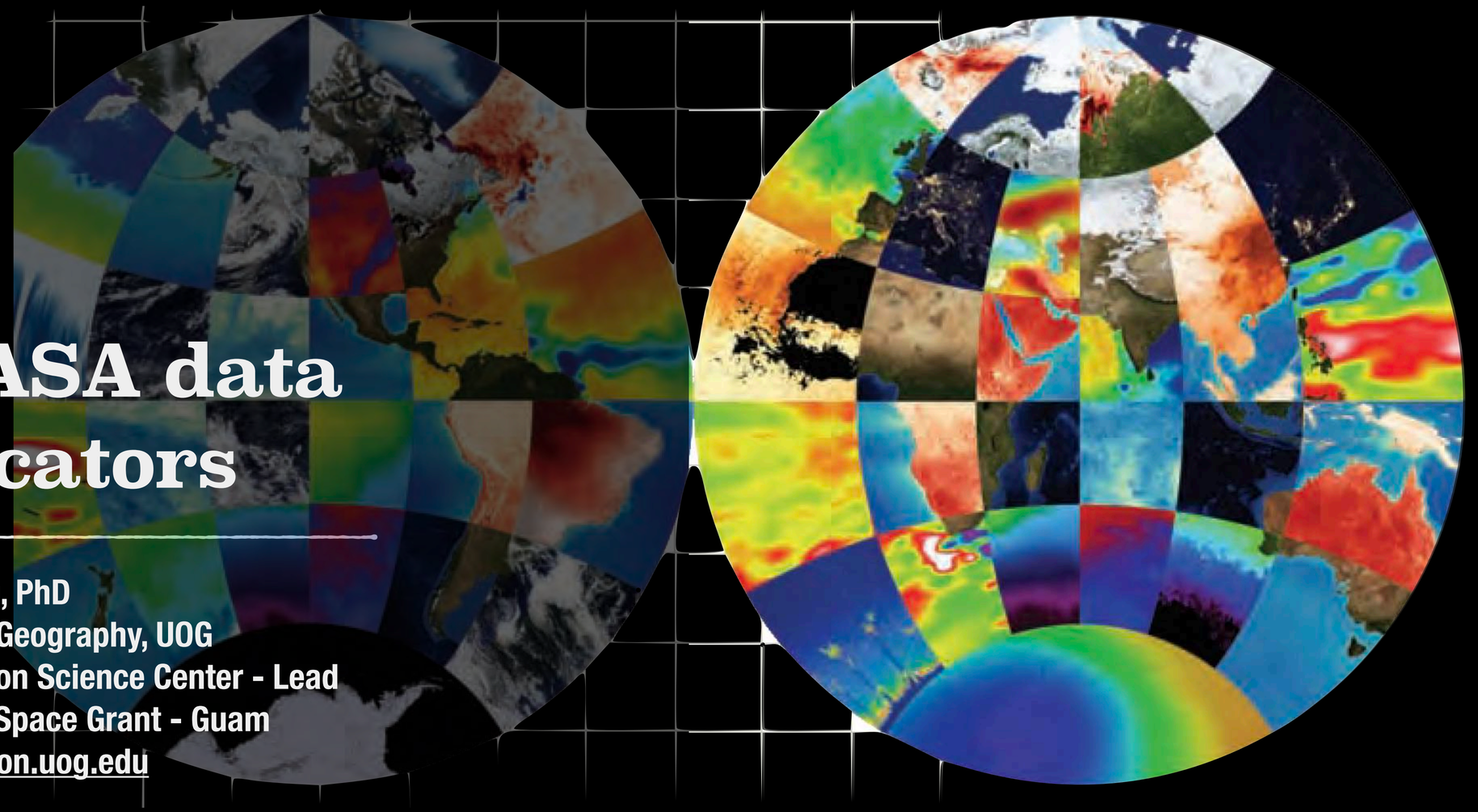
Maps & NASA data for Educators



Romina King, PhD
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