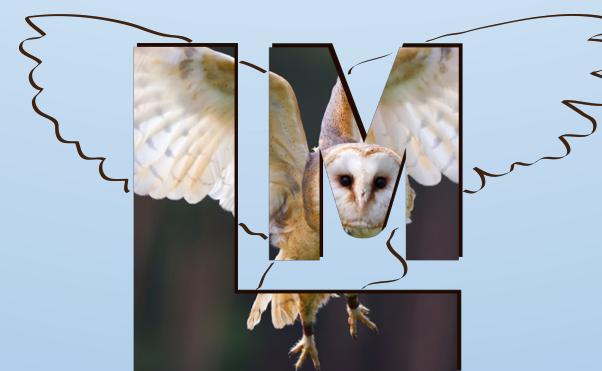
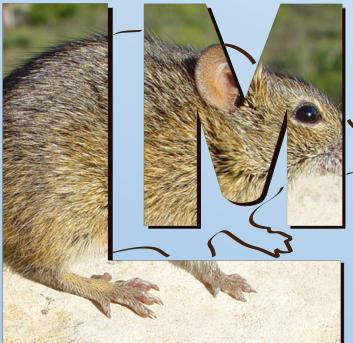
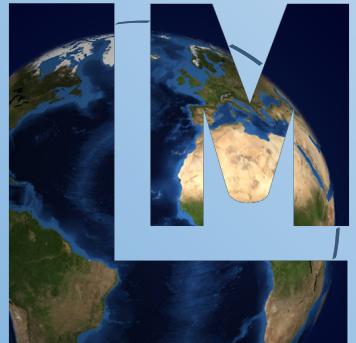


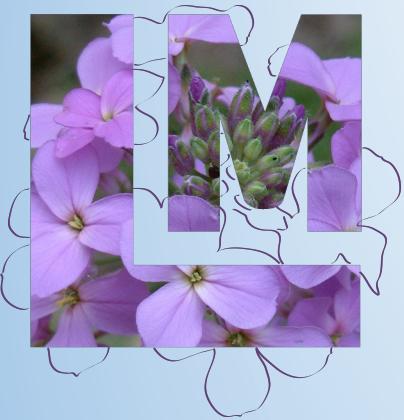


Lifemapper: Visualizing Biodiversity

PRAGMA 36, Jeju, Korea

Aimee Stewart
Biodiversity Institute
University of Kansas, USA





Biodiversity Modeling Software

For Research and Education

- Understand spatial patterns of species diversity and how they emerged
- Address large-scale biodiversity questions of ecological and evolutionary importance

Biological specimen data answers

- What? Where?

Lifemapper works on Why?



Biodiversity Inventory

Biodiversity Modeling

Multi-disciplinary

- Biology, Geography, Geology, Ecology, Evolution

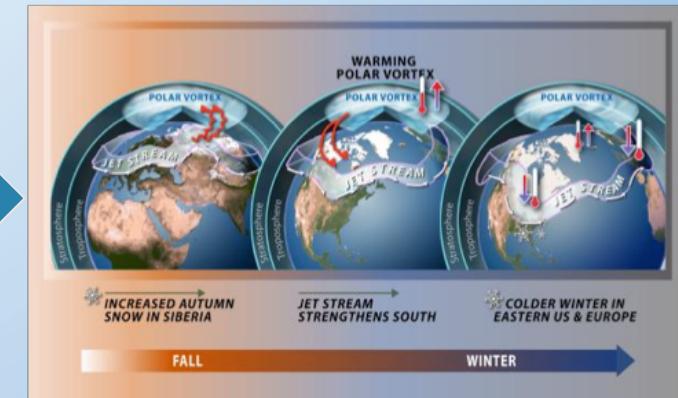
Analyses

- Single-species modeling
- Multi-species analyses
- Phylogenetic and biogeographic analyses

