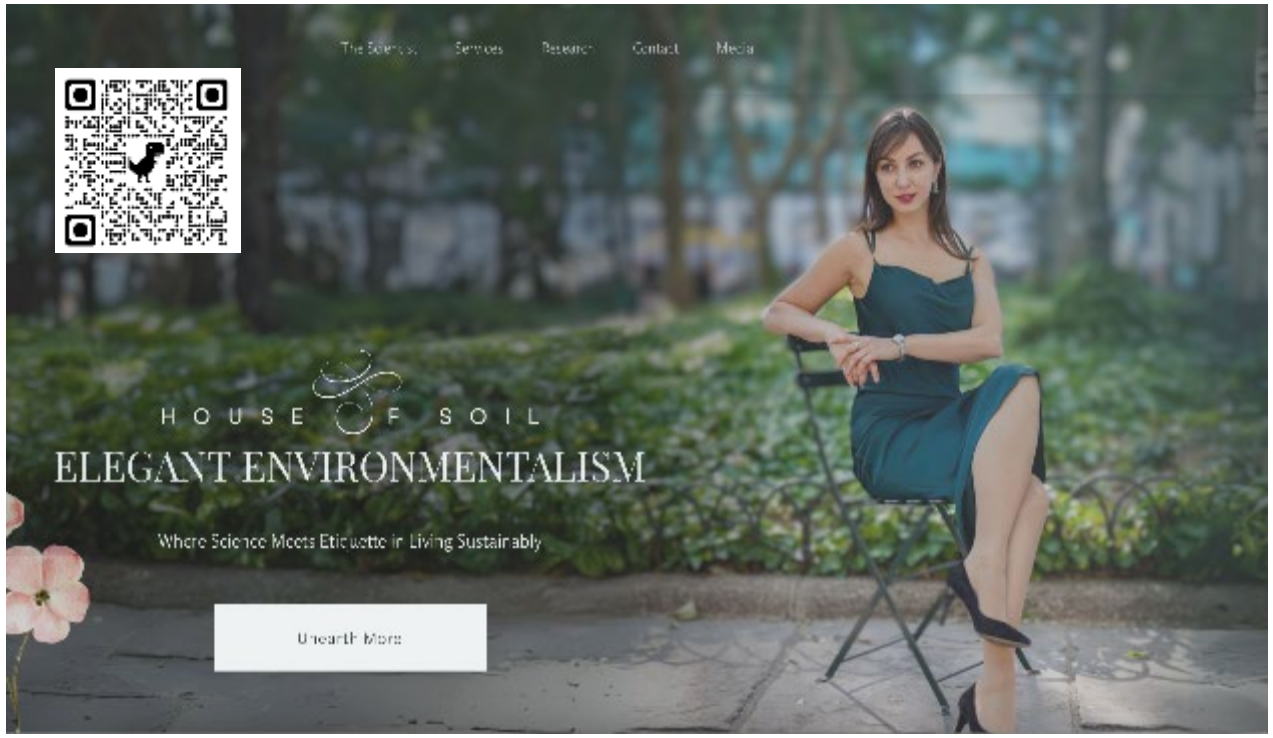
SCAN ME



HOUSE_OF_SOIL

SCAN ME

Bringing Science to Culture



Pathways to Healthier Urban and Peri-urban Soils

Integrate soil into urban planning

Promote unsealing & green infrastructure

Foster soil literacy & participatory science

Bridge science, policy, and citizens

Stay Connected

Email me with any questions

apaltsev@purdue.edu

THANK YOU!

HOUSE_OF_SOIL