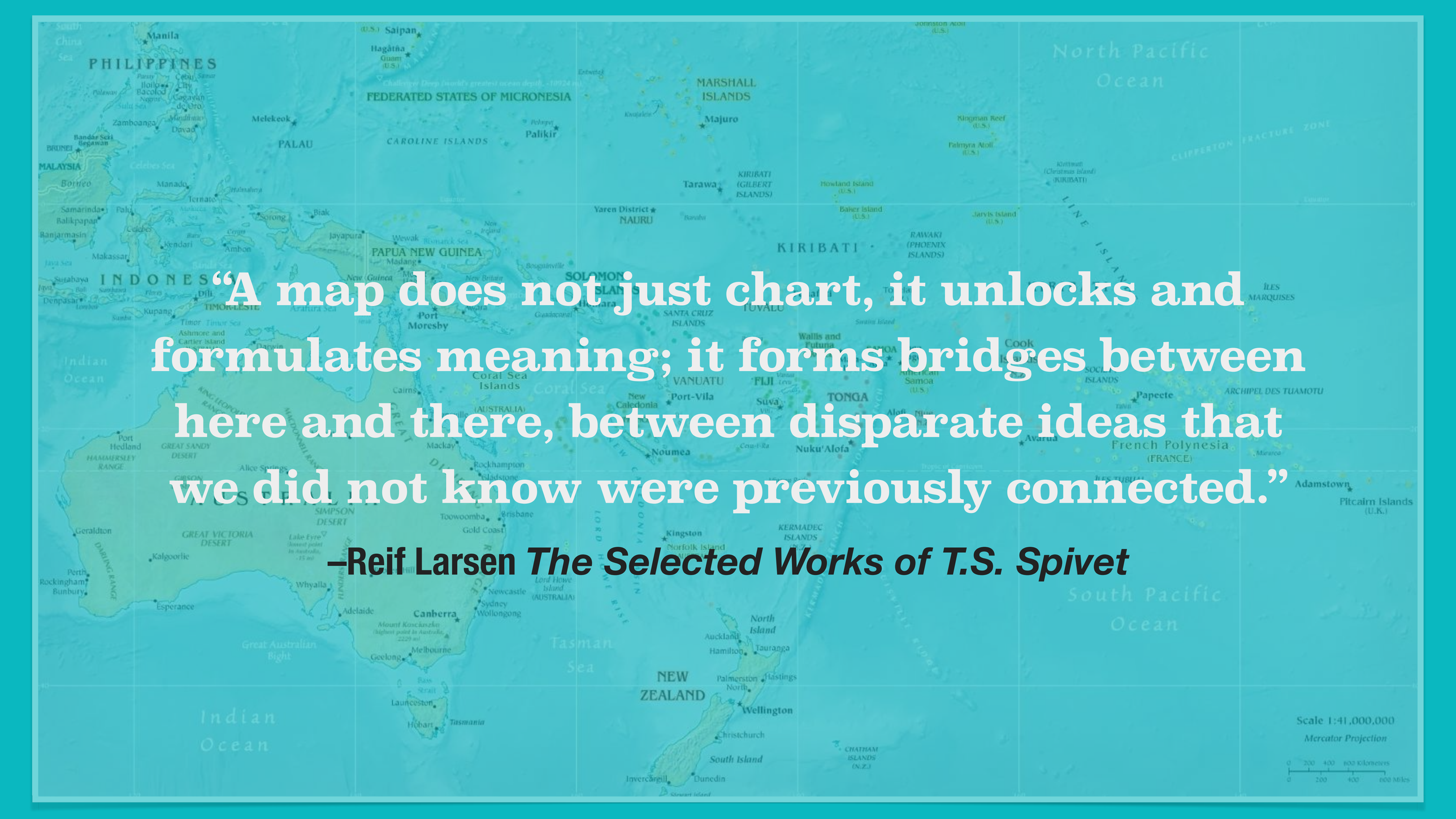
Soil and Water Educators Symposium
28 July 2021
University of Guam, Mangilao, GU



