A Drought Reporting Tool on the Navajo Nation: *Impacts*

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Desert Research Institute

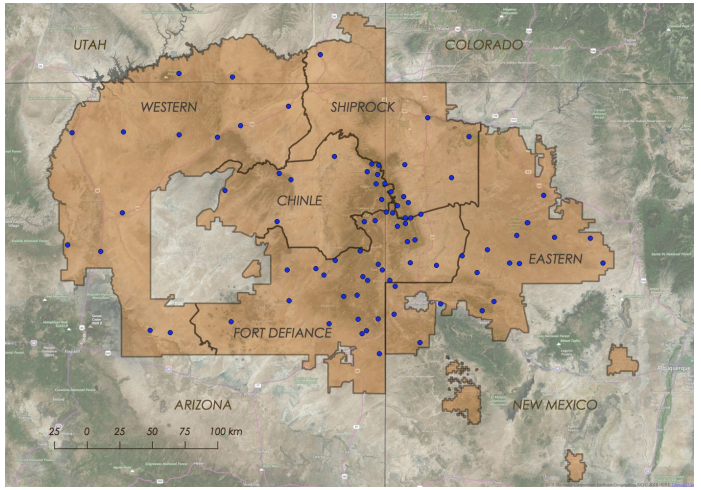

UTAH
Dibé Nitsaa Big Mountain Sheep (Hesperus Mountain)
COLORADO
Tsisnaasjini' (Blanca Peak)
The Navajo Nation
Doko'oosliid (San Francisco Peaks)
Tsoodzil (Mount Taylor)
ARIZONA
NEW MEXICO

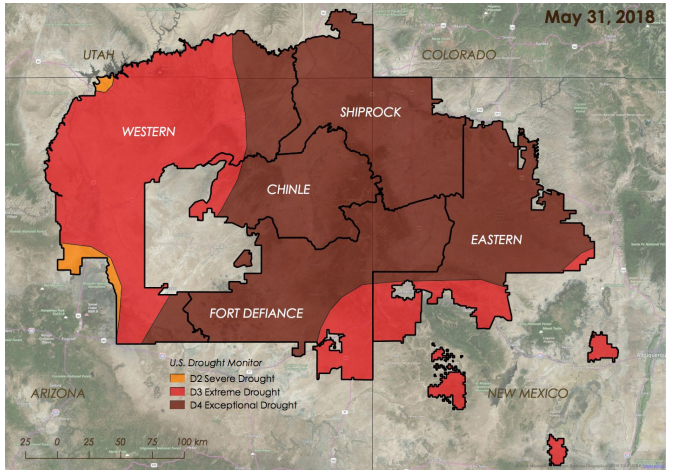
Water Supply and Reporting Challenges

Low reliability and direct access to water

Highly variable climate and precipitation patterns

Limited in-situ data





Single drought metric used in emergency declarations

Goals for Impact:

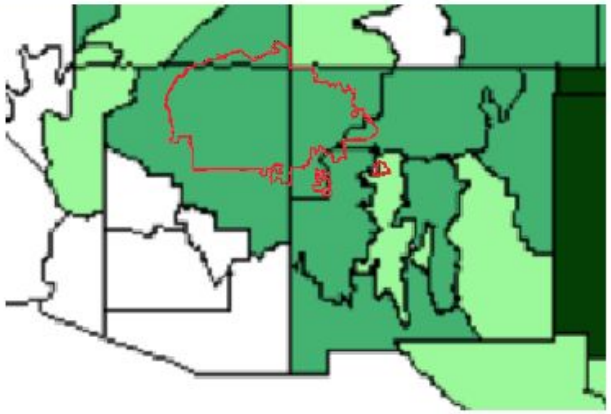
1. Provide information for appropriate allocation of drought relief dollars to regions on the N.N. with the greatest need through improved drought reporting

2. Build the capacity for the N.N. to use Earth Observations for natural resource management

NAVAJO NATION DROUGHT STATUS REPORT

NN Dept. of Water Resources, Water Management Branch

P.O. Drawer 678 Fort Defiance, Arizona 86504 Ph. (928) 729-4004, Fax (928) 729-4126



