



Biosphere: An App to Inform Individuals of the Human Impact on Biodiversity

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The Big Picture

Biodiversity is declining at an uneasy rate. The rapid decline of biodiversity has extremely negative effects on those who inhabit the Earth. Biodiversity supports ecosystem services include: air and water filtration, renewable energy, and climate regulation

The Madingley model; a 'next-generation' ecosystem and biodiversity model, to view the trajectory of biodiversity change under different scenarios of human development.

The problem we have been tasked to solve is that the Madingley model requires scientific expertise to operate, and uses a large amount of computational power, which is not readily available.

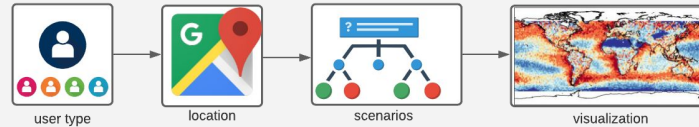
Solution

Develop a progressive web application (PWA) to reach the most user as possible. This application will allow the end user to visualize subsets of a selected scenario generated by the Madingley model.

These subsets will be specified by the user as they walk through the parameter selection progress on the frontend.

Once the data is specified, the heavy lifting is done by the backend to save time and space

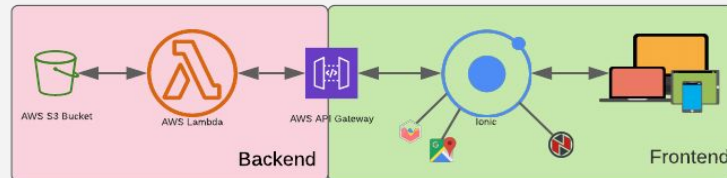
User Architecture



The frontend operates by asking the user three questions to walk them through the steps necessary to request meaningful data from the Madingley model.

- **user type:** *What type of user are you?* This is used to tailored the number of outputs.
- **location:** *What location are you interested in?* This narrows down a location of interest.
- **scenarios:** *What are you interested in?* This allows the user to select a given scenario, and scenario intensity of interest.
- **visualization:** Once the questions are answered, then their unique query will be processed and displayed.

Technical Architecture



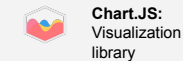
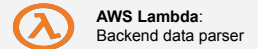
Features

- Global access
- Custom visualizations
- Compatibility almost all devices
- Interactive location selection tools
- Multi-language support

Challenges

- Retrieving data from client
- Data Visualization
- AWS API Gateway Timeout (29sec)
- AWS Lambda Return Size Limit (6MB)

Technologies



Future Work

- Implementation of new scenarios/data
- Additional language support
- New visualization features