USFS – NASA Virtual Pitch Fest / June 3, 2020

Estimation of Rangeland Yield from Soil Moisture Active passive (SMAP) Data Products

By: Mahesh Pun and Matt Reeves

About Me

Mahesh Pun, PhD

- Senior Research Scientist at NASA's Goddard Space Flight Center
- Applications Coordinator for Soil Moisture Active Passive (SMAP) project

Matt Reeves, PhD

- Research Ecologist at United States Forest Service at Missoula, Montana
- Application of remote sensing and GIS to facilitate evaluation of contemporary issues facing US rangelands

Work focus areas

- Soil Moisture and Rangeland Management

Estimation of Rangeland Yield from SMAP Data

The Idea

- **Regional scale analysis**
  - Southwestern Region (3)
  - Intermountain Region (4)

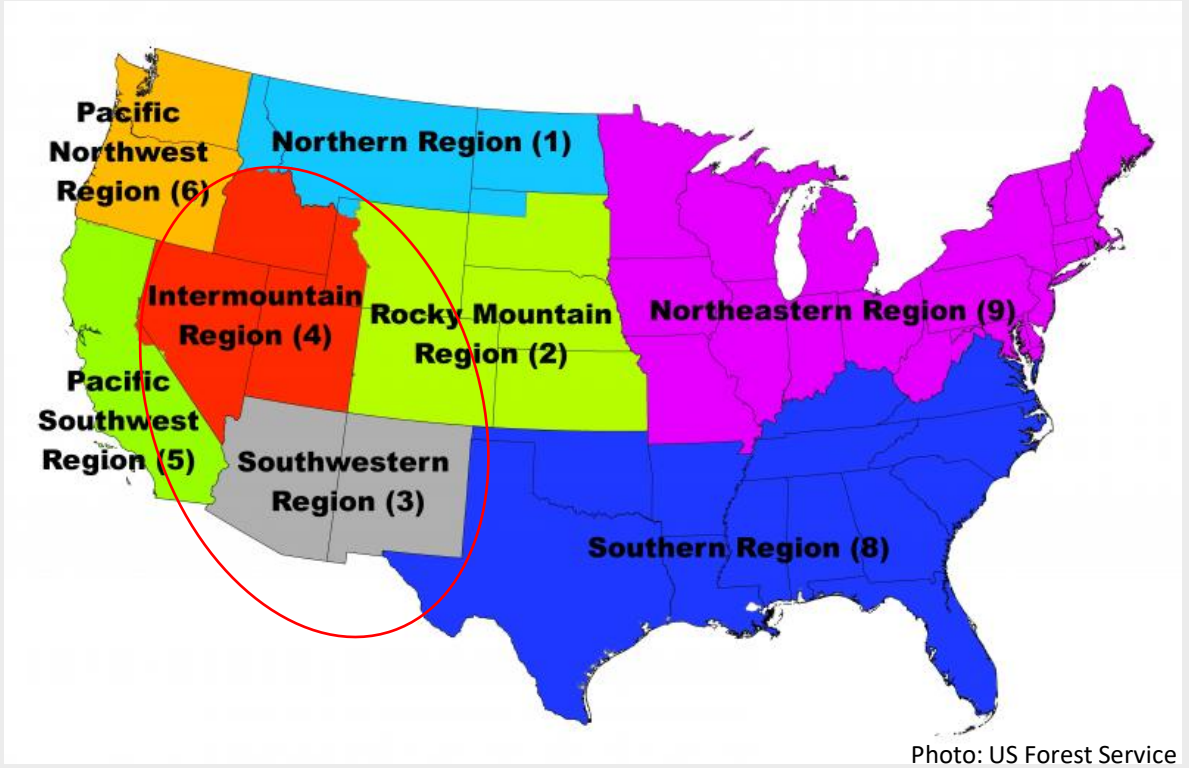


Photo: US Forest Service

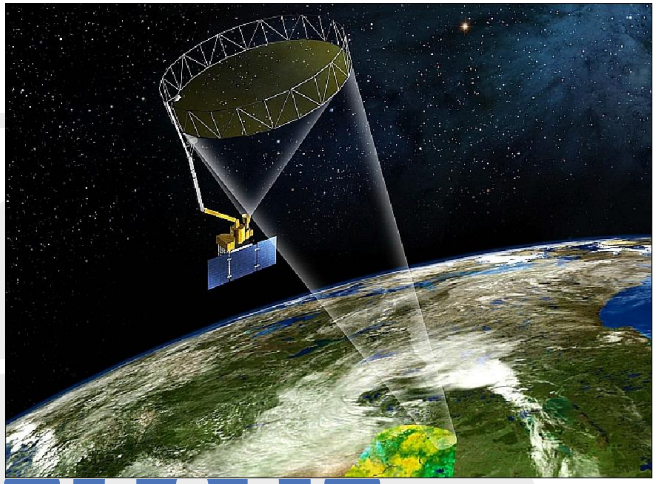
The Idea

Estimation of Rangeland Yield from SMAP Data

<u>Objectives of the Pitch Abstract</u>

- Analysis on how SMAP product can provide feedback essential to making informed management decisions

