

iNatator: Obtaining Expert Feedback on Species Ranges

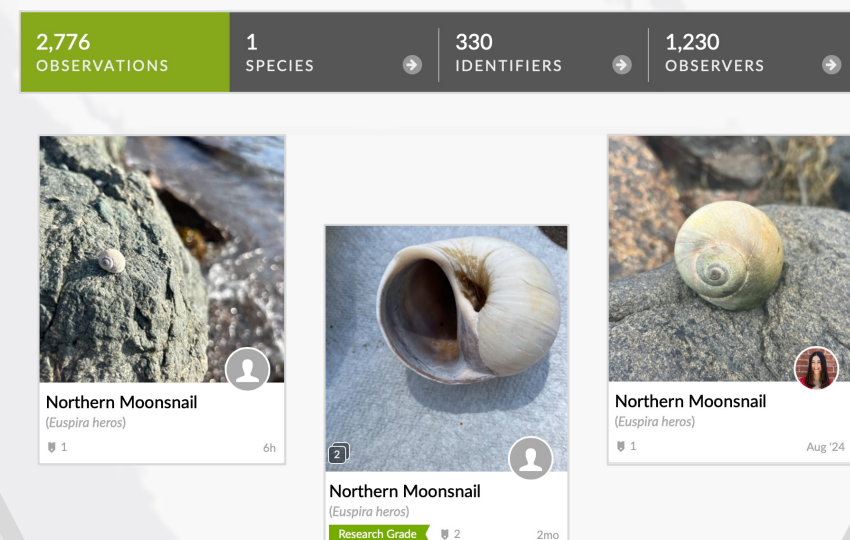
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Motivation

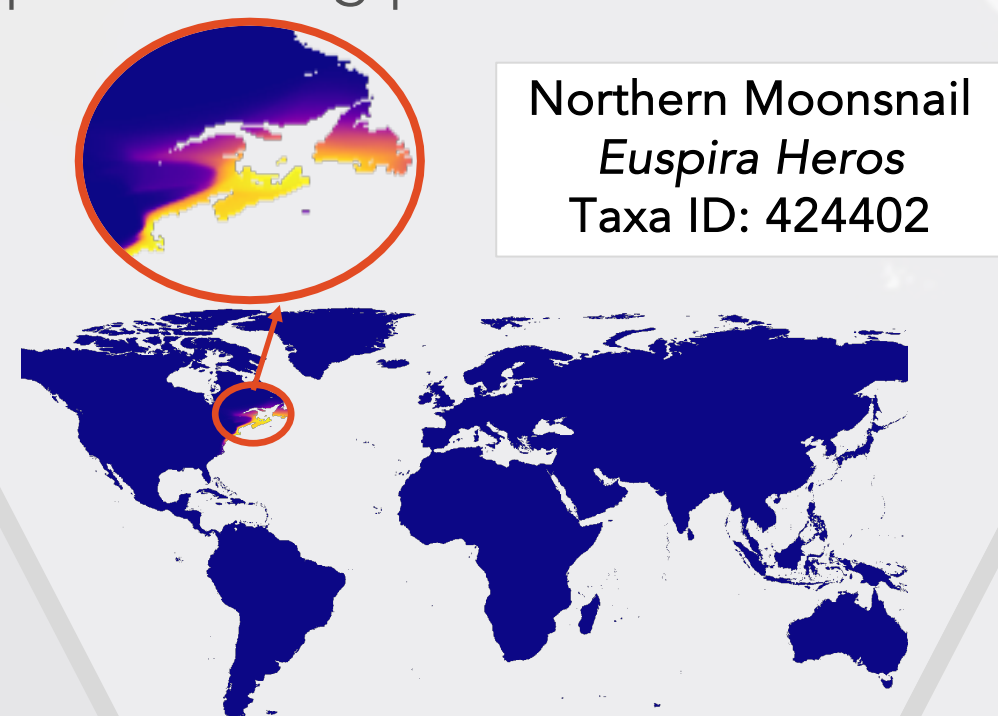
What is iNaturalist?

