Field & Remote Sensing measurements

- What are the (remaining) key knowledge gaps & needs?

  - Scaling relationships across different parameters: spatial/temporal scaling hierarchy
  - How to relate RS observations to biophysical properties?
  - Diagnosing and attributing greening/browning
  - How to quantify and propagate uncertainty?
  - Abiotic / Biotic drivers of vegetation dynamics; incorporation of heterogeneous landscapes

Field & Remote Sensing measurements

- What are the remaining data gaps?

  - Scaling from field measurements up to what modelers need
  - Inventory: where are we measuring and developing products?
  - Deconstructing greening/browning signals into components (unmixing/meaning: can sensing determine the causes of observed greening and browning?)
  - Data on interannual variability and vegetation productivity and potential controls
  - Ability to quantify changes in biomass

Field & Remote Sensing measurements

- Ways to fill primary data gaps & needs?

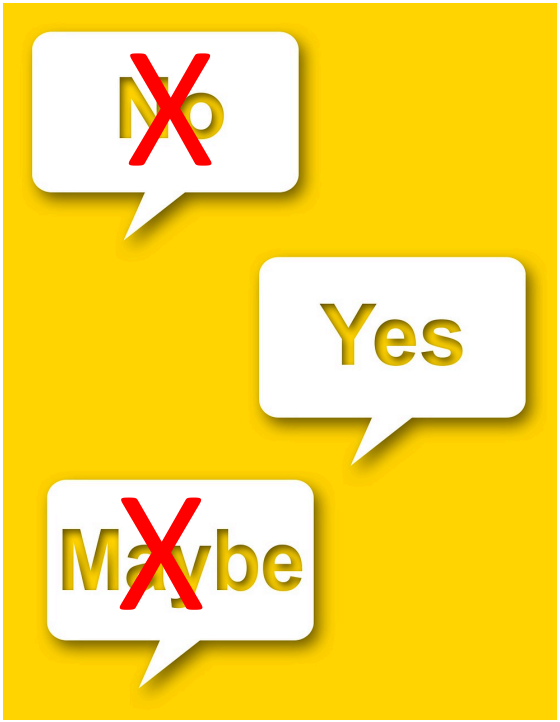
  - Lidar datasets (biomass)
  - High resolution abiotic parameters (< 100 m)
  - Actual high resolution DTMs; IFSAR DEMs/ABoVE DEM (c.f. Seattle w/shop)
  - Need for an additional effort to integrate datasets and produce meaningful information (cross walk)

Field & Remote Sensing measurements

- What complementarity in mapping & scaling efforts?
  - Find specific locations where in situ/drone/airborne/satellite data overlap (super sites)
  - Create ROIs around super sites to extrapolate wall to wall mapping within that ROI (~30 m tiles)
- How might data / observations inform management needs?
  - Collaboration with other groups/agencies developing similar products
  - Agencies developing land management policies
  - Habitat, Fuel load, Permafrost protection (lack of), Pest/logging managements
  - Communicate that to land managers; simplification of products

Informing Modeling efforts

- Broader suite of *in situ* measurements for cal/val?



(super sites)

Informing Modeling efforts

- What data are lacking w.r.t. informing & assessing models?
  - Collaborations between modelers and field groups
  - Species composition, forest structure data, environmental variables at high resolution, soil maps
  - Match observations to modeling outputs
  - Independent validation sites (forest service in Alaska as a example/model)

- How can models best inform vulnerability assessments?
  - "Question not attempted"
- Utilize model-data framework, comparisons, benchmarking?
  - "Question not attempted"

What Phase 1 activities will continue & which if any will expire?

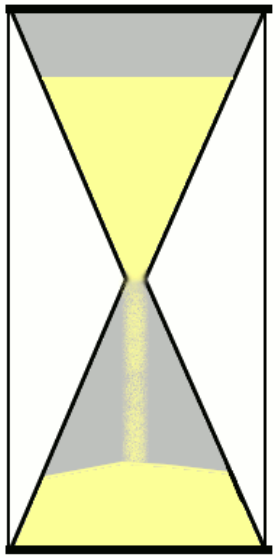
"Not addressed"

Specifically revisit synthesis activities & update those

- What are the ongoing synthesis efforts?
  - Shifts in ecotones- tundra/taiga (Paul M.)
  - Boreal greening/browning (Scott G.)
  - Biomass (Laura B-C)
  - Tundra greening/browning (Howie E.)
  - Fire recovery/ veg dynamics post-fire (co-lead Adriana F.)
  - Inventory (Matt M.)
    - Case study of areas to develop products for and compare methods
  - Scaling (Shawn S.)
  - Modeling (Erik Larson)
  - Thanks to the “volunteers” (let us know if incorrect)

Specifically revisit synthesis activities & update those

- Who specifically is leading / will lead them?
  - No time!
- What publications are expected?
  - No time!



