

ecoforecast.org

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Ecological Forecasting Initiative
UNDERSTAND • MANAGE • CONSERVE

Operationalizing Ecological Forecasting Ft Collins, CO, 2016



Ecological Knowledge and Prediction
Tucson AZ, 2018

NSF OISE

TERN
SAEON
South African Environmental Observation Network

neon

Iterative near-term ecological forecasting: Needs, opportunities, and challenges

Michael C. Dietze^{a,1}, Andrew Fox^b, Lindsay M. Beck-Johnson^c, Julio L. Betancourt^d, Mevin B. Hooten^{e,f,g}, Catherine S. Jarnevich^h, Timothy H. Keittⁱ, Melissa A. Kenney^j, Christine M. Laney^k, Laurel G. Larsen^l, Henry W. Loescher^{k,m}, Claire K. Lynch^k, Bryan C. Pijanowskiⁱ, James T. Randersonⁿ, Emily K. Read^p, Andrew T. Tredennick^{q,r}, Rodrigo Vargas^s, Kathleen C. Weathers^t, and Ethan P. White^{u,v,w}

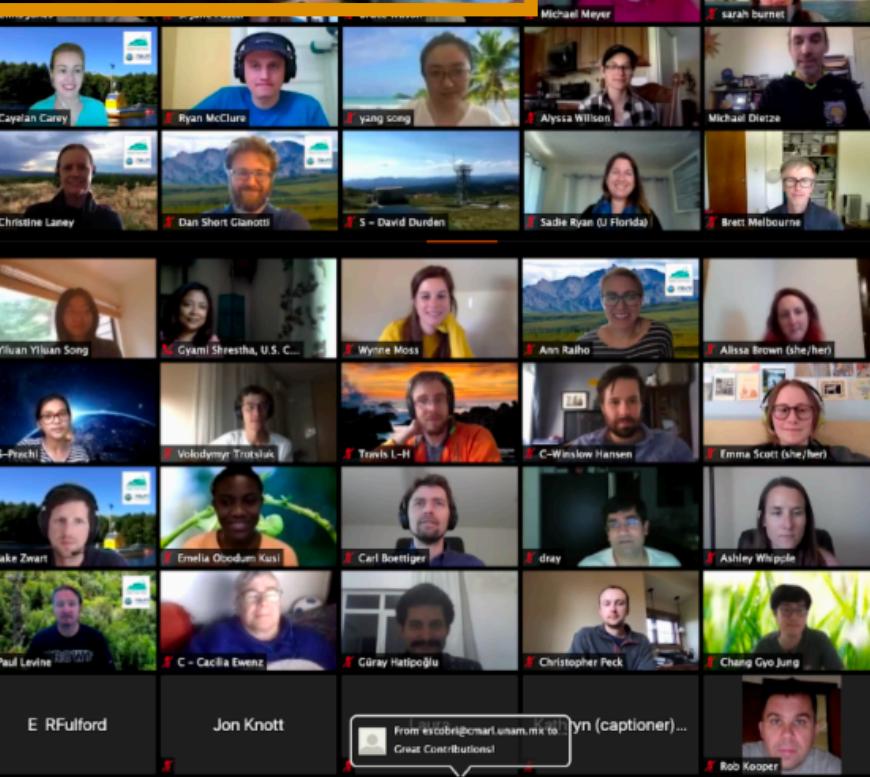


EFI2021

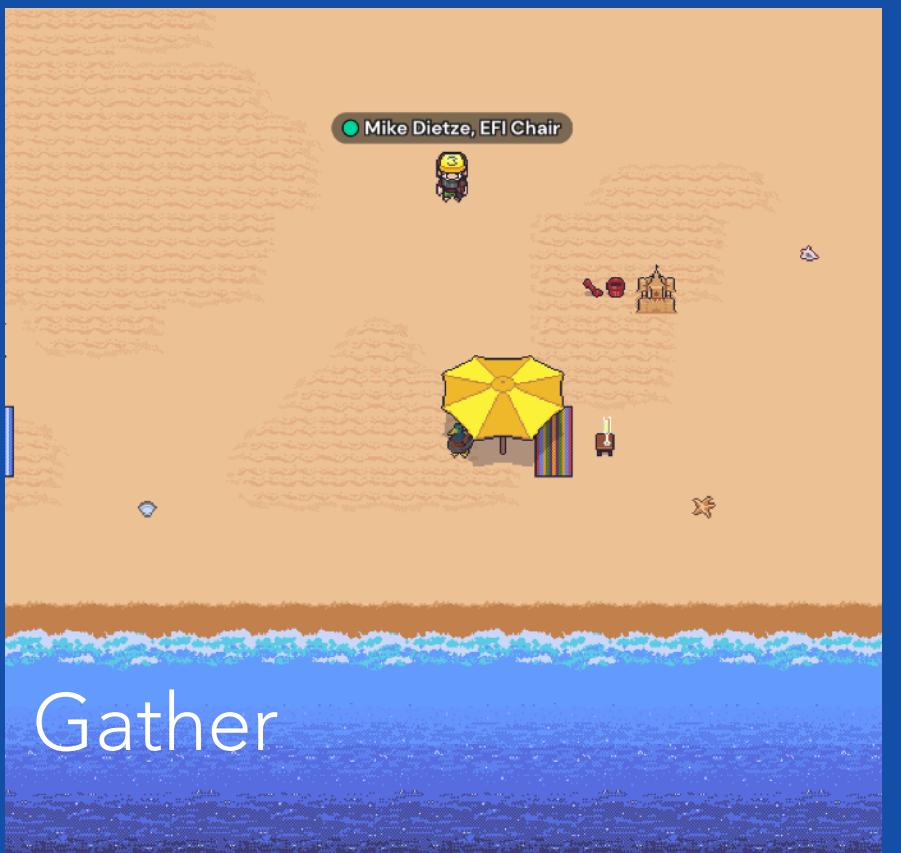
- Inclusive Pedagogy
- Student Association
- Educational Materials