- +3.00 and above (exceptionally wet)
- +2.00 to +2.99 (extremely wet)
- +1.25 to +1.99 (very wet)
- +0.75 to +1.24 (moderately wet)
- -0.74 to +0.74 (near normal)
- -1.24 to -0.75 (moderately dry)
- -1.99 to -1.25 (very dry)
- -2.99 to -2.00 (extremely dry)
- -3.00 and below (exceptionally dry)

6-Month SPI for August 2015 www.wrcc.dri.edu

Navajo Nation Drought Stage

Location	6 month SPI August	Stage as of August
NE AZ	1.3	Alert
NW NM	1.36	Normal
SE UT	1.87	Normal

Drought Intensity Category

NN Drought	*US Drought*	
Normal	Normal	D0
Alert	Moderate	D1
Warning	Severe	D2
Emergency	Extreme/Exceptional	D3 & D4

Intensity:

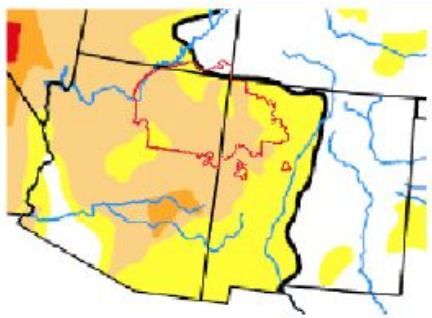
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

Drought Impact Types:

~ Delineates dominant impacts

S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)



September 30, 2015 U.S. Drought Monitor http://droughtmonitor.unl.edu/

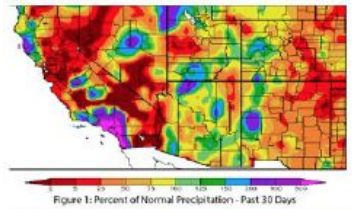


Figure 1: Percent of Normal Precipitation - Past 30 Days

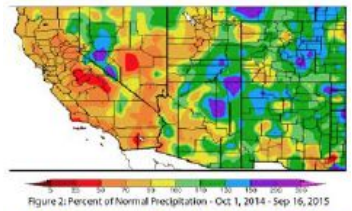


Figure 2: Percent of Normal Precipitation - Oct 1, 2014 - Sep 16, 2015

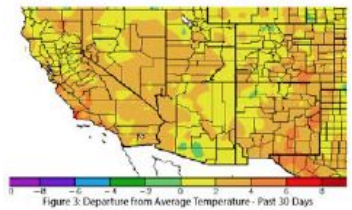


Figure 3: Departure from Average Temperature - Past 30 Days

Figure 4: Division Average Temperature Ranks - Jan - Aug 2015

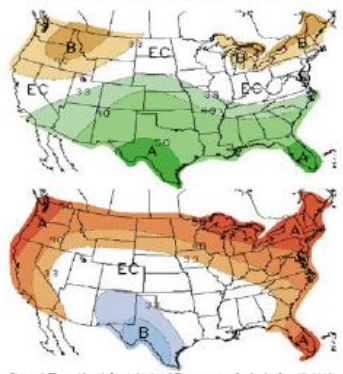


Figure 5: Three-Month Precipitation & Temperature Outlook - Sep 17, 2015

Climate Engine

ABOUT TOOL DATA EXAMPLES TESTIMONIALS PUBS NEWS TEAM CONTACT

On-Demand Cloud Computing and Visualization of Climate and Remote Sensing Data

Analyze and interact with climate and earth observations for decision support related to drought, water use, agricultural, wildfire, and ecology