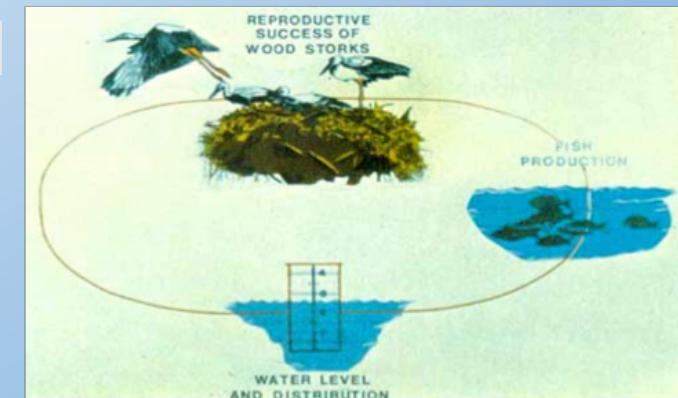
Lifemapper brings together



Global Climate Change



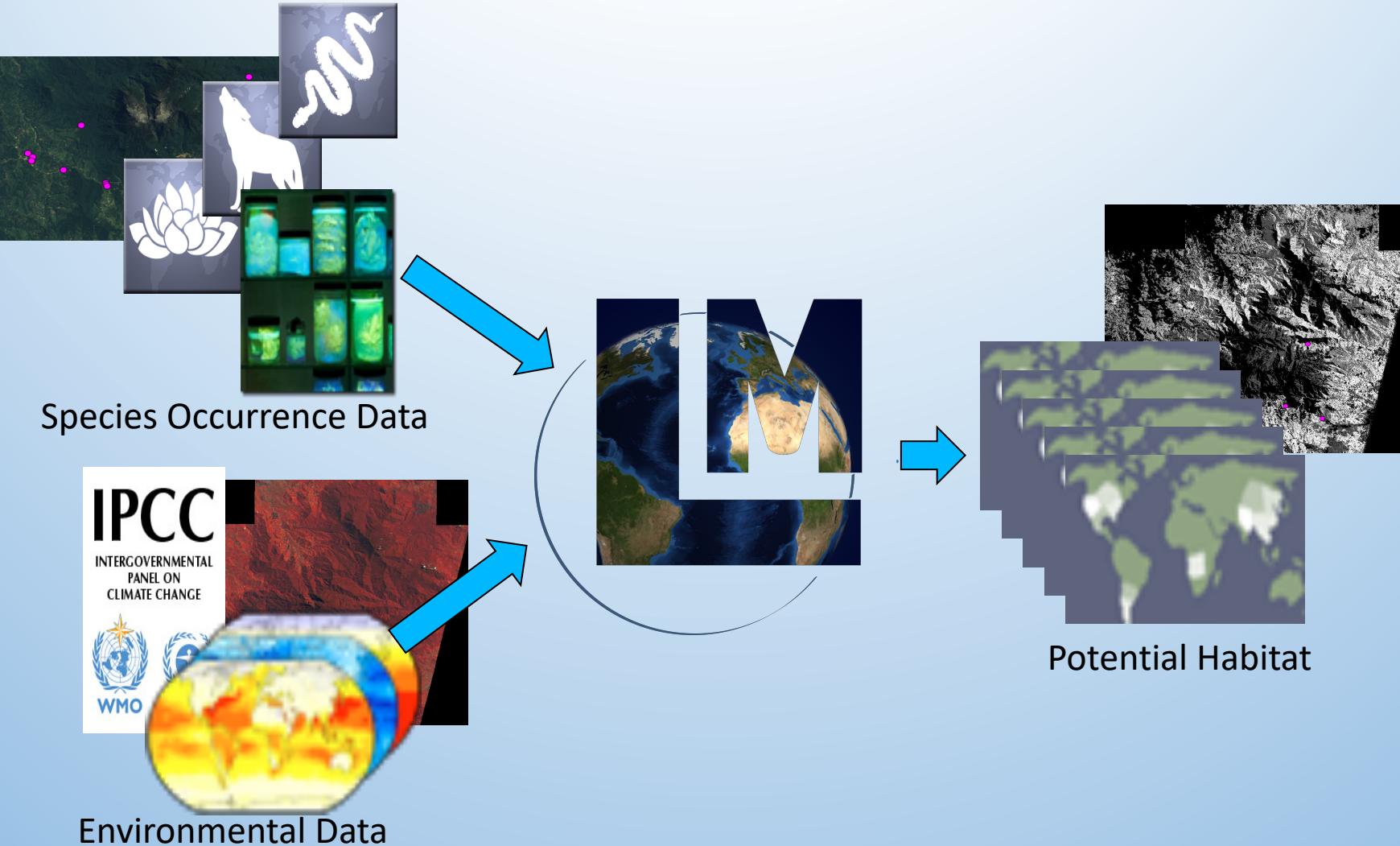
Macroecological Modeling

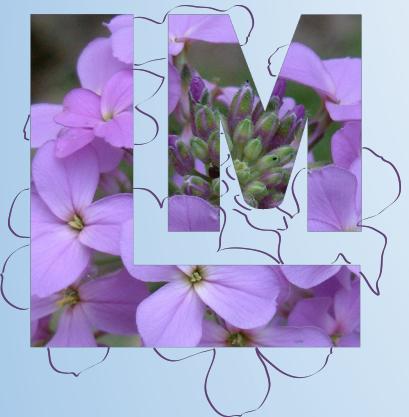




Analyses: Single Species

