

# Progress Report

## Assessing and mapping regional variation in potential site carrying capacity

Project Code CAFS.19.76

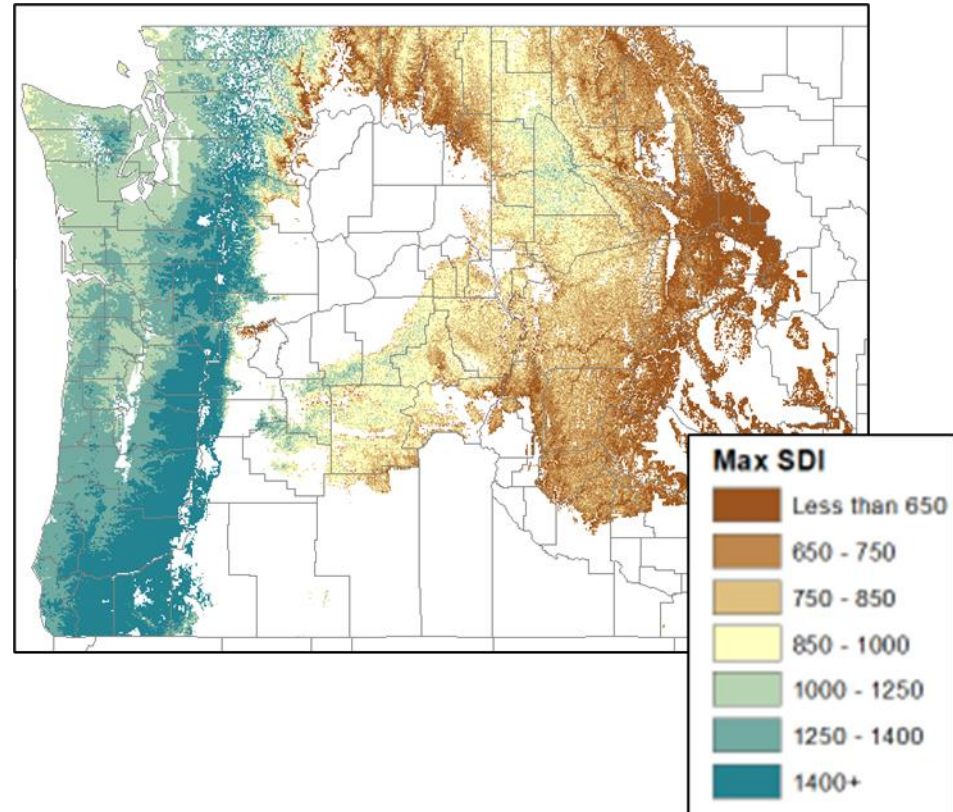
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Douglas Mainwaring (OSU), Eric Turnblom (UW)

Presenting: Mark Kimsey



# Project Overview

- 1) Synthesize a nationwide forest inventory database from publicly available data and from CAFS members,
- 2) Standardize maximum carrying capacity modeling, and
- 3) Create efficiencies for multi-regional forest management organizations by providing consistent, species-site-silviculturally sensitive, wall-to-wall spatial models of  $SDI_{max}$  for commercial species of the United States.
- 4) Assess stress thresholds for non-density (i.e. pine beetle) related mortality events in pine forest systems