LAUNCH THE WEB APPLICATION

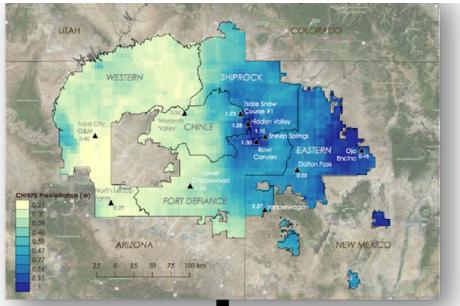
Drought Monitoring

Agriculture & Ecosystems

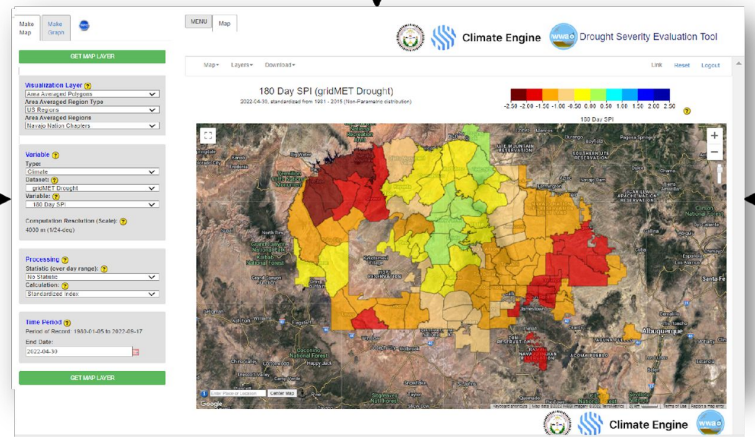
Wildfire

Navajo Nation Drought Severity Evaluation Tool (DSET)

Navajo Rain Gauge Data



Modeled Data and Drought Indices



Drought Severity Evaluation Tool (DSET)

Climate Engine

wwao DRI Desert Research Institute

- Goal to improve upon drou reporting for the Navajo Nation Department of Water Resources
- Partner-driven tool where co-development and sustained relationships were key
- Acknowledgment of preexisting Indigenous knowledge systems and capacity building efforts ensured continued use of the tool
- User guide link

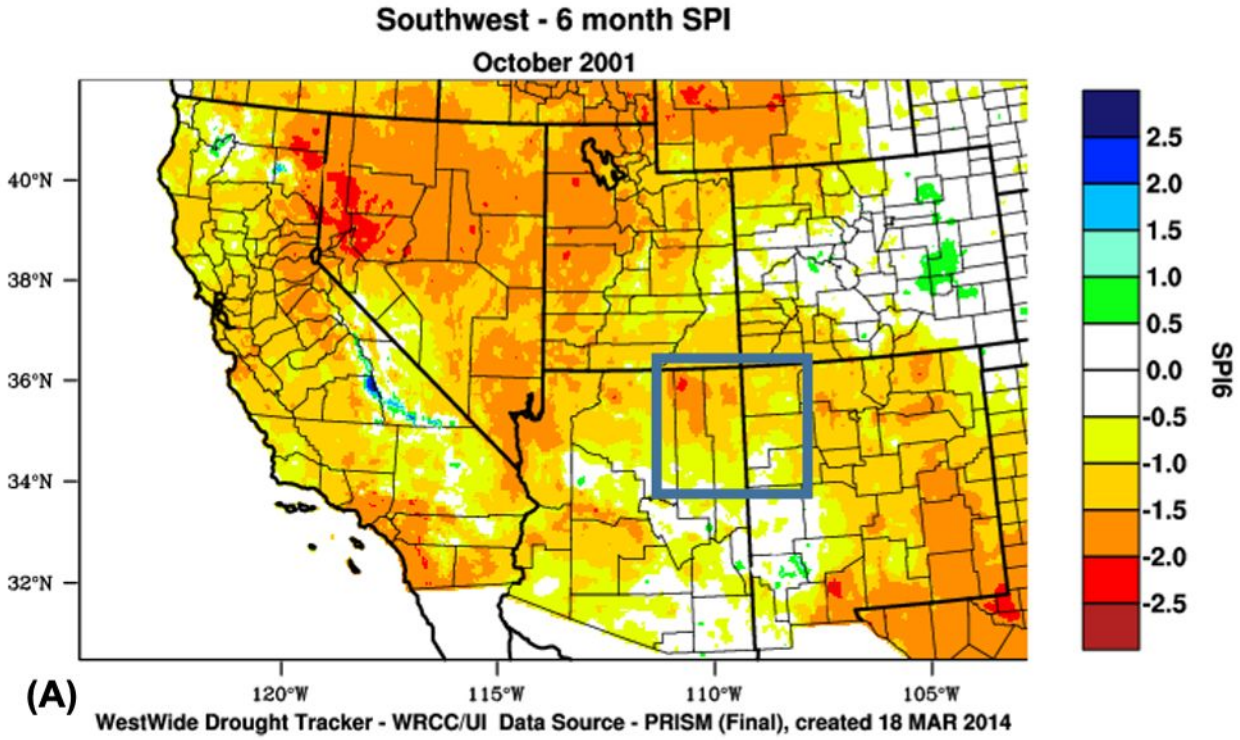
"I'm...Navajo – I grew up on the Navajo Reservation. It is monumental to have an organization like NASA work with us to diversify and augment the water tools we have at our disposal."