Species Distribution Modeling

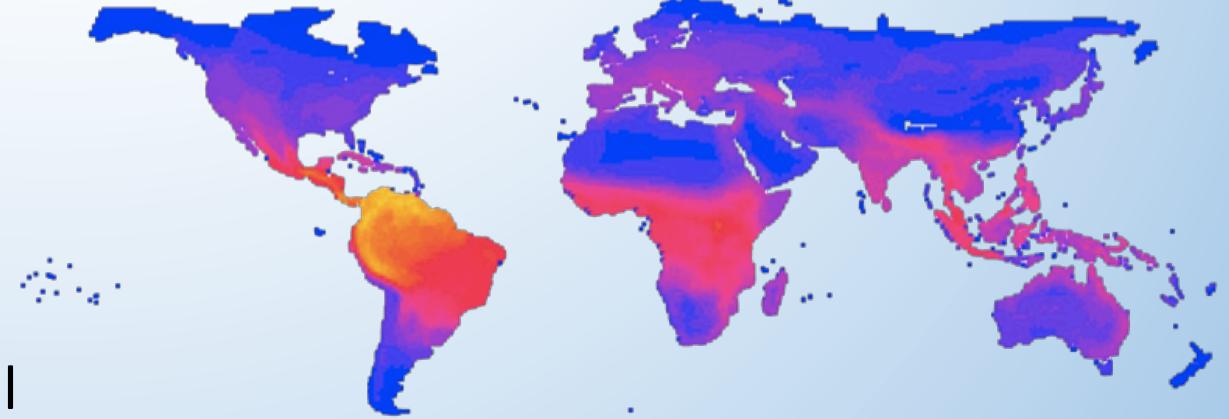




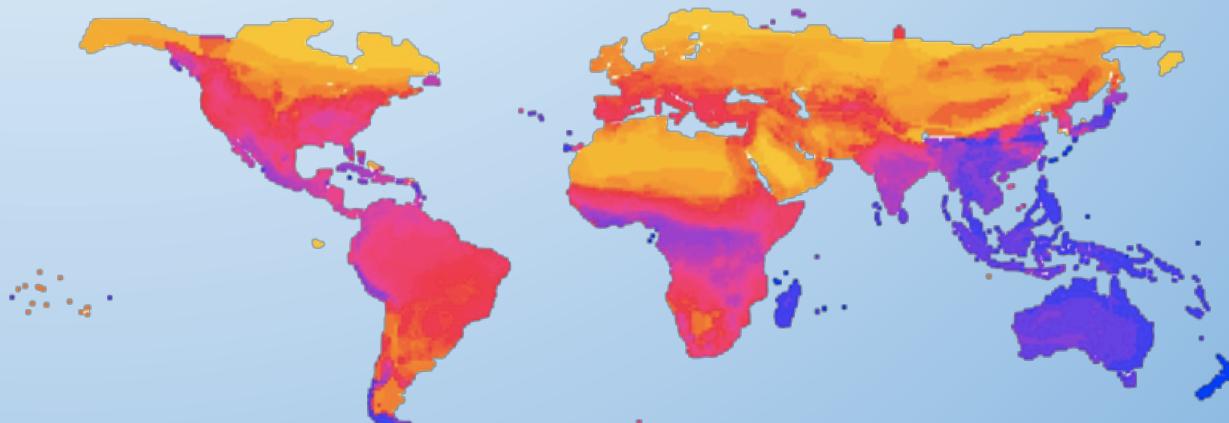
Analyses: Multi-Species

Multi-species

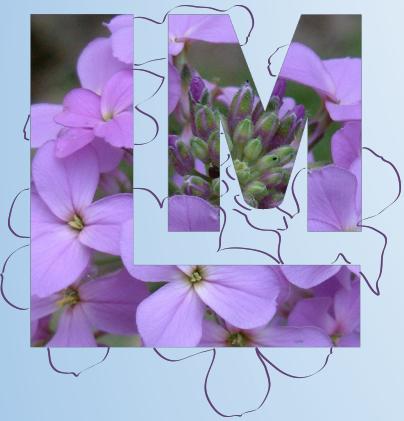
- Landscape-level, community-level
- Presence-Absence Matrices