EFI2019

Washington, DC, May 13-15



EFI 2022



Workshops & Conferences

- ESA
- AGU
- AMS
- ASLO
- GLEON

Session: Tue 1:30

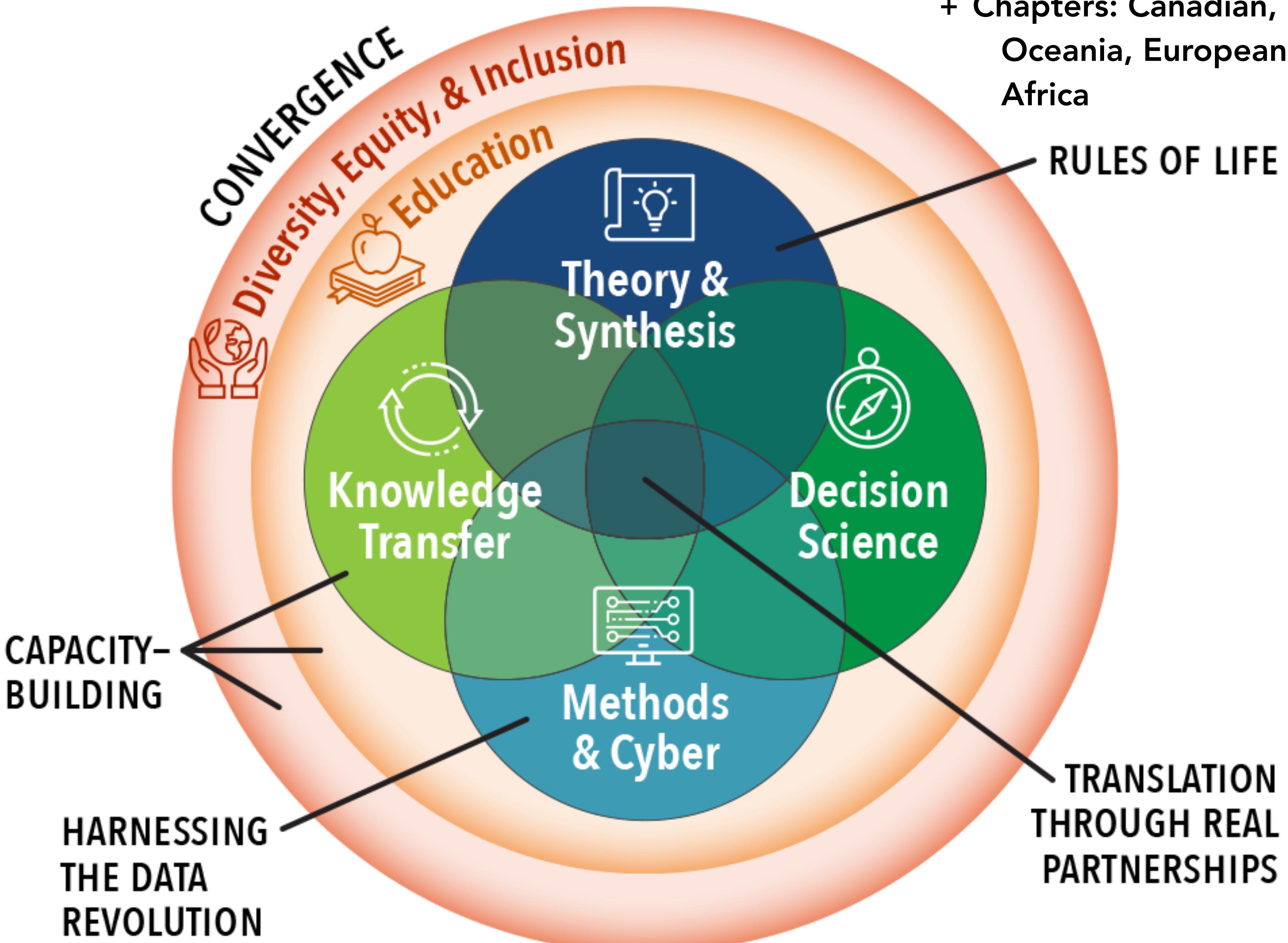
Social: Wed 6:30 Cartside