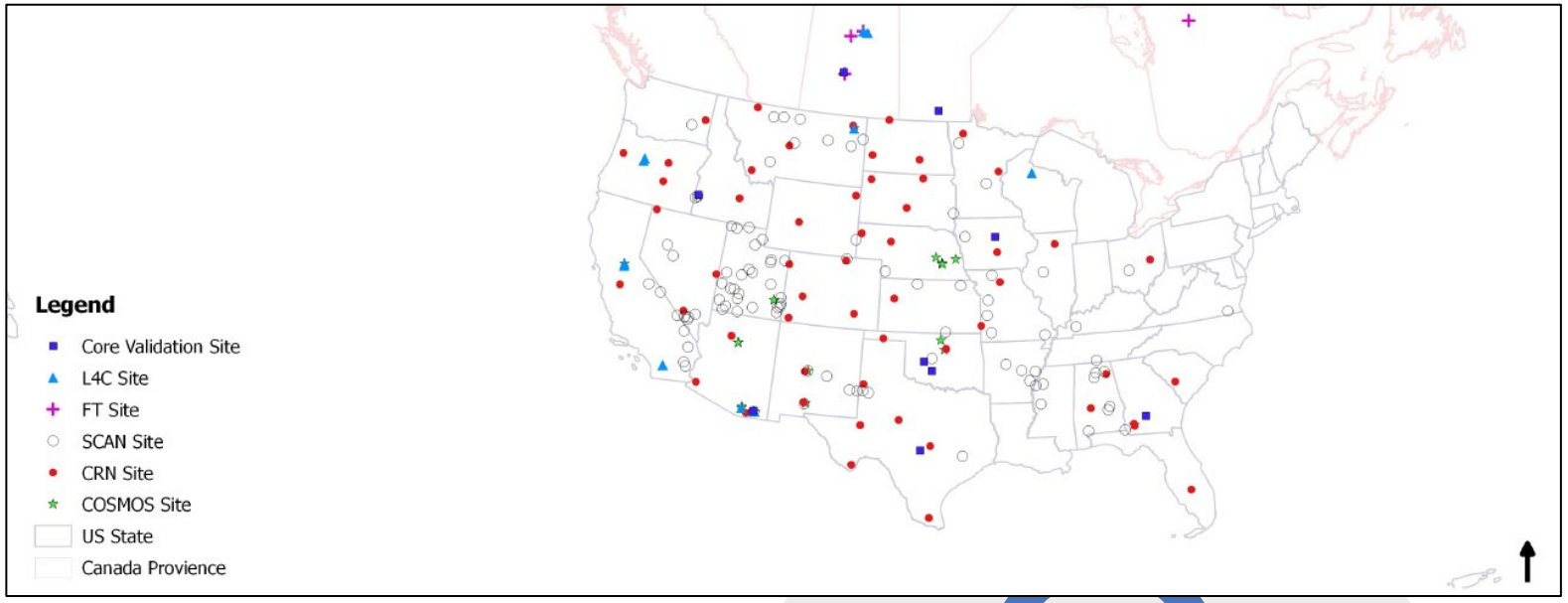
- Evaluation of SMAP product applied results in the field of rangeland management



(Photo credit: nnbw.com)