Proportional Species Richness



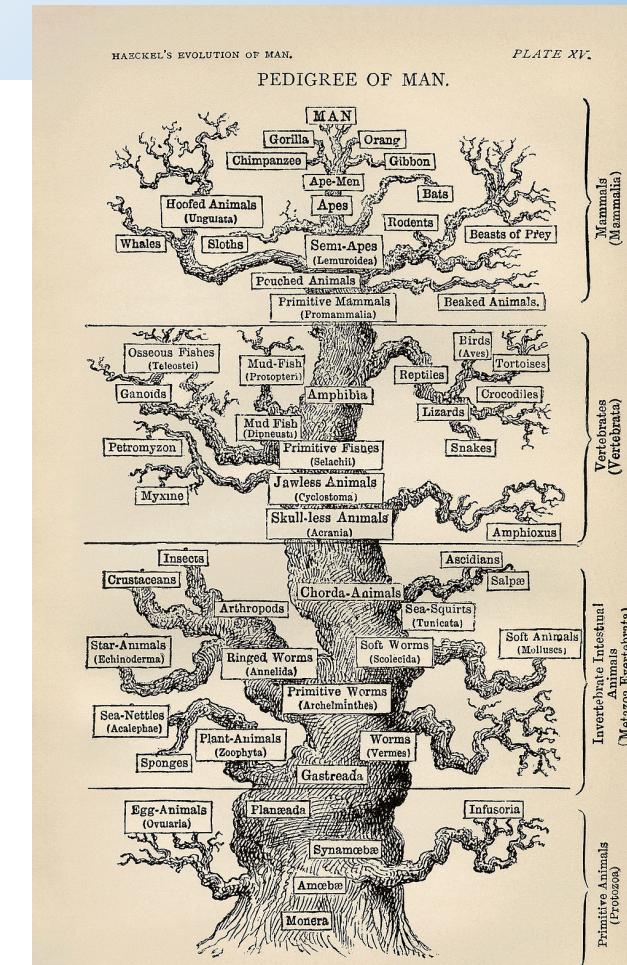
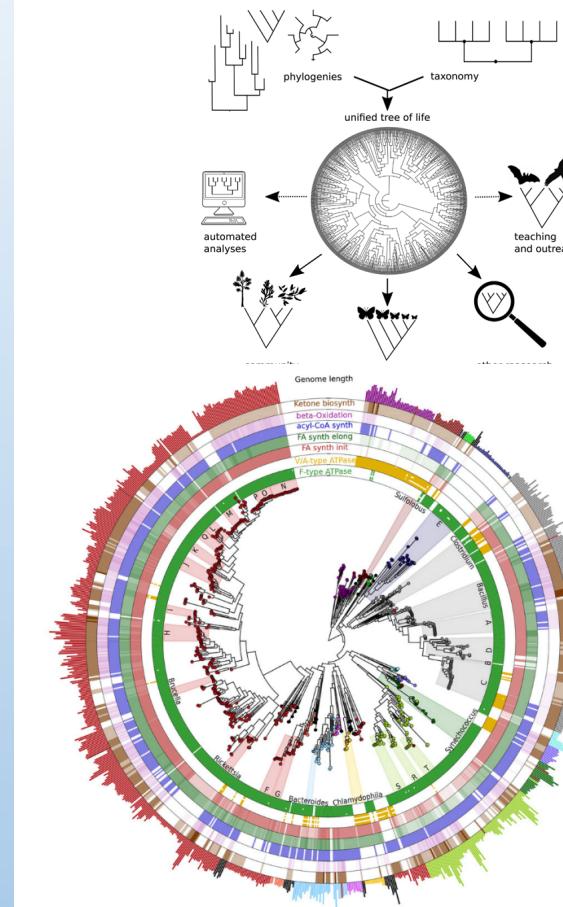
Per-site Range Size



Analyses: Meta Community Phylogenetic Analysis

Examine importance of joint effects on distribution and speciation

- Evolution: Phylogenetic trees
 - Biogeography: Physical geography
 - Environment: Climate, landcover