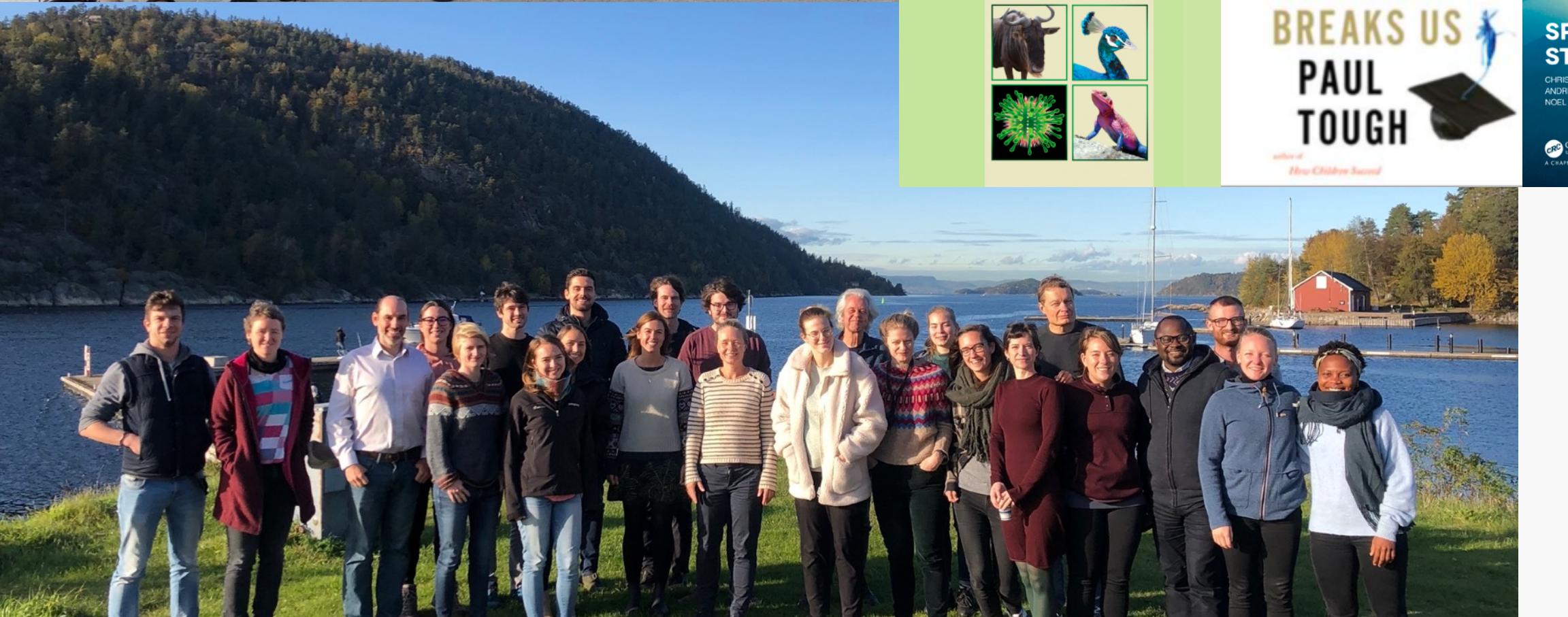
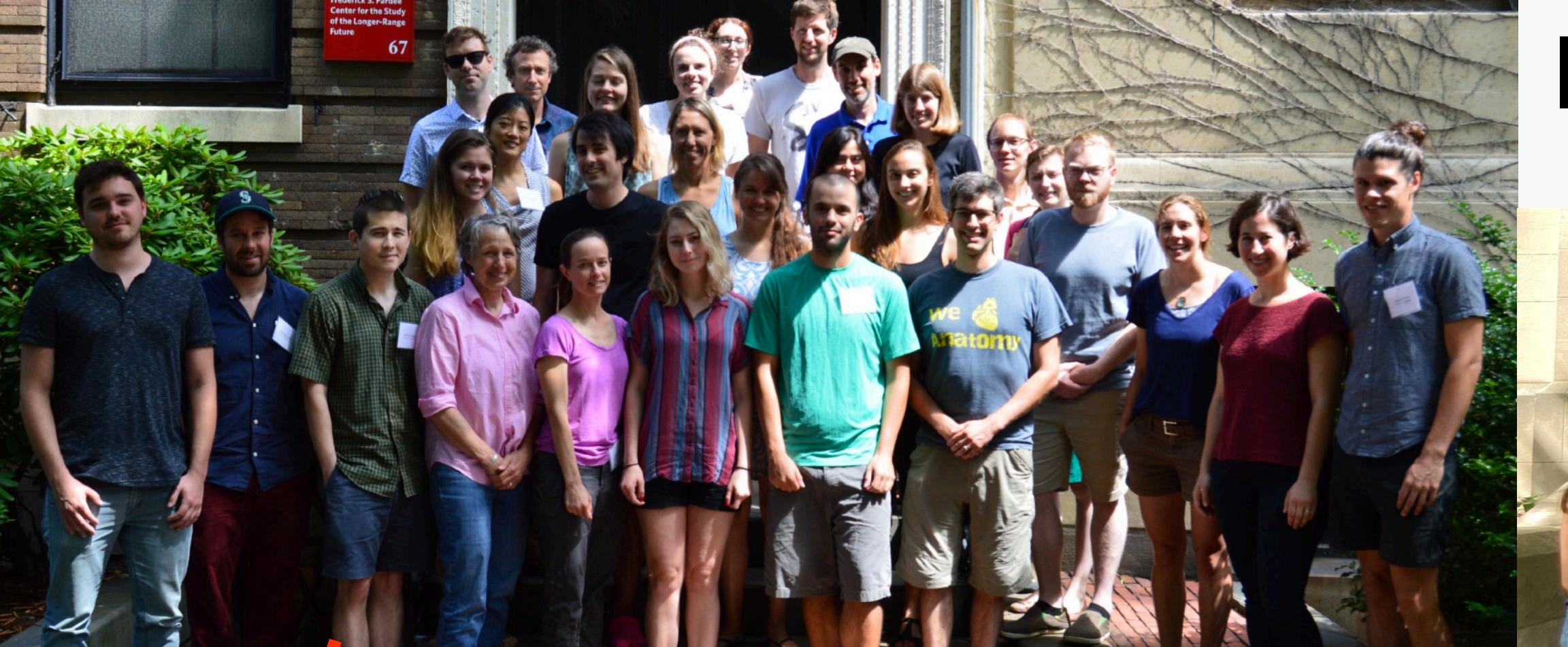
2024 - Finland (FMI)

