Mapping of stress on native tree species across western U.S.A. & Canada: interpretation of climatically-induced changes using a physiologically-based approach

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Major Points

- importance of mapping soil $H_2O$ storage
- Spatially linked max leaf area to productivity
- value of sharing data with the public
Base map of modeled estimates of available soil water storage capacity (mm)


http://databasin.org/maps/new#datasets=9c19fc0df04c43aea41983fcfce358c0
Base map of modeled estimates of soil fertility at 1 km resolution (0 = poorest; 1.0 = best)


http://databasin.org/maps/new#datasets=9c19fc0df04c43aea41983fcfce358c0
Simulated max LAI (2000-2009 climate)

Relation between modeled max LAI & site productivity (3,356 field plots)

Simulated change in maximum leaf area index 2000-2009 in reference to 1950-1975 climate

Effect on max LAI when soil H₂O storage = 200 mm

Effect on predicted range when soil H₂O storage changed ± 50%

Project shares all data via Conservation Biology Institute’s website: databasin.org

- remote sensing products
- model code in C++
- soils mapping units
- species present at 44,000 field sites
- simulated shifts in range of 20 species
- publications
Lodgepole pine: Predicted potential shift in range since 2000

http://databasin.org/maps/3ab37b564d2f461eba551534350a55da/active
Relative change in summer soil water constraints (± 20%) contrasting climate conditions since 2000 with 1950-75 period

http://databasin.org/maps/dcd8043a7ed44581adae3555fe0f6db8/active
80 sites where twenty tree species are predicted to have the potential to contract (red) or expand (green) their range since 2000.
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Project website:
http://www.pnwspecieschange.info/