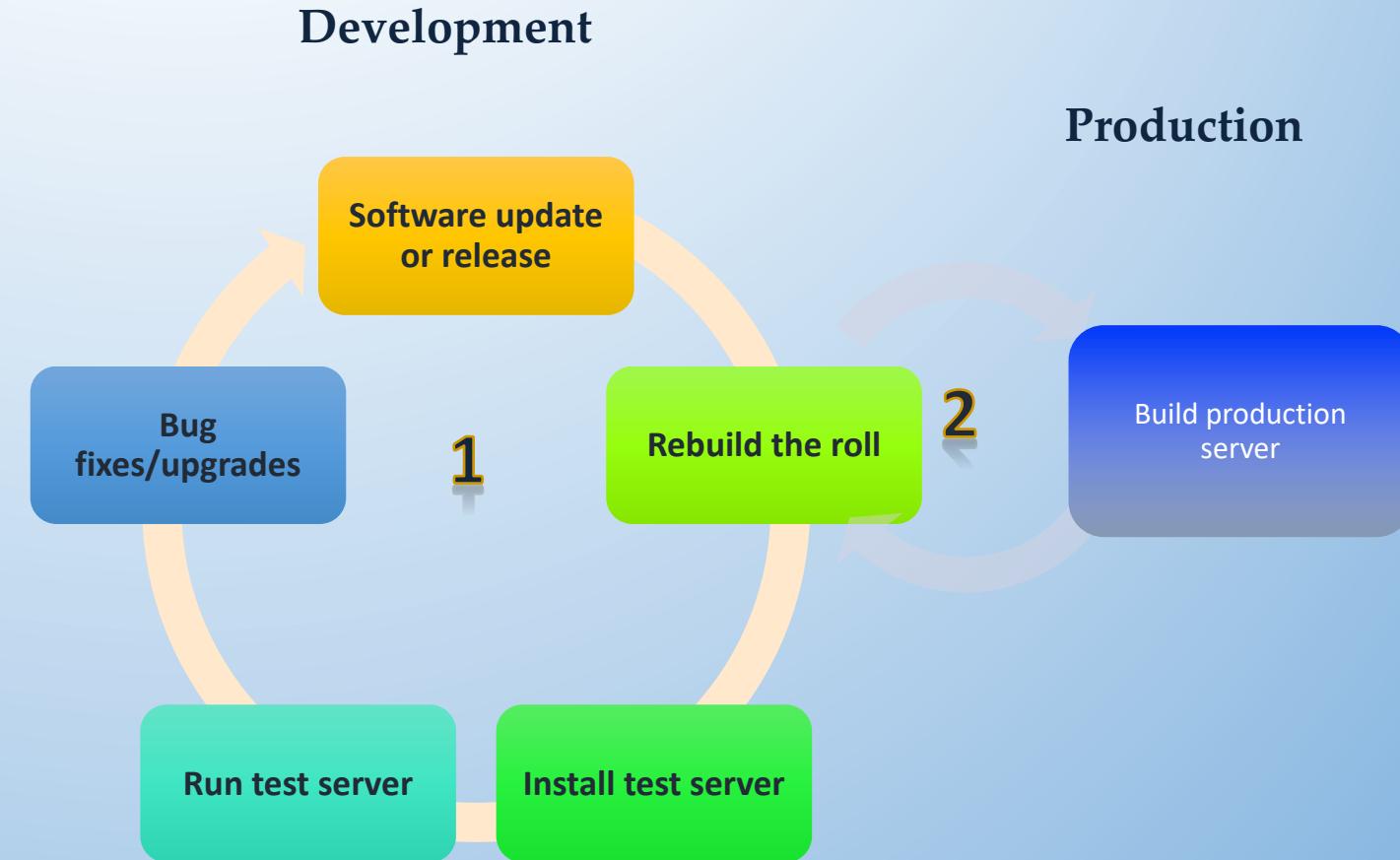
How did we get here?

- **Previously:**

- Large and fragile “Nailed to KU”
- Many interdependencies
- Small, successive grants and goals