A rough transcript can be posted

Vegetation Dynamics Breakout Report

That's a wrap

Vegetation Dynamics:

- Succession/recovery following disturbances (***with Fire WG***)
- Forest greening/browning including role of climate & insects in forest decline
- Tundra greening/browning including shrub expansion & densification

ABoVE WG Coordination & Synthesis Activities

Carbon Dynamics:
Changes in seasonal amplitude of CO2 concentrations
CH4 data/knowledge gaps
Aquatic carbon fluxes
Partitioning net ecosystem exchange components
C Flux measurements in permafrost ecosystems (***with Hydrology/Permafrost WG***)

Hydrology / Permafrost:
Active Layer Distribution - synthesize & assess active layer depths (***with SAR WGs***)
Freeze-thaw dynamics and timing (***with C Dynamics WG***)
Lake trends – comparison of methods & long-term trends in lake area, and drivers
Snow properties – crosscutting synthesis activity ***with Wildlife WG***

Fire Disturbance:
Wildfire soil carbon combustion synthesis
Post-fire forest regrowth composition & trajectories (***with Veg Dynamics WG***)

Vegetation Dynamics:
Succession/recovery following disturbances (***with Fire WG***)
Forest greening/browning including role of climate & insects in forest decline
Tundra greening/browning including shrub expansion & densification

Thematic Breakouts

- 5 breakout groups (chair): rooms

1. Fire Disturbance (Laura B-C): Room 150
2. Ecosystem Services / Knowledge co-production (Natalie Boelman): Room 155
3. Carbon Dynamics (Colm Sweeney): Plenary Room
4. Vegetation Dynamics (Howie Epstein): Room 165
5. Hydrology and Permafrost (Mahta M): Room 160

Self-select to breakouts

- If you have multiple project participants, go to different WGs

Assign / volunteer a rapporteur

Vegetation Dynamics Breakout (Chair: Howie Epstein) Notes-1

- **Field & Remote Sensing measurements**
  - What are the (remaining) key knowledge gaps & needs?
    - Scaling relationships across different parameters- spatial/temporal scaling hierarchy
    - How to relate RS observations to biophysical properties?
    - Diagnosing and attributing greening/browning
    - How to quantify and propagate uncertainty?
    - Abiotic and Biotic drivers of vegetation dynamics and incorporation of heterogeneous landscapes
  - What are the remaining data gaps?
    - Scaling from field measurements up to what modelers need
    - Where are we measuring and developing products? (inventory)
    - Deconstructing greening/browning signals into components (unmixing/meaning)
    - Data on interannual variability and vegetation productivity and potential controls
    - Ability to quantify changes in biomass
  - Ways to fill primary data gaps & needs?
    - Lidar datasets (biomass)
    - High resolution abiotic parameters (<100m)
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    - Need for an additional effort to integrate datasets and produce meaningful information (cross walk)
  - What complementarity in mapping & scaling efforts?
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    - Habitat, Fuel load, Permafrost protection/ lack of, Pest/logging managements
    - Communicate that to land managers/ simplification of products

- **Informing Modeling efforts**
  - Broader suite of *in situ* mmts for cal-val?
    - YES, super sites!
  - What data are lacking wrt informing & assessing models?
    - Collaborations between modelers and field groups
    - Species composition, forest structure data, enviro variables at high res, soil maps,
    - Match observations to modeling outputs
    - Independent validation sites (forest service in Alaska as a example/model)
  - How can models best inform vulnerability assessments?
  - Utilize model-data framework, comparisons, benchmarking?

Vegetation Dynamics Breakout (Chair: Howie Epstein) Notes-2

- **What Phase 1 activities will continue & which if any will expire?**
  - For those continuing, how will they change with phase2?
  - For those expiring, what is the history?
    - Completed, publication(s) expected
    - Abandoned due to…. (no lead, no longer relevant, no support)

- **Specifically revisit synthesis activities & update those**
  - What are the ongoing synthesis efforts?
    - Shifts in ecotones- tundra/taiga (Paul)
    - Boreal greening/browning (Scott)
    - Biomass (Laura)
    - Tundra greening/browning (Howie)
    - Fire recovery/ veg dynamics post-fire (co-lead Adriana)
    - Inventory (Matt)
      - Case study of areas to develop products for and compare methods
    - Scaling (Shawn Serbin)
    - Modeling (Larson)

  - Who specifically is leading / will lead them?
  - What publications are expected