Social network where people share biodiversity information by posting observations and tagging species

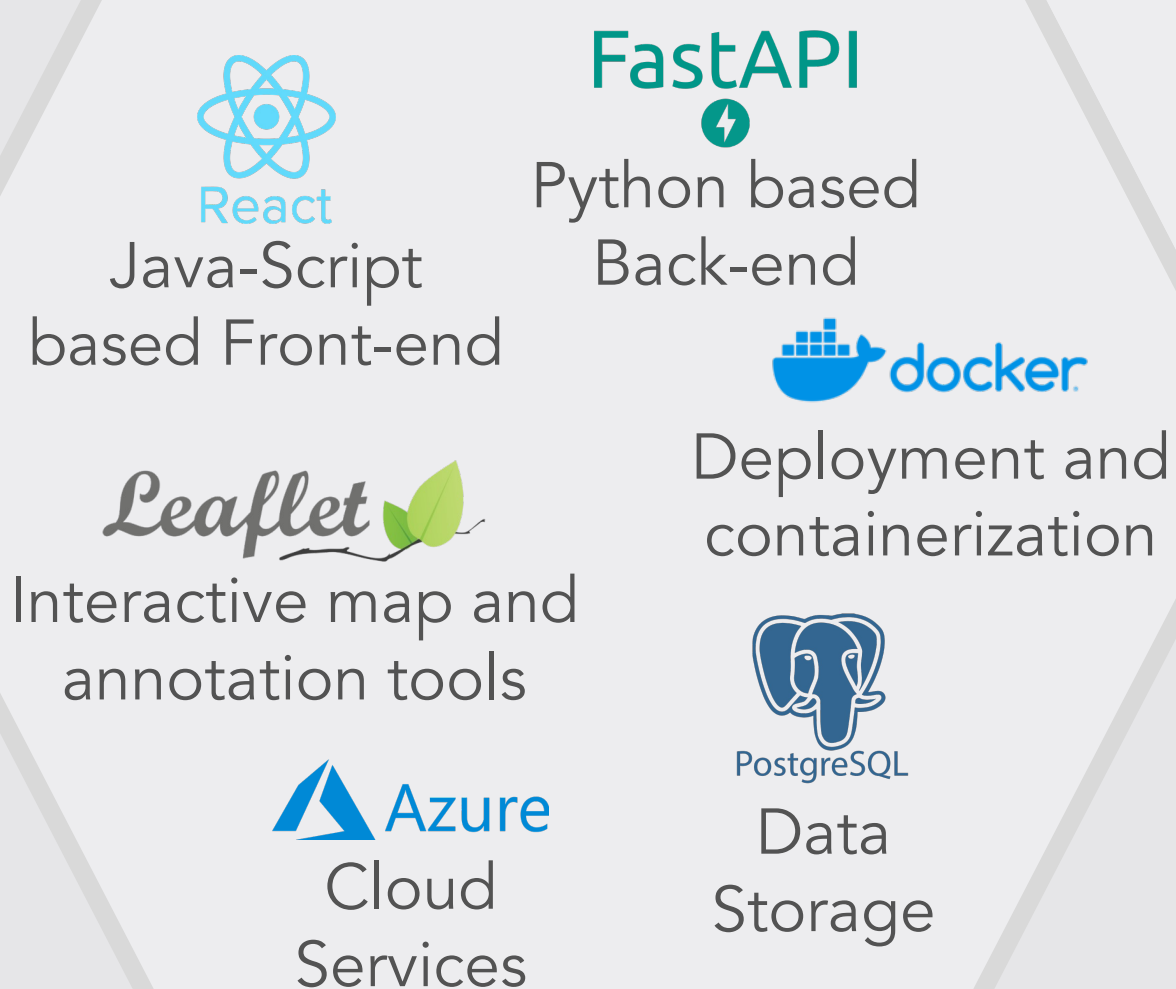


What is the GeoModel?

A neural network ML model trained on iNaturalist observations to predict the likelihood of a species being present at a location^{1, 2}.