2025 - Virginia Tech

EFI2023, Boulder, CO

Cross-Cutting Themes



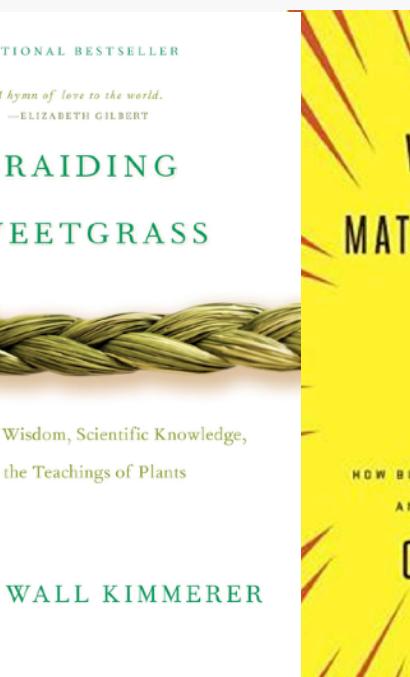
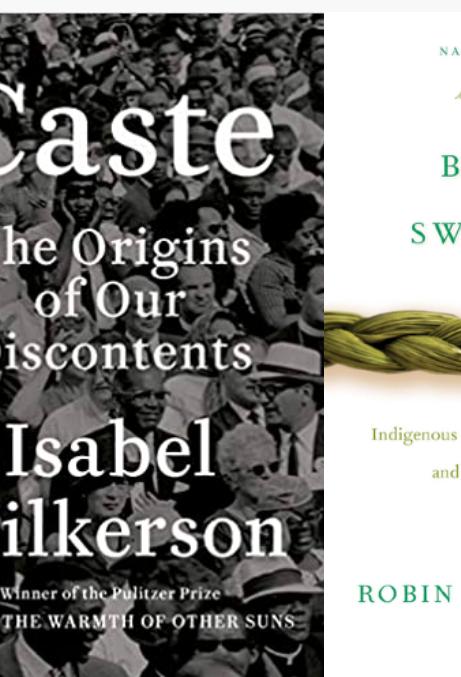
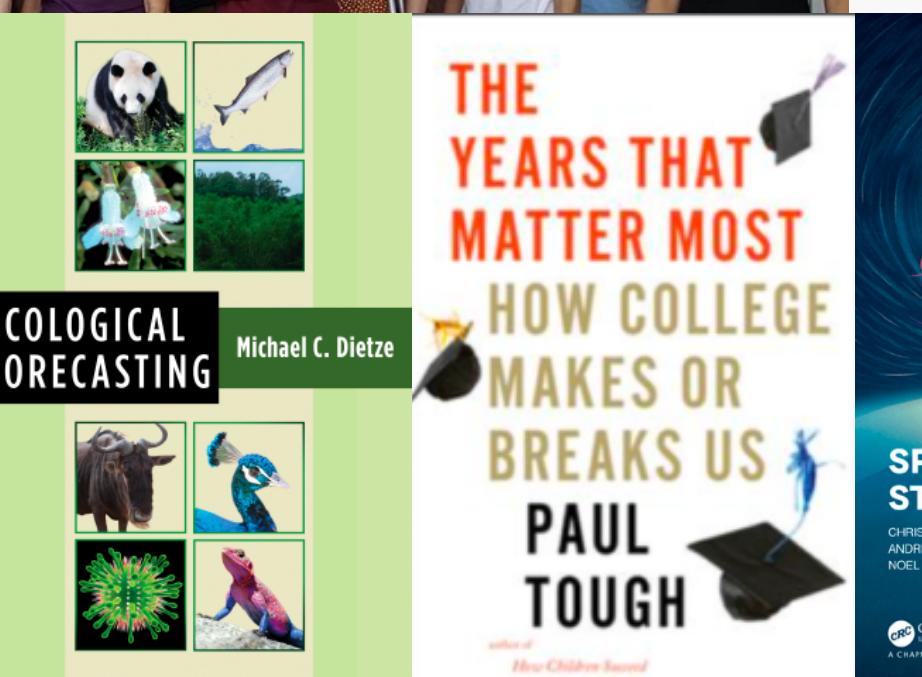
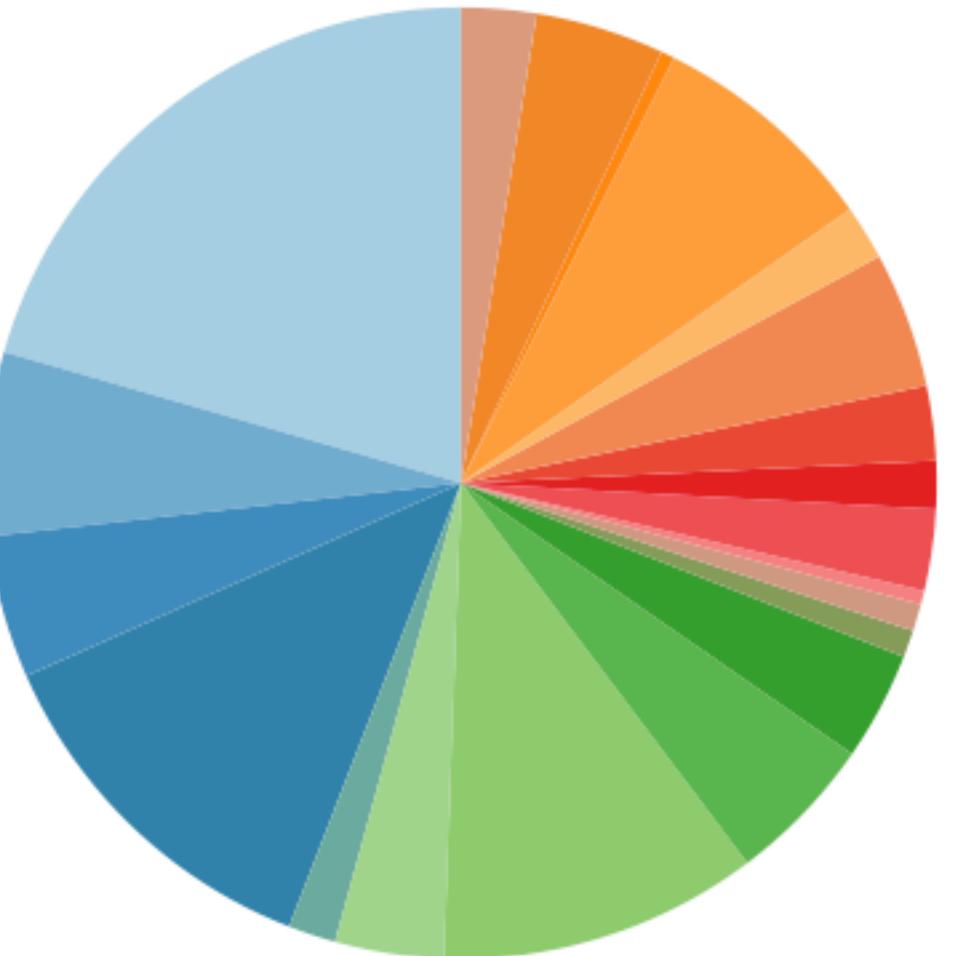


Education & Diversity



Online Resources (n=239)

Willson et al. 2023. Ecology and Evolution.
doi.org/10.1002/ece3.10001



- Basics of Coding
- Basics of Ecology
- Basics of Forecasting
- Basics of Statistics
- Data Assimilation
- Data Manipulation
- Data Sources
- Data Visualization
- Decision Science
- Forecasting Textbooks
- Interpreting Forecasts
- Iteration
- Machine Learning
- Mechanistic Models
- Model Assessment
- Resource Repositories
- State Space Models
- Statistical Models
- Traditional Ecological Knowledge
- Uncertainty
- Workflows & Open Science