- **PRAGMA collaboration**

- Packaged as Rocks Rolls
- Allows virtualization





Varying Deployment

Laptop or desktop machine

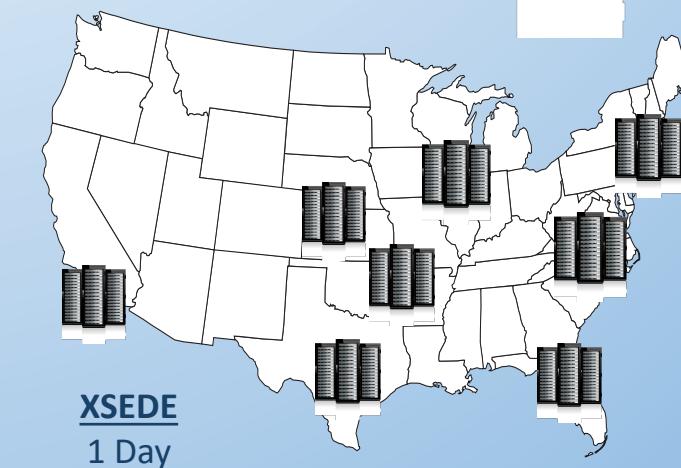
Virtual or physical clusters

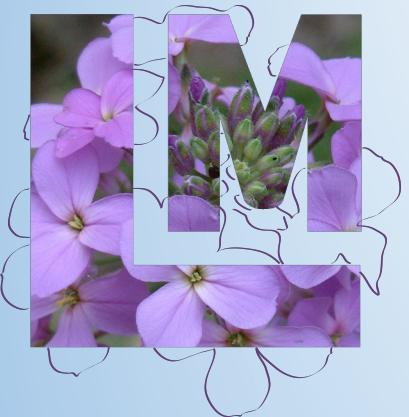
XSEDE (Comet) virtual clusters

Inputs
500,000 species
4 climate scenarios
3 model algorithms
(= 6 million models)



Desktop
1.8 Years





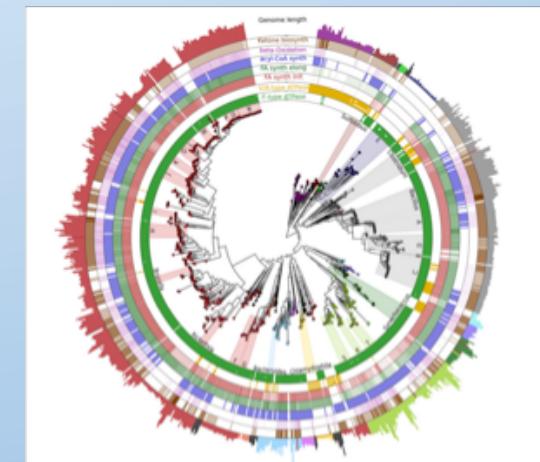
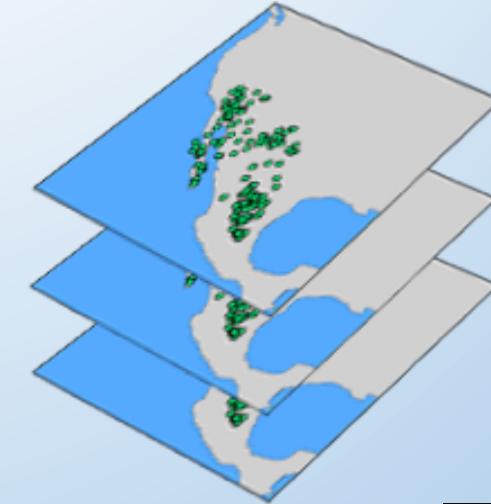
Collaborations

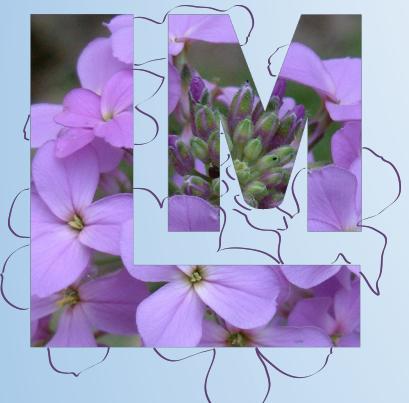
PRAGMA supported workshops and installations

- University of Indonesia, 50 participants
- NCHC, Taiwan, 30 participants

CENTRA

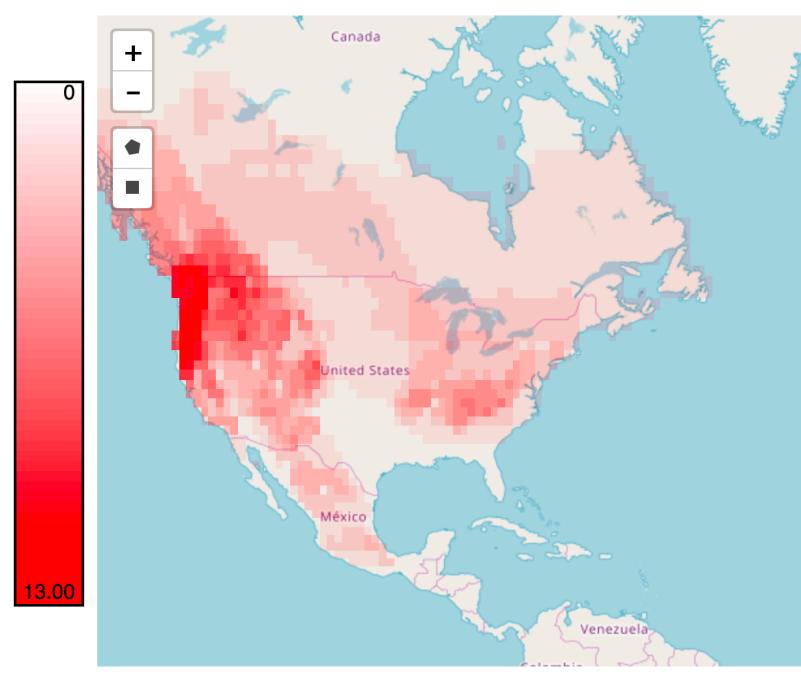
- NMMST and NCHC – Coastal Algae
- KU SAGE2 visualization wall funded



