CARBON MODELING

22 MAY 2019, LA JOLLA

SCALING
2. Ralph Keeling: atmospheric measurements for constraint
3. Phil Townsend: foliar functional traits for models
4. Erik Larson: mechanistic relationships
5. Min Chen: data-model fusion
6. Yonghong Yi: permafrost, scaling for resolution
7. Lei Hu: atmospheric inverse modeling, scaling, work with ecosystem modelers
8. Nick Parazoo: model inter comparison with common data
10. Kevin Schaefer: response functions, sub-grid heterogeneity
11. Mingjie Shi: how to use powerful datasets powerfully in models
12. Haris Riris: have LiDAR and XCO2 data—how best to serve to models
13. Kevin Dagon: SOC dataset creation, remote sensing models
14. Andy Fox: response functions, scaling, PFTs/traits
15. Bailey Morrison: spatial scaling in ecosystem models
16. Sophie Burke: align field data to models
17. Christina Herrick: CH4 measurements link to modeled CH4, lateral scaling, error propagation
18. Brendan Byrne: atmospheric flux inversions—compare atmospheric flux inversions to ecosystem models
19. Aram Kalhori: in situ flux measurements, long term, lateral heterogeneity, temporal scaling
20. Phil Marsh: linking data to models (hydrology, permafrost)
21. Gretchen Keppel-Aleks: model benchmarking, emergent time scales, emergent properties, tie to data
22. Shawn Serbin: data-model fusion, response functions
23. Abhishek Chatterjee: [late]
24. Colm Sweeney: [lurking]
Response Functions

• How do you incorporate multi-(spatial) scale observational datasets into coarse grid models? Response functions!

• Devil in the details...
  • Multi-variate controls
  • Representativeness
  • Still scaling issues: leaf to canopy

• Models should also be confronted against phenomena in addition to benchmarks and response functions

• SYNTHESIS: site-level MIP (Nick Parazoo)

• SYNTHESIS: response functions (Josh Fisher, Kevin Schaefer, Shawn Serbin, Erik Larson, ...)

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Scaling

• Multi-scale measurements
  • Analyses underway to assess error propagation
  • Shawn Serbin on albedo
  • Phil Marsh on nested towers and hydrology

• Sub-grid heterogeneity
  • Thermokarst, lakes, lateral flows, topography, veg type

• Lateral scaling
  • Within ABoVE domain
  • Beyond ABoVE domain

• SYNTHESIS: multi-scale assessments (Shawn Serbin, Phil Marsh)
Aligning Data with Models

• Build on Fisher Wordle to go more in depth into data requirements
• Work hand-in-hand with field teams and modelers
  • Modelers provide resource to field teams to provide modeling perspective on field campaign plans
  • Send modelers to the field! (enthusiasm)
• Data that are not directly incorporable into models?
  • E.g., traits vs. PFTs, NDVI vs. LAI, SIF vs. GPP
  • Use expansive datasets to explain model performance/behavior against benchmarks → helps to identify what may be needed in models
• SYNTHESIS: ABoVE met reanalysis (Jennifer Watts, Erik Larson, Kevin Schaefer, Shawn Serbin, Abhishek Chatterjee)
• SYNTHESIS: model improvements against data
Ecosystem Services & Carbon Modeling?

- C modelers should not attempt interfacing with stakeholders directly, but definitely should through translational groups?
- Need for economic valuation on carbon fluxes and stocks