iPlan: A Platform for Developing Localized Simulations to Support Interactive Learning about Climate Change

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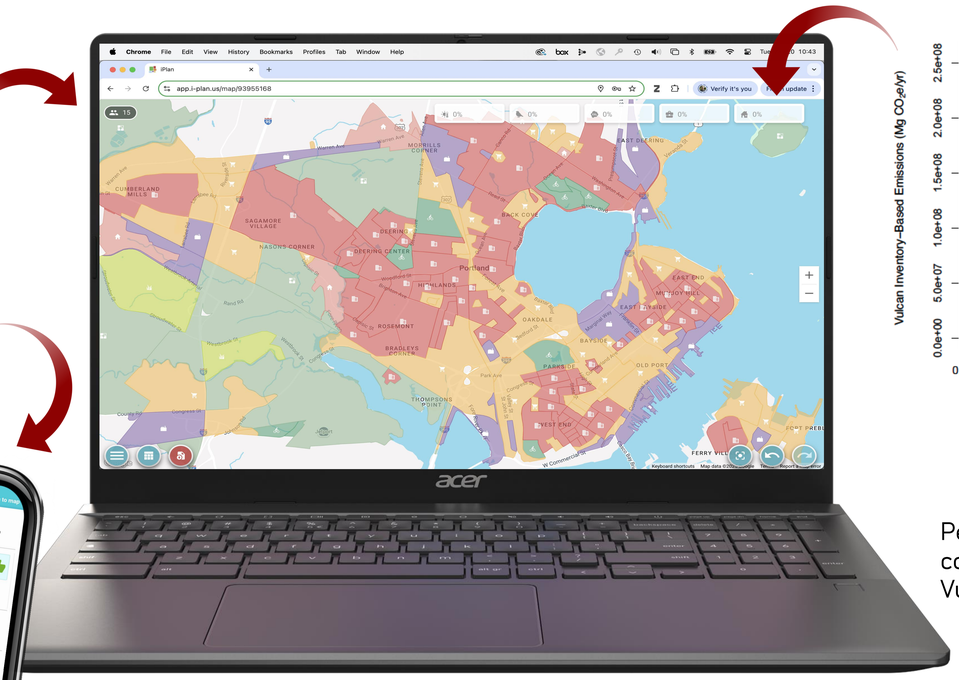
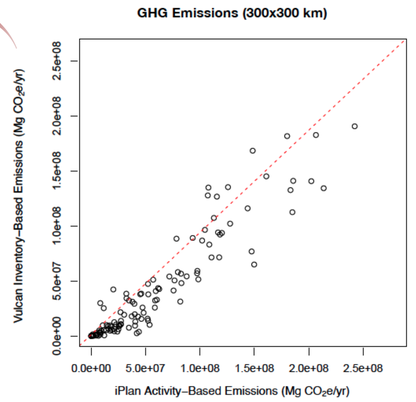
iPlan

iPlan is a free online game where students construct, investigate, and solve simulated socio-environmental problems in their own local contexts.

Students construct zoning plans to address socioeconomic and environmental issues and present them to virtual stakeholders who advocate for different community priorities.





Pearson's r = 0.95 between *iPlan*'s computed GHG emissions and the Vulcan evaluation dataset.

A Pedagogical Approach to Modeling Anthropogenic Greenhouse Gas Emissions

Most GHG inventories compute emissions based on the points of origin. This means that power plants and commercial freight, for example, are major drivers of emissions.

But this supply-side view is less helpful from a learning perspective as it obscures the activities that drive emissions. In *iPlan*, we recomputed GHG emissions on a demand-side basis, reassigning emissions from power plants and shipping to housing, commercial, and industrial land uses. This helps students understand what actually drives GHG emissions, not just where they are emitted.

Accessible

Free, online, and easy to use

Local

Works anywhere in the contiguous United States

Accurate

Actual data, realistic models

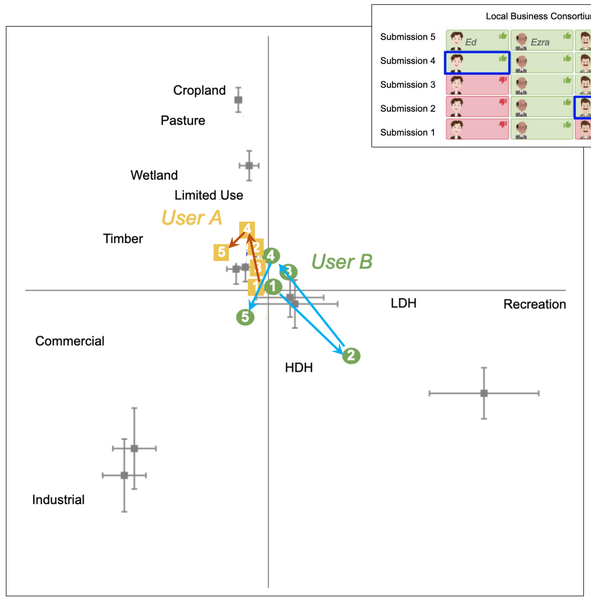
Authentic

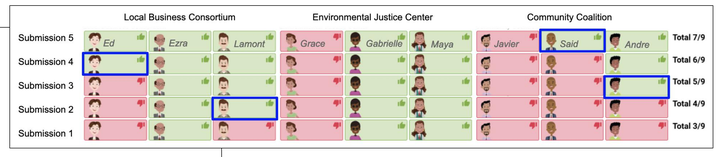
Real-world STEM problem solving

Adaptable

Fits any curriculum and meets NGSS and other standards

"[iPlan] *was easy to use for both me and my students, and allowed each student to engage with the model at their own level. I loved the fact that we could model our community—I have been struggling to find ways to teach about ecological restoration, and its implications at the local level, that shows kids real world applications, and this tool really helped me do that. My students really buy into learning more when the topic at hand relates to where they live, play, and go to school.*" —A High School Science Teacher





Customized Learning, Customized Assessment

Because every *iPlan* simulation is unique, there is no pre-determined "best" solution to the land-use problem. We developed a method for analyzing learning processes that accounts for the unique features of each simulation while accurately modeling learners' approaches to addressing the problem.

Current & Future Work

Current work is expanding *iPlan* in three key ways:

1. ***Climate Change Modeling***. *iPlan* will model land-use changes and land-based adaptations under the anticipated local effects of climate change.
2. ***Land-Based Adaptations***. *iPlan* will model not only land-use change but also land-based adaptations, such as shade tree planting or solar panel installation.
3. ***Adjacency & Asymmetry***. *iPlan* will model more complex effects that account for adjacency and the asymmetric distribution of impacts within a region.

Scan to access *iPlan*, curriculum units, resources, publications, and more!

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