Carlee McClellan, Navajo Nation Department of Water Resources

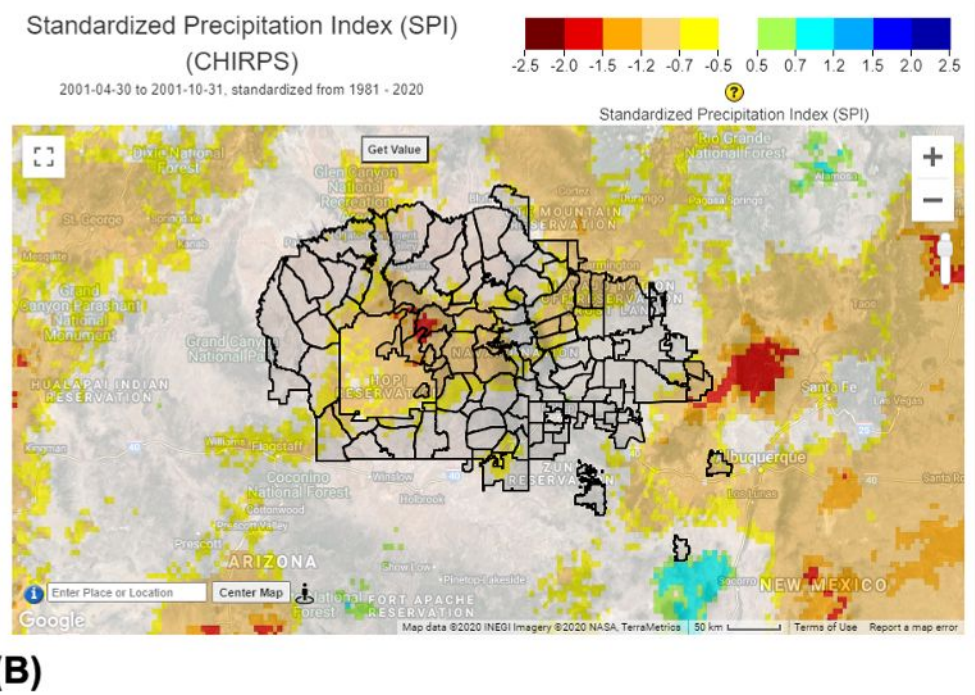
GOAL: Improved Reporting to Support Drought Declarations

