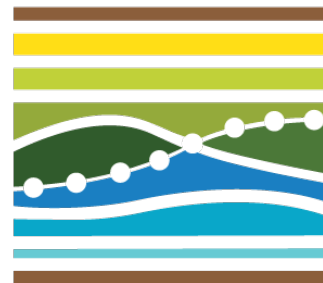


Bonanza Creek LTER

Michelle Mack

LTER SCIENCE COUNCIL MEETING 2018

MADISON, WI



NATIONAL SCIENCE FOUNDATION

LTER NETWORK

LONG TERM ECOLOGICAL RESEARCH

Site News

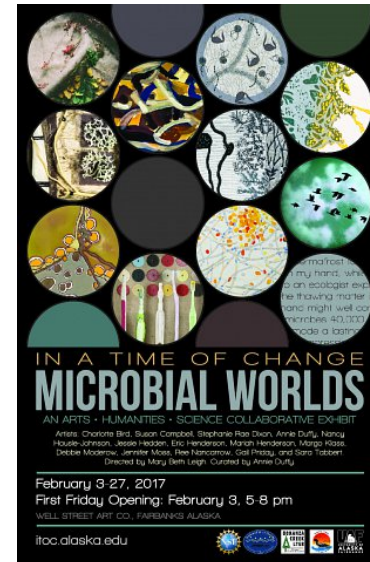
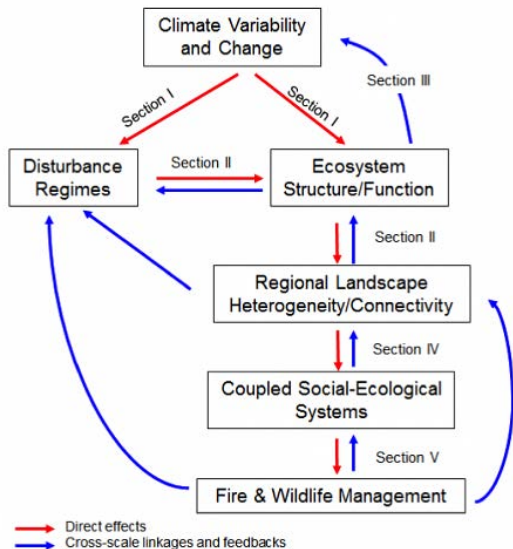
New climate: BNZ soil active layer did not freeze through this winter—first time in history of site

New Themes: Macrosystems Perspective: cross-scale effects, feedbacks and interactions

Personnel: Tamara Harms (UAF), Helene Genet (UAF), Pat Doak (UAF), Scott Goetz (NAU), Feng Sheng Hu (UIC)

Partners: co-production partners participated in annual symposium: AKFSC, NPS, AKDF, Alaska Native groups, USFS

Outreach and inreach: In a Time of Change: Microbial Worlds: Fostering science summer camp



Organic Matter - Who/How

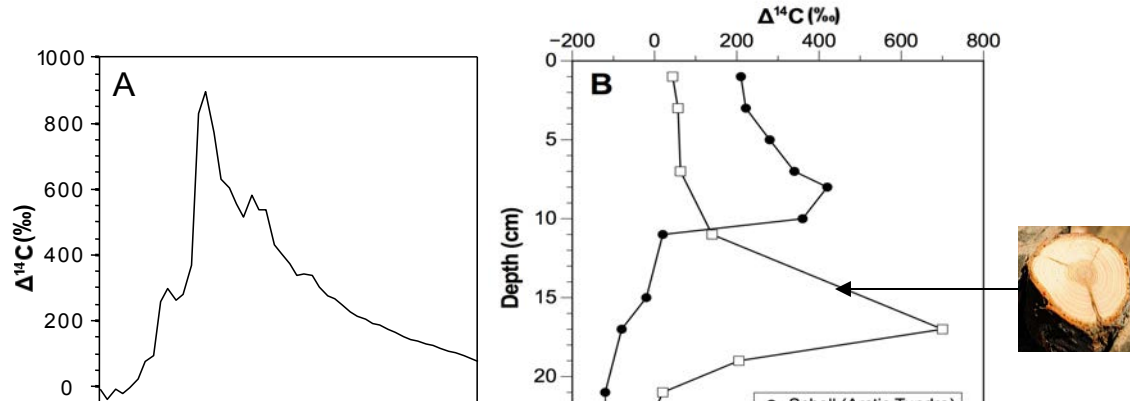
- Cold and/or frozen soils and slow decomposition means that BNZ terrestrial ecosystems are dominated by old organic matter
- Legacy of past climate, disturbance events, and ecosystem dynamics
- Warming climate is increasing the coupling between old organic matter and new ecosystem processes
- Goal: Linking old organic matter to local and global biogeochemical cycles
 - Is warming climate thawing permafrost soil organic matter?
 - How does this impact carbon balance, nutrient fluxes, terrestrial-aquatic transfers?
 - How does this impact global biogeochemical fluxes of CO₂ and CH₄?
 - Are increasingly severe fires burning old organic matter?
 - How does this impact Net Ecosystem Carbon Balance (NECB)?
 - How does this impact nutrient balance, soil thermal regime and permafrost, forest regeneration?



Organic Matter - Results



Radiocarbon records stratification of soil organic layer



- Legacy OM is > stand age
- If legacy OM is combusted, it will not be replaced over the next fire cycle
- Burning of legacy OM will shift NECB from sink to source

- If soil age > stand age, then legacy OM burned
- Mature stands did not lose legacy OM—even when they burned severely
- Young stands—termed reburns—lost legacy OM