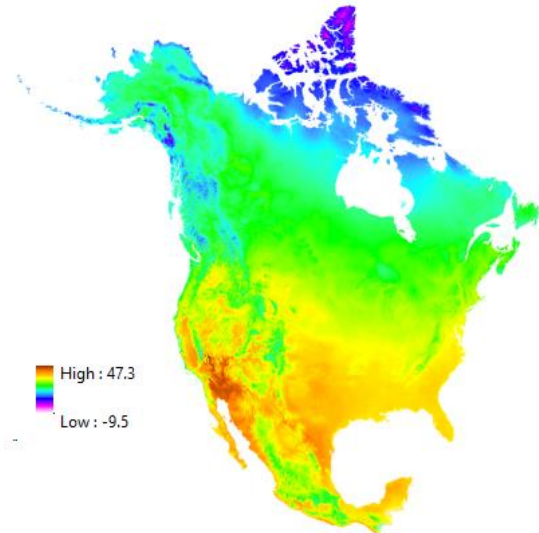


# National Level Physiographic Datasets

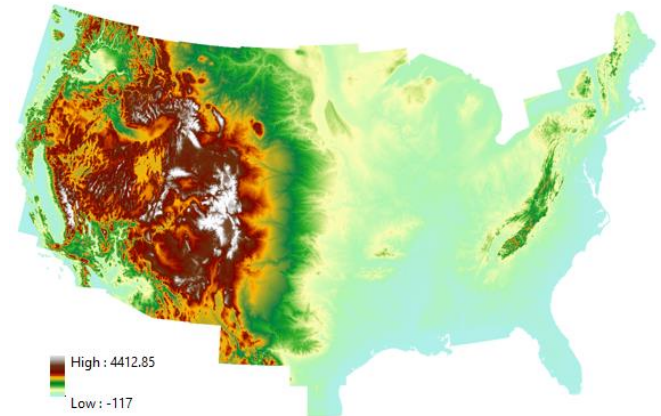
From 3DEP 1 arc-second dataset from the USGS's 3D Elevation Program		Spatial Resolution
1	30 meters (1 arc-second) elevation	30 m
2	30 meters (1 arc-second) Slope	
3	30 meters (1 arc-second) Aspect	
4	Sin (Aspect)	
5	Cos (Aspect)	
6	Tan (Slope)	
7	Tan (Slope) * Cos (Aspect)	
8	Tan (Slope) * Sin (Aspect)	
9	Topographic Wetness Index	
10	Solar Radiation	
From USGS_SGMC Geodatabase		
1	Lith1	~1:250K
2	Lith2	
3	Lith3	
4	Total_Lith	
	etc.	
From ClimateNA		
1	33 Bioclimatic variables	1km
2	48 Monthly variables	
From gSSURGO		
1	Soil organic carbon	30m
2	Available water storage	
3	Crop productivity indices	
4	Crop root zone depths	
5	Available water storage within crop root zone depths	
6	Drought-vulnerable soil landscapes	
7	Potential wetland soil landscapes	

# Current Progress

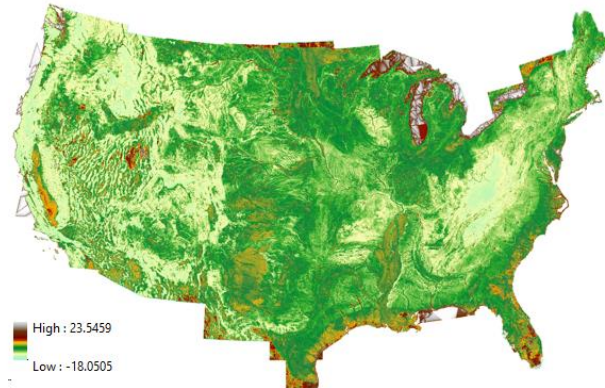
Normal 1991-2020 Tmax July



Elevation



TWI



# Future Plans

- Post-doc Jaslam Poolakkal finalizing SDImax datasets 12/31/2022
- Will begin SDImax model development, prioritizing Pacific southwest, southern US and northeastern US
- Task doctoral candidate Haley Anderson to begin looking at pine beetle mortality incidence as a function of climate x density x site characteristics
  - Questions:
    - Are pine beetle outbreaks a sole function of the size/density relationship during stand development?
    - What climatic conditions induce pine beetle outbreaks and at what point in the size/density development of a forest stand?
    - Does projected climate change indicate shifts in pine carrying capacity as a function of site type and species composition?
  - Deliverables:
    - A GTR creating a pine management guide flexible to climate, species composition, site type, and method of measurement (lidar vs traditional stand exam).