Tech-Stack



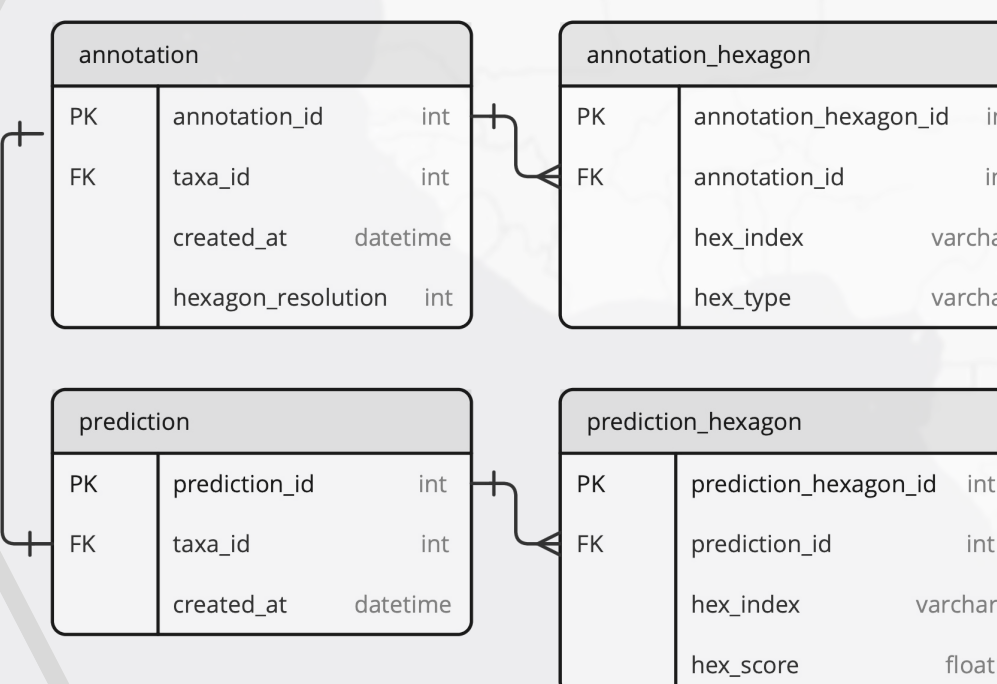
Contribution

We created a platform that allows obtaining expert feedback through annotations of species ranges in an interactive map.

Experts can select **green** hexagons as presence and **red** hexagons as absence in the map, according to their expertise

Database

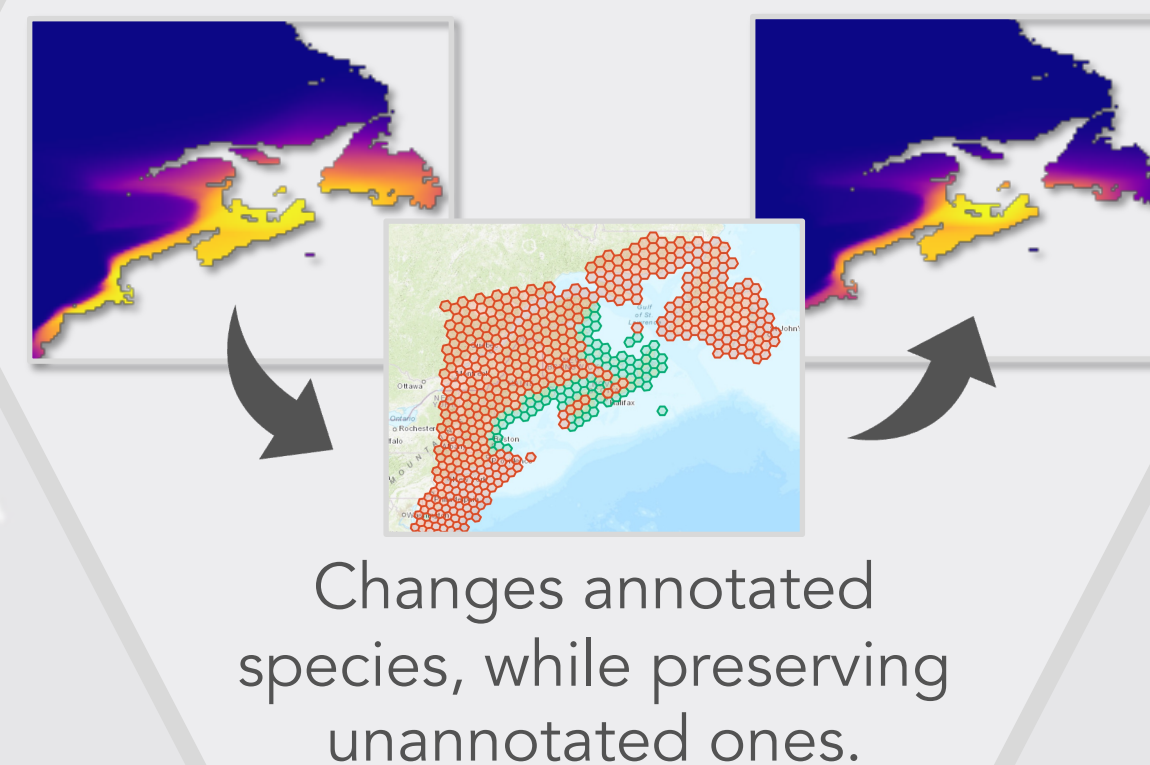
We designed and implemented a database to store annotations...