The Idea

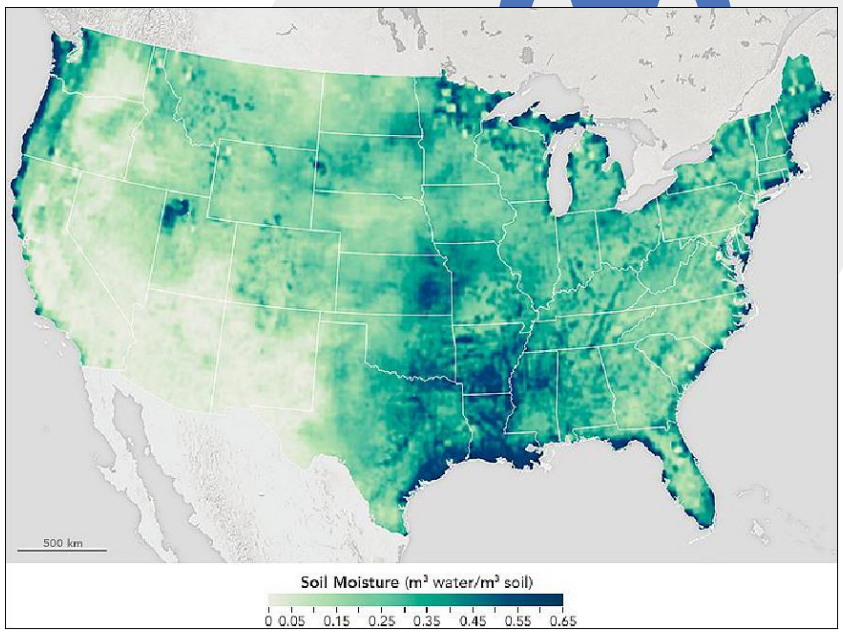
Fundamentals



Sparse network of soil moisture data

Vs

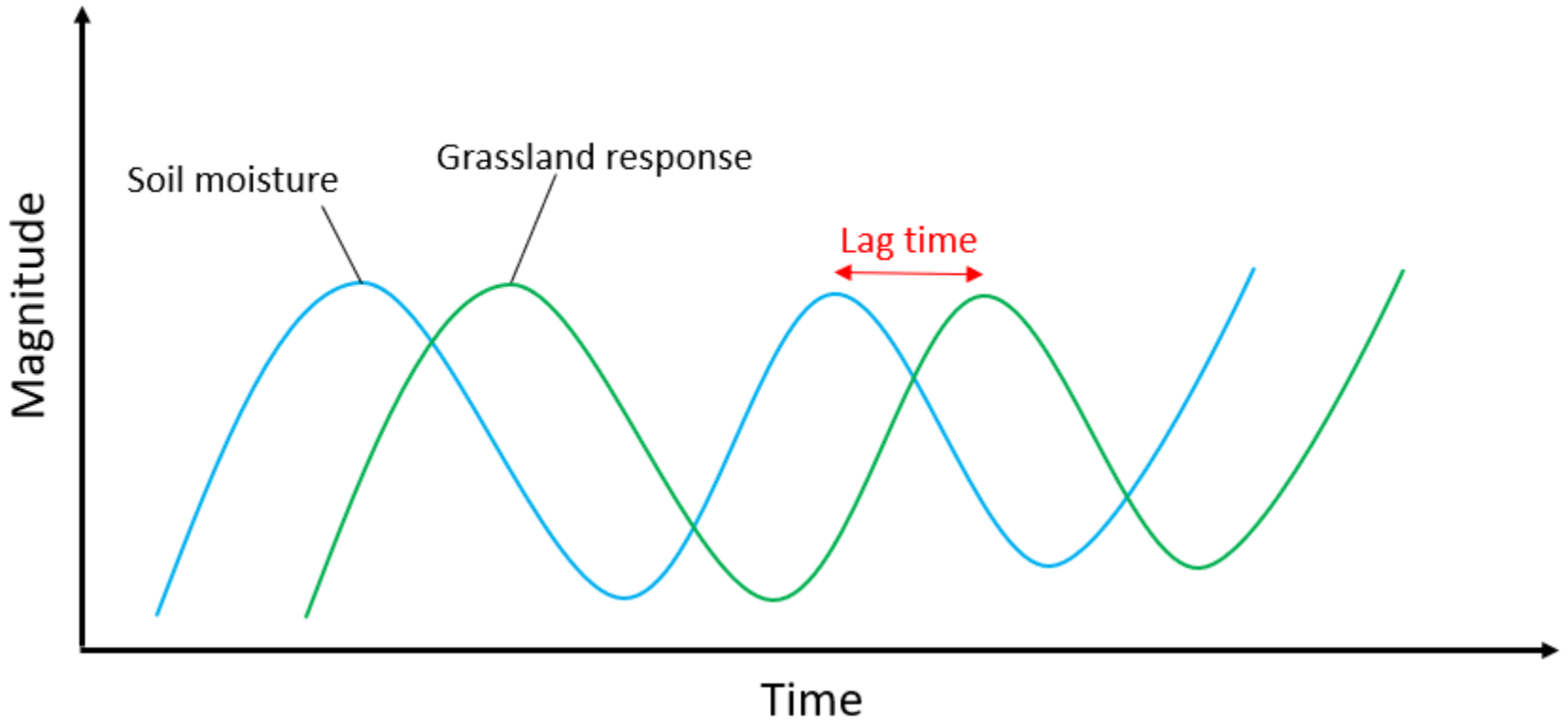
Spatially refined soil moisture data



(image credit: NASA Earth Observatory, Joshua Stevens and the SMAP science team)

The Idea

Fundamentals

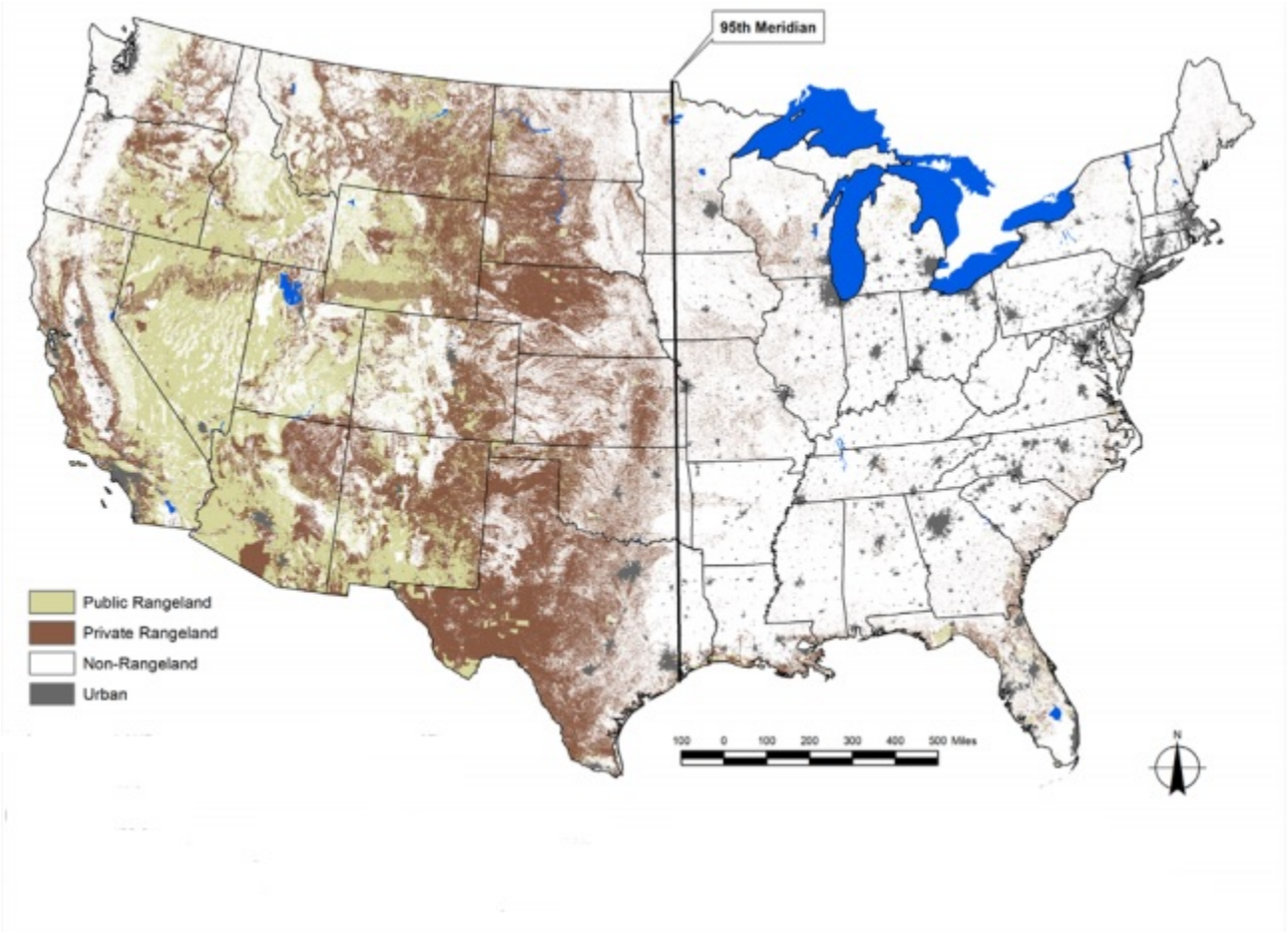


Lag effect on grassland response to change in soil moisture

The Idea

Potential Application

(Map source: USDA Forest Service RMRS-GTR-382. 2018)



Estimating and accounting rangeland yield in space and time with SMAP data

Issue(s) being addressed

- Relation between soil moisture and rangeland yield
- Application of satellite-based soil moisture data for estimating rangeland yield
- Relation between soil moisture and pasture turn-out date

The Idea

Issues Addressed

What EO data does your idea utilize?

The Idea

- **SMAP - L4 Root Zone Soil Moisture (RZSM) Product**
- **MODIS**
- **VIIRS**

Earth Observation Tools

The Idea – Outcomes / Societal Benefits

- Tool for estimating rangeland yield from SMAP soil moisture data
- Future potential application of SMAP data in rangeland management
  - Climate and drought monitoring
  - Wildfire impact analysis

Thank You!