Outcome: Increased spatial resolution of 6-month SPI values in report maps

BEFORE

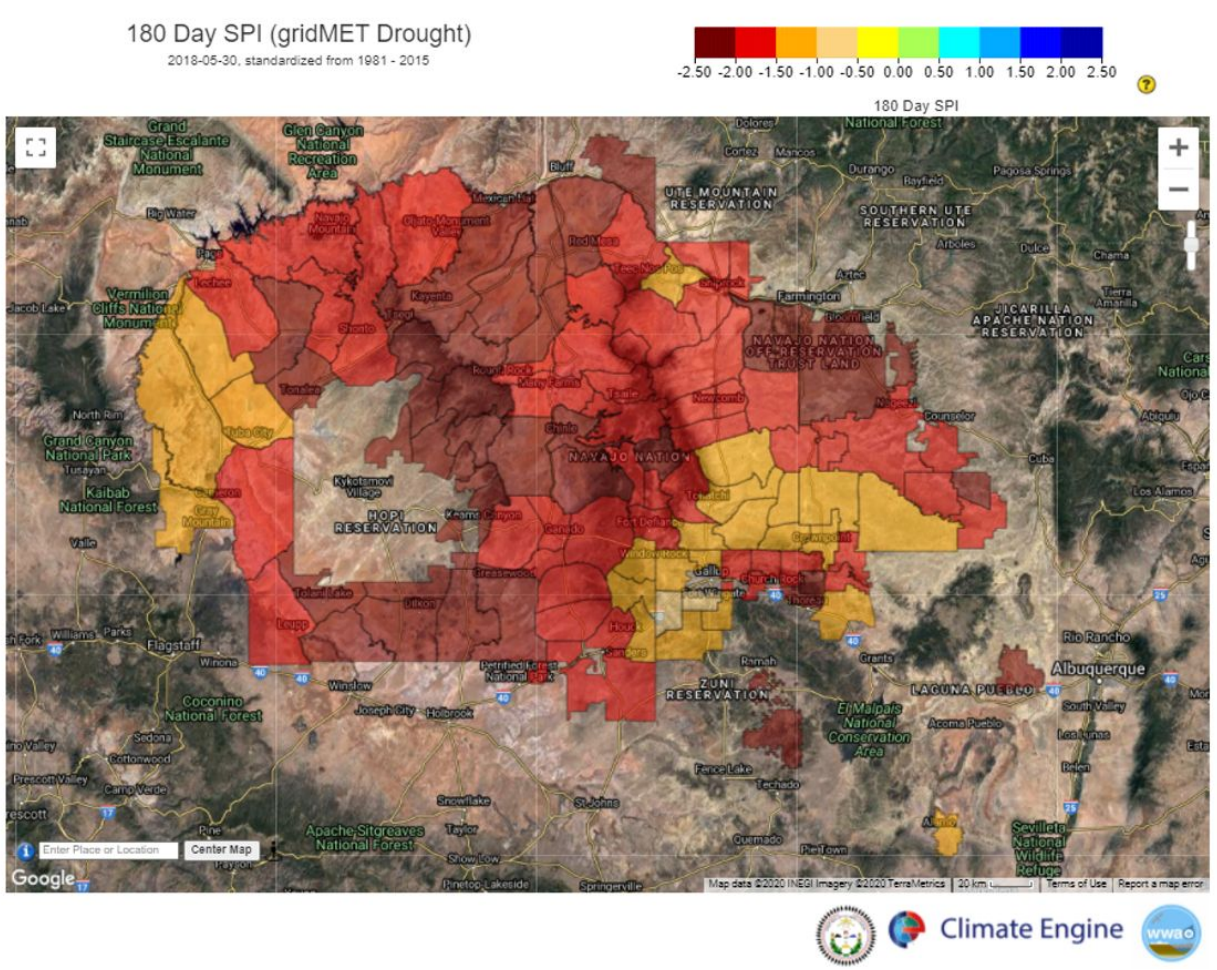


AFTER



GOAL: Improved Reporting to Support Drought Declarations

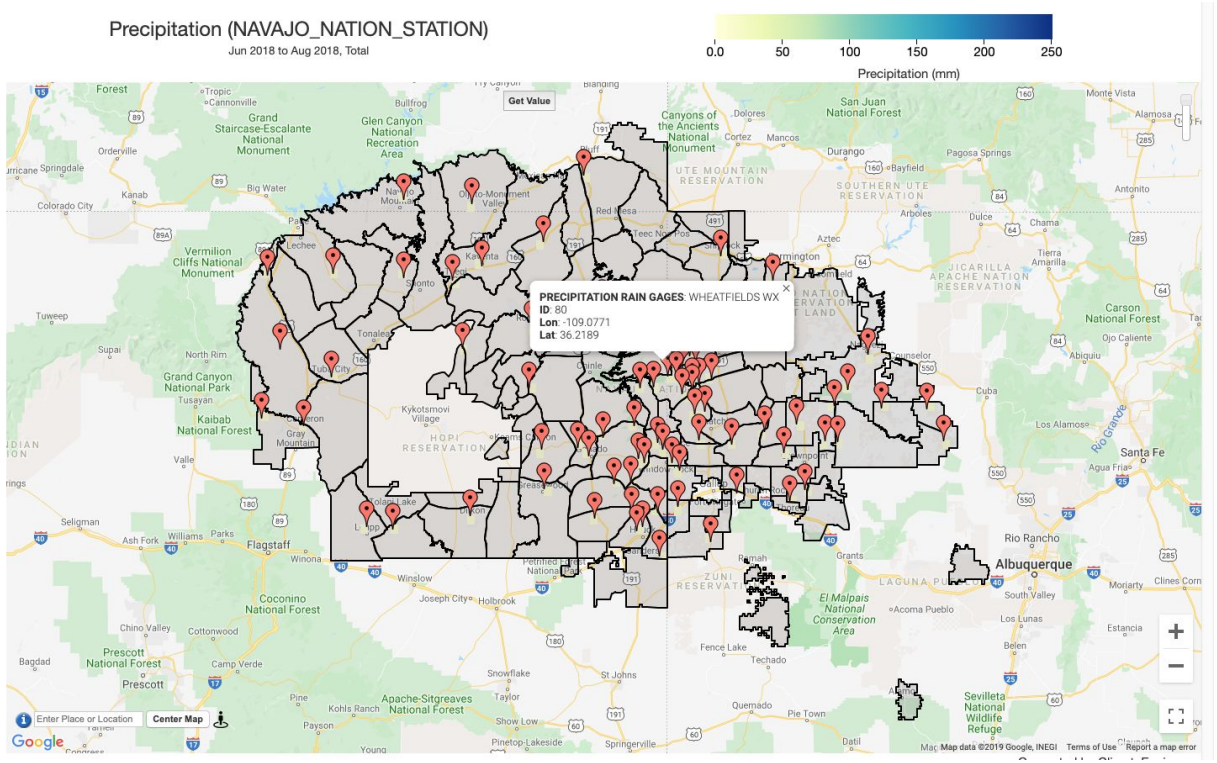
Outcome: Ability to map SPI values for individual Chapters

