Abstract
New-native invasive grass species such as Bromus rubens and Bromus rubens (annual brome) negatively impact the native ecosystem of the Mojave Desert. Not only do these grasses present the growth of native plant species, they also serve as highly flammable fuels that increase the frequency and scale of devastating wildfires. Using remote-sensed Landsat data, locations of known annual brome presence, annual brome growth, and historical fire boundaries, this project serves to accurately identify and map the current extent of annual brome within Joshua Tree National Park in order to reduce fire management and vegetation management efforts.

Client
The project’s primary client is the BASF Corporation. This multinational chemical corporation promotes the Healthy Pla茨n (blueprint). Pla茨n was used in both modeling and vegetation suppression applications, and in creating the brome management plan. Pla茨n can’t be used as a fire management solution because it is able to prevent annual brome from growing, thus creating fire breaks.

The secondary client is Joshua Tree National Park (JTNP). The National Park Service recognizes cheatgrass (Bromus tectorum) and red brome (Bromus rubens) as two of the main factors in shortening the natural fire cycle in the Mojave from 500 years to between 5 and 10 years. The project’s study area is in the northwestern Mojave Desert area within JTFP due to its vulnerability to annual brome.

Goals and Objectives
The goal of this project was to build upon previous annual brome studies and create a tool to protect national park land from devastating wildfires. The objectives of the project were to provide a current extent of annual brome within JTFP and to map areas of human disturbance and historic fire disturbance so that these areas can be identified and mitigated.

Methods (cont.):

Relative increase in growth from dry year to wet year using soil adjusted indices

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This project used annual brome presence data provided by JTFP to verify the analysis.

In the top image (G124), most of the brome points fell on areas of amplified response, but there were very few that occurred in areas of a large difference in NDVI. In the bottom image (G149), there were a few points of amplified response but the majority of points fell on areas of no-change. These results did not validate the assumption that amplified response to rainfall indicates the presence of annual brome. A more thorough vegetation sampling of the park could validate these results.

Wildfires are known to promote the invasion of annual brome. A visual analysis was completed to determine the best method for modeling the continuous spread of annual brome. Bradley and Mustard’s (2005) methods of using Landsat data to calculate the difference in vegetation indices were chosen.

This project successfully

Results
A map interface was developed to display the analytic results so that the client could explore and understand the data. The interface is organized by decade, allowing the user to view through time, looking at park conditions during different time periods. Included in the interface are the vegetation indices and the vegetation index-difference, the annual brome presence data provided by JTFP, historic fire boundaries, and areas of human disturbance.

Conclusions:
This project successfully

References