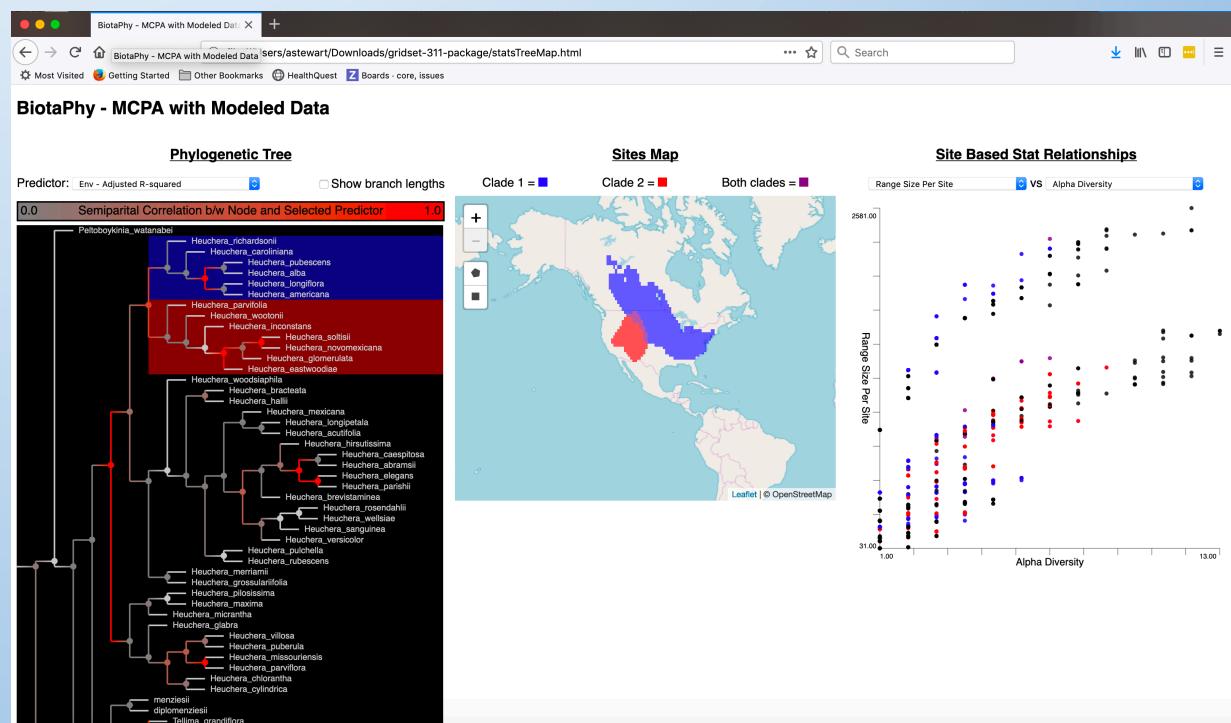


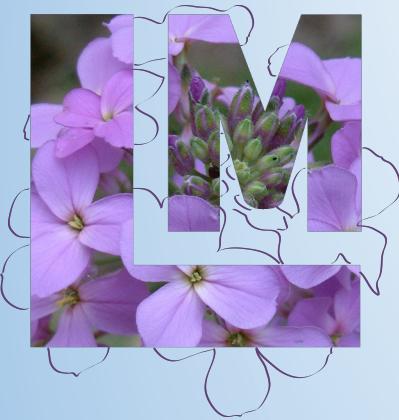
Collaboration: BiotaPhy

Connect biodiversity projects through
workflows with
integrated data providers

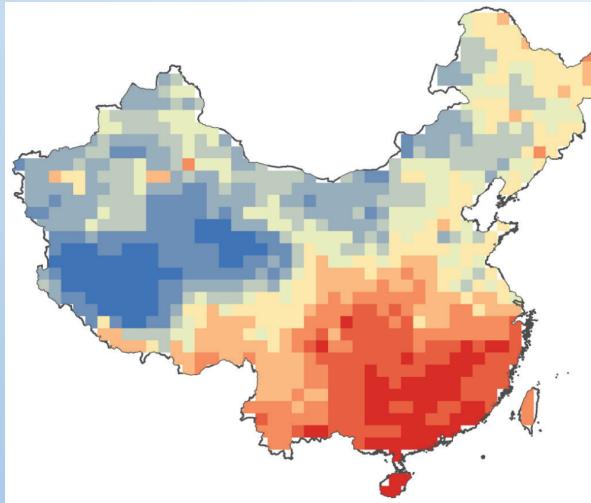