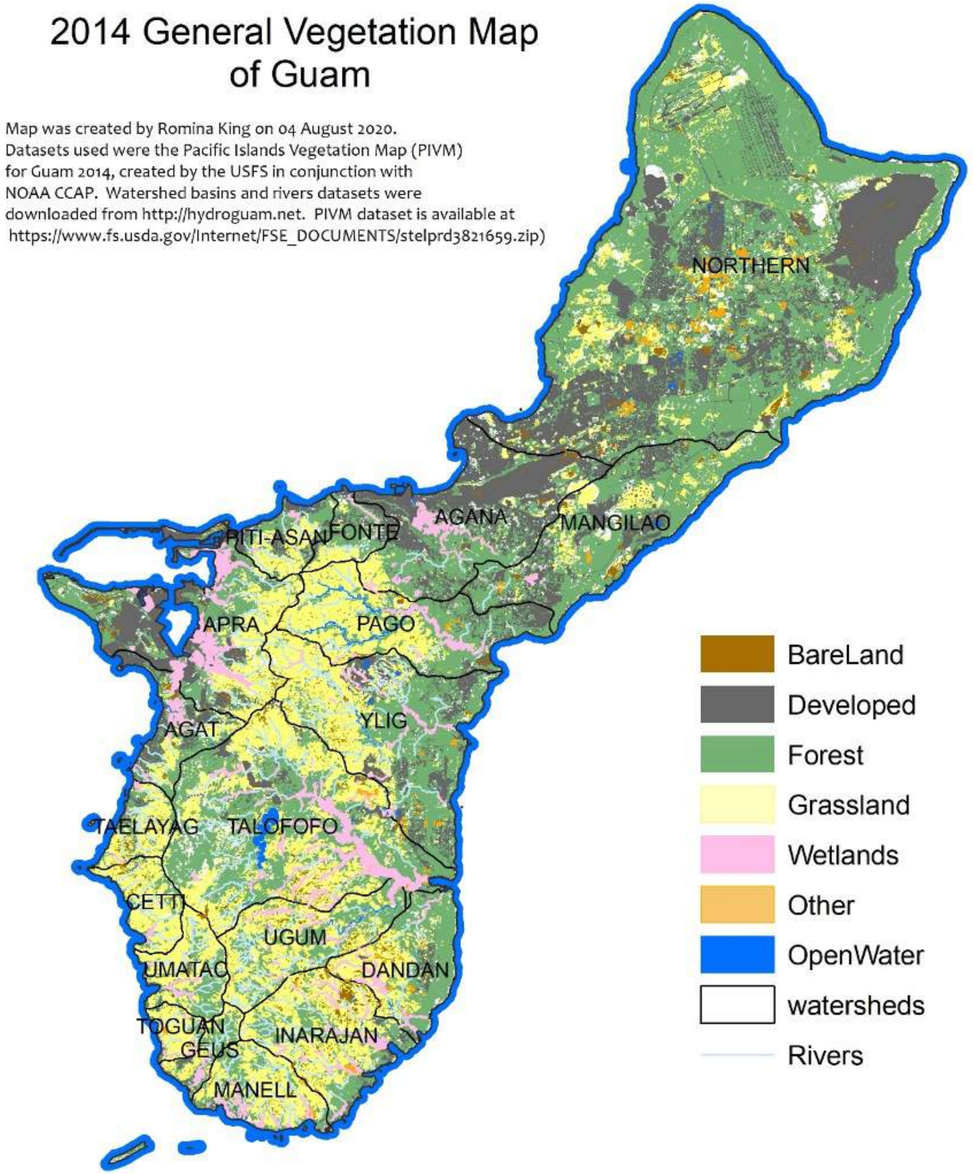
“A map does not just chart, it unlocks and formulates meaning; it forms bridges between here and there, between disparate ideas that we did not know were previously connected.”