MSI Mentoring



Ecological Forecasting—21st Century Science for 21st Century Management

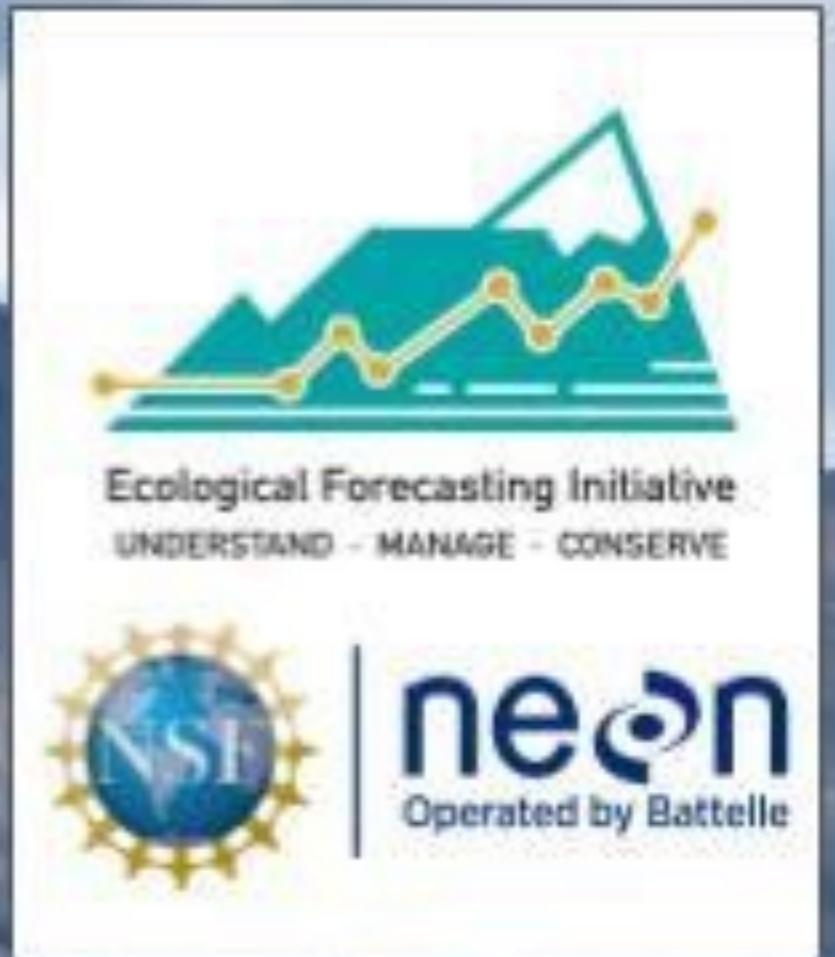


- Create , Package , Archive , Discover , Reuse -

- Policy briefs
- Interagency round-table
- Reports
 - NASA BDEF
 - Earth System Predictability
 - NACP Implementation Plan
- AMS & NEON WG
- **ESA forecasting award**

NEON FORECAST CHALLENGE

- Goal: Predict NEON site-level observation before they're collected
- Open to all participants and approaches (statistical, machine learning, mech., etc)
- Standard format, CI, "null" models: persistence, historical means
- Round 1 & 2: ~7000 forecasts from ~100 teams (11 courses)
- Round 3: 2023 <https://ecoforecast.org/efi-rcn-forecast-challenges/>
 - Tick population dynamics
 - Aquatic DO and water temperature
 - Phenocam vegetation phenology
 - Ground beetle biodiversity
 - Terrestrial carbon and water flux, soil moisture





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NEWSLETTER



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github.com/eco4cast/

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- Blog
 - Lessons learned
 - Forecast spotlights
- Task Views
- Webinars **YouTube**
 - Diversity & Data*
 - R Shiny*
 - Statistical Methods*
 - Science Comm.*
 - Coproduction
 - Communicating uncertainty