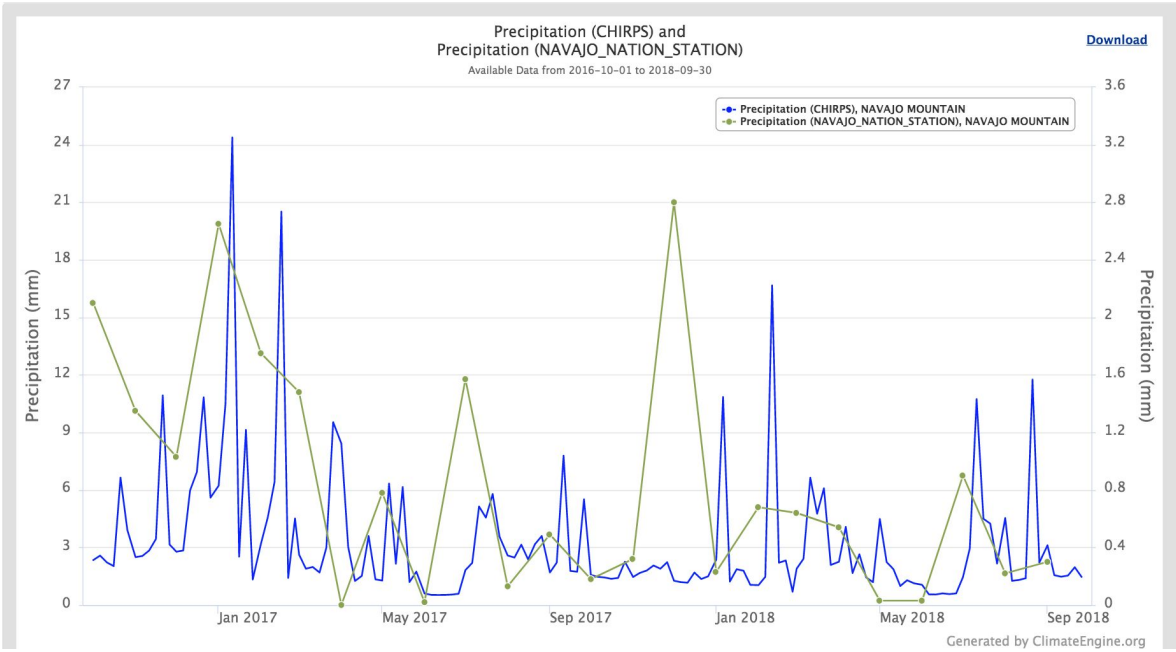


Outcome: Inclusion of new SPI maps in Navajo Nation Drought Reports

GOAL: Improved Reporting to Support Drought Declarations

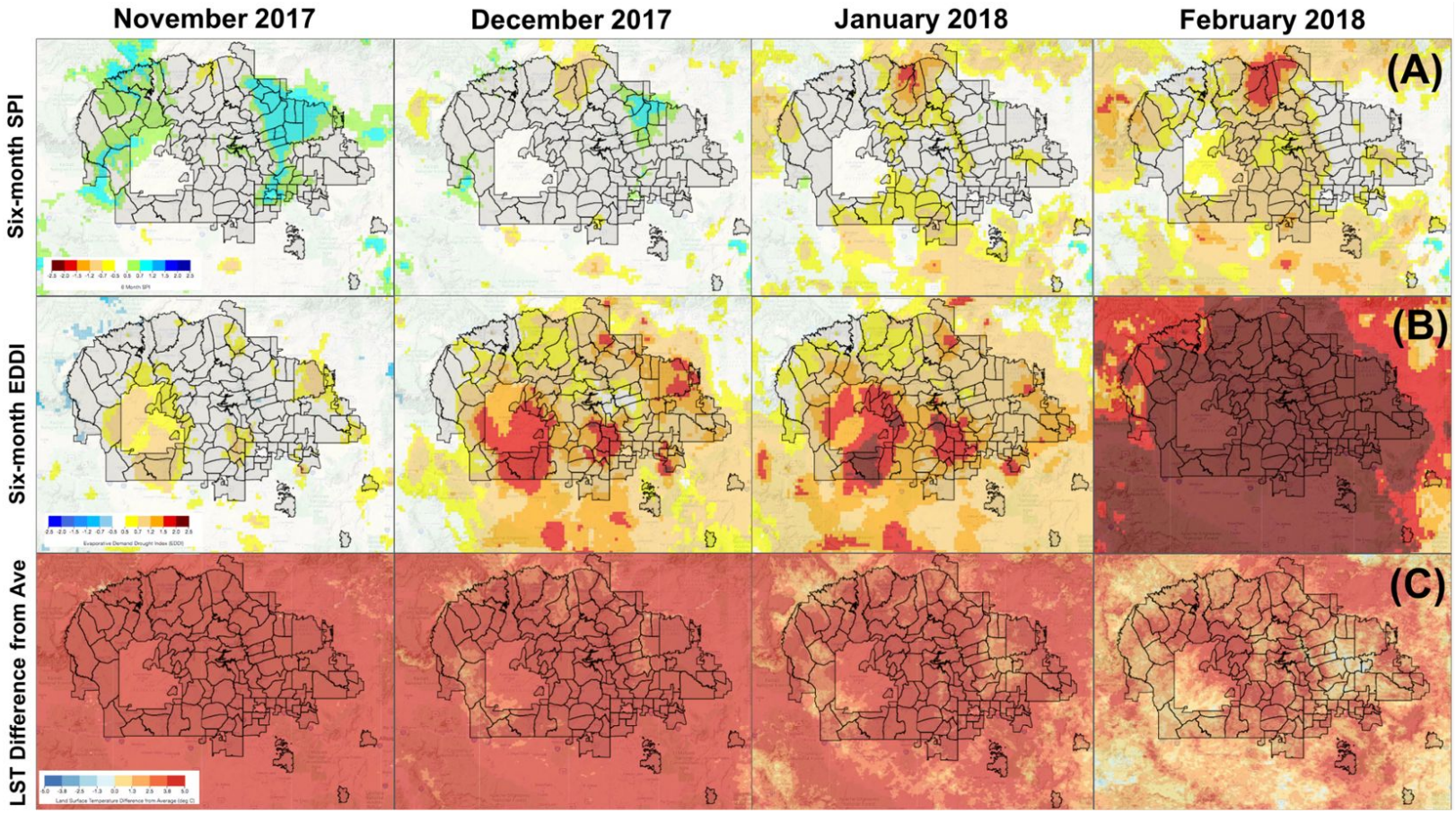
Outcome: Ability to compare Navajo rain gauge data to drought indices and models





GOAL: Improved Reporting to Support Drought Declarations

Outcome: Consideration of additional metrics in drought assessment



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Outcome: Increased spatial resolution of 6-month SPI values in report maps

Outcome: Ability to map SPI values for individual Chapters

Outcome: Inclusion of new SPI maps in Navajo Nation Drought Reports

Outcome: Consideration of additional metrics in drought assessment

Outcome: Ability to compare Navajo rain gauge data to drought indices and models

IMPACT: Improved ability to declare a drought emergency when any portion of the Navajo Nation is experiencing 6-month SPI levels -1.5 or below