Lifemapper



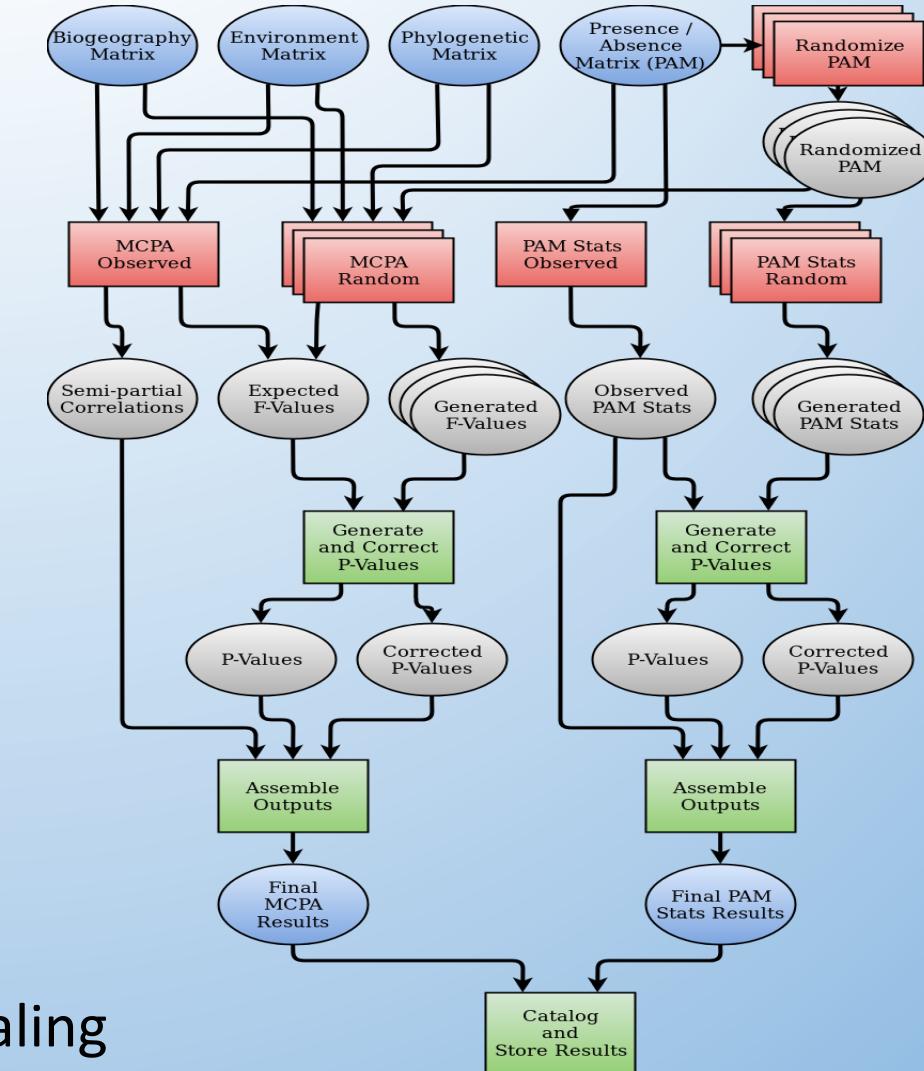


Challenges and Opportunities



New dimensions & analyses

Workflow scaling





Thank you!
고맙습니다



US NSF

OCI-1234983
BIO-1458422
BIO-1356732



USGS

BIP-G14AC00285