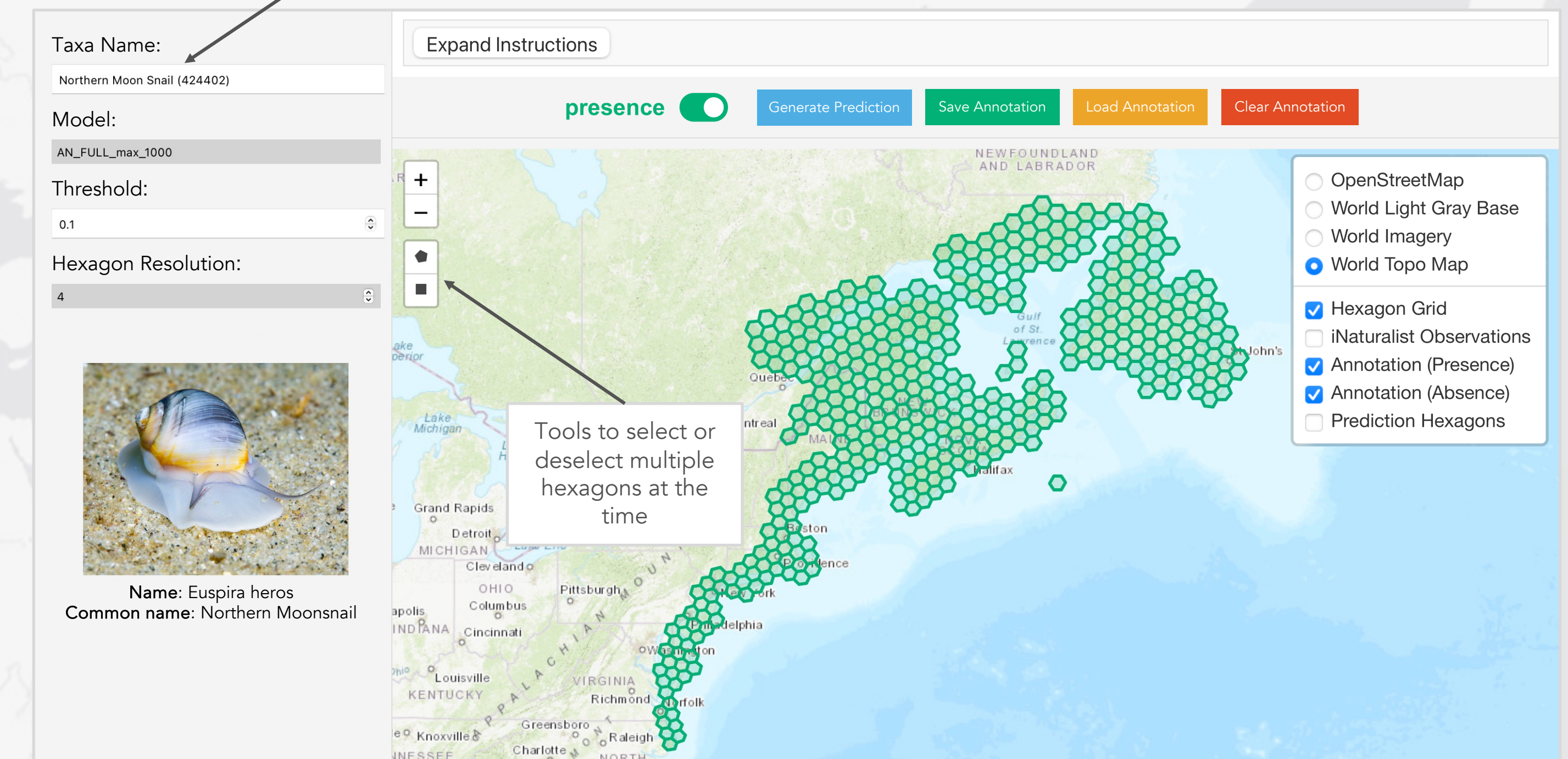
... and precomputed GeoModel predictions

Fine-tuning

Annotations used to fine-tune the model and correct predictions by retraining last layer



- 1 Search species by common name or Taxa ID
- 2 Start annotation from:
Geomodel prediction given a threshold
Previously saved annotation
Empty map
- 3 Annotate by selecting and deselecting presence (**green**) and absence (**red**) hexagons, according to your species range expertise



- 4 Once you finish annotating, **save your progress**



Future Steps

Research Questions

- Retrain all layers when fine-tuning?
- How to weigh annotations when retraining?

Open Questions

- Collaborative living map vs individual annotations.
- Concept of effort, how to annotate.

Future Features

- Mask-off ocean or by height.
- Display multiple species at the same time.

References

- [1] Cole, Elijah, et al. "Spatial implicit neural representations for global-scale species mapping." *International Conference on Machine Learning*. PMLR, 2023.
- [2] Lorie, Scott. (2023, September 21). Introducing the iNaturalist Geomodel [Blog post]. Retrieved from <https://www.inaturalist.org/posts/84677>