–Reif Larsen *The Selected Works of T.S. Spivet*

Using maps to show landcover and forests on Guam

2014 General Vegetation Map of Guam

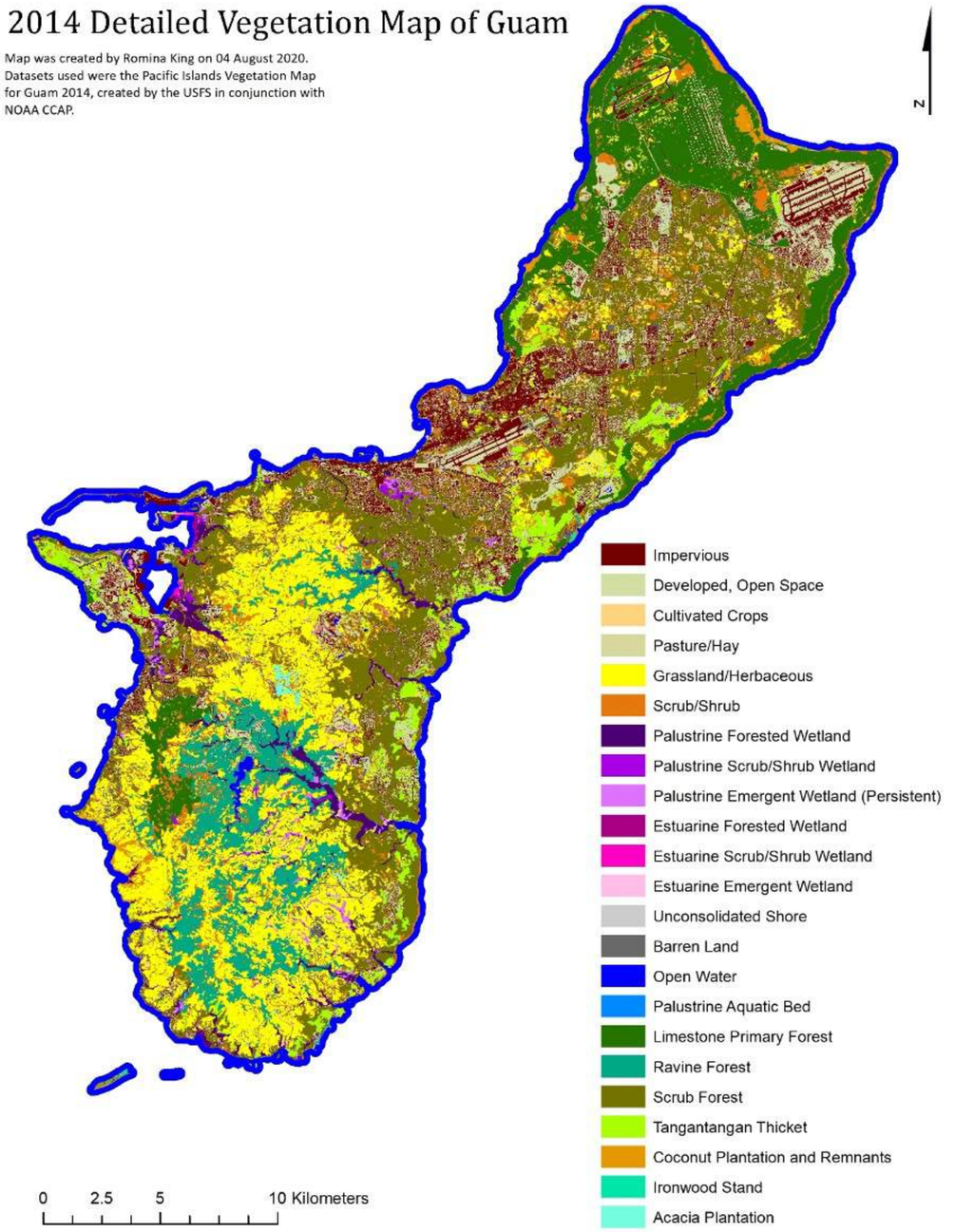
Map was created by Romina King on 04 August 2020.
Datasets used were the Pacific Islands Vegetation Map (PIVM) for Guam 2014, created by the USFS in conjunction with NOAA CCAP. Watershed basins and rivers datasets were downloaded from http://hydroguam.net. PIVM dataset is available at https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3821659.zip)



Healthy forests, healthy people - Where?