GOAL: Build Capacity within the Navajo Nation

Action: Two in-person partner beta testing and training sessions

- April 2019: 2-Day hands-on training in Flagstaff, AZ
- Multiple Navajo Nation Natural Resources Departments
- Feedback/Discussion session

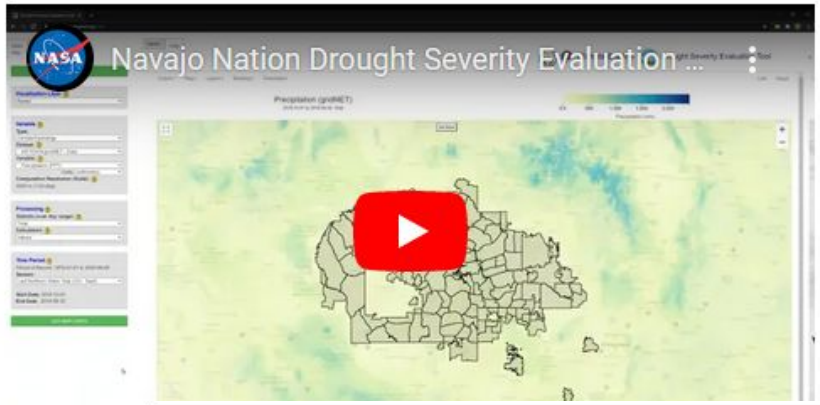
Dec 2019: 1-Day hands-on training in Window Rock, AZ

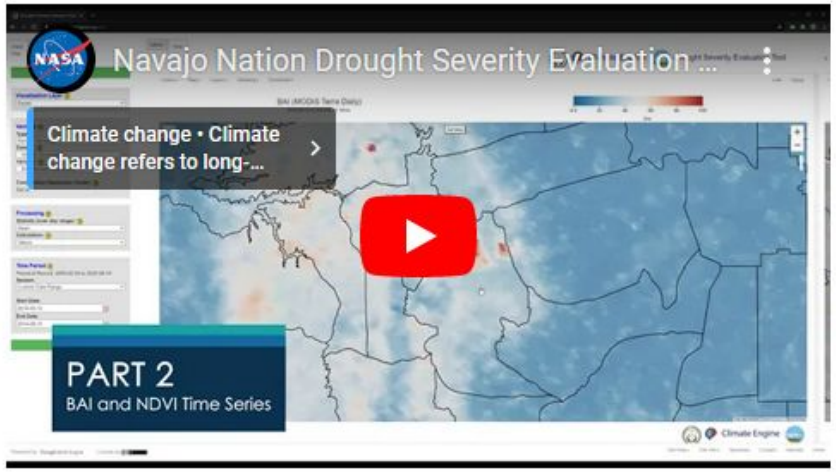
Outcome: Modified features of DSET tool to meet partner needs

Outcome: Increase understanding of DSET and uses of EO for natural resource mgmt.

GOAL: Build Capacity within the Navajo Nation

Action: Development of DSET Introductory video and User Guide





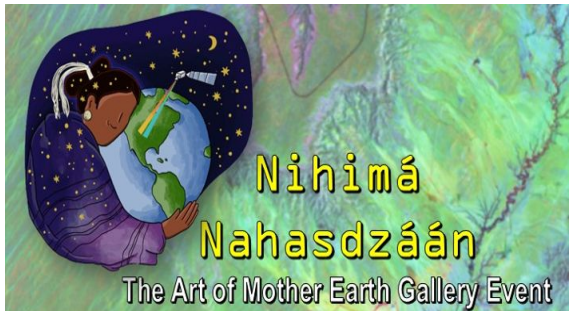
Outcome: Increase understanding of DSET and tool visibility to other Tribes

GOAL: Build Capacity within the Navajo Nation

Action: Continued training and outreach with NASA's Indigenous Peoples Initiative

Outcome: Increased use of DSET and Climate Engine beyond the Navajo Nation

Outcome: Interest in supporting long-term sustainability of DSET and expansion for other Tribes (NOAA/NIDIS)



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IMPACT: Increased use of NASA EO data/products/tools in Indigenous communities with potential for further expansion in relationships and geographies

Thank You

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