Pocatello, Idaho (BLM at ISU)

Southeast Idaho Disasters II

Where have all the Junipers come from?

File name: 2016Spring\_ID\_SEIdahoDisastersII\_VPS

00.05-00.34 (Cody O’Dale)

Two of the most pronounced vegetation changes throughout the intermountain west is the expansion of juniper and the invasion of cheatgrass, a noxious weed.

Juniper is native shrub species that has expanded from its traditional fire-safe habitats into fire-dependent communities. Recent estimates have placed contemporary juniper stands at 18 million hectares. This increase in fuel loads has changed fire regimes and intensified the severity of wildfires throughout this region.

00.35 – 00.45 (Jenna Williams)

Cheatgrass can outcompete native vegetation for available soil moisture and nutrients due to its ability to grow quickly in late fall and early spring, reproduce and rapidly sinesse.

00.46 – 01.09 (Cody O’Dale)

Both of these species are primary drivers of change in native semi-arid savanna ecosystems and play a large role in changing fire regimes. Though fire often plays an essential role in wildland ecology and helps maintain natural processes, too many occurrences of wildfire can induce a loss of biodiversity, disrupt ecosystems, and deplete resources.

01.10 – 2.27 (Jenna Williams)

Leveraging different earth observations The Southeast Idaho Disasters II team partnered with the Bureau of Land Management, Idaho Fish and Game, and Caribou-Targhee National Forest to see how remote sensing can help analyze what these land managers are seeing on the ground and extracting that to a larger landscape level.

To try and understand where juniper has most actively encroached over time in southeast Idaho this project utilized Landsat 5 and 8 data downloaded from USGS Earth Explorer in five year increments starting in1985 through 2015. Using the historic fire dataset compiled by NASA and the GIS TReC center at ISU, our team removed vegetation points that may have burned prior to running a classification tree on each Landsat image.

Using SMAP’s passive radiometer dataset, this project compared soil moisture for the 2015 growing season. Changes in soil moisture affects fire intensity—the degree to which the heat of a fire impacts the soil, seed bank, and stand structure.

Using the National Gap Analysis Program land cover dataset we preformed zonal statistics to identify the type of land cover that made up the majority of each pixel.

2.28 – 3.13 (Kshitiz

To try and predict change and identify transition zones from sage-brush into juniper we used TerrSets Land Change Modler. To test the model we forecasted to 2015, where we had a known classification. The results were inconclusive therefore we could not predict change into the future with any certainty.

We also extracted only the classified junipers from each CTA and preformed binary raster calculations to identify areas that have seen juniper expansion. These results can help to identify areas that may need fuel reduction or management.

A longer temporal analysis may prove to be useful when trying to characterize juniper encroachment due to the slow growth rate of this species.

3.14 – 4.02 (Jenna Williams)

SMAPs soil moisture results show that May had the largest amount of precipitation. High precipitation in the early growing season can lead to a buildup of fuel especially in annual grasses. This coupled with high temperatures can dry out these fuels and create for a big fire season. Due to the large pixel size of the passive sensor on SMAP we were unable to determine differences in specific vegetation types on a finer scale. The introduction of finer resolution data for soil moisture analysis would be beneficial in further understanding of fire susceptibility in this region.

As wildfires continue to grow understanding of how remote sensing can be used to provide different types of information on a larger special scale is beneficial for our land managers in many different aspects of planning, fuels management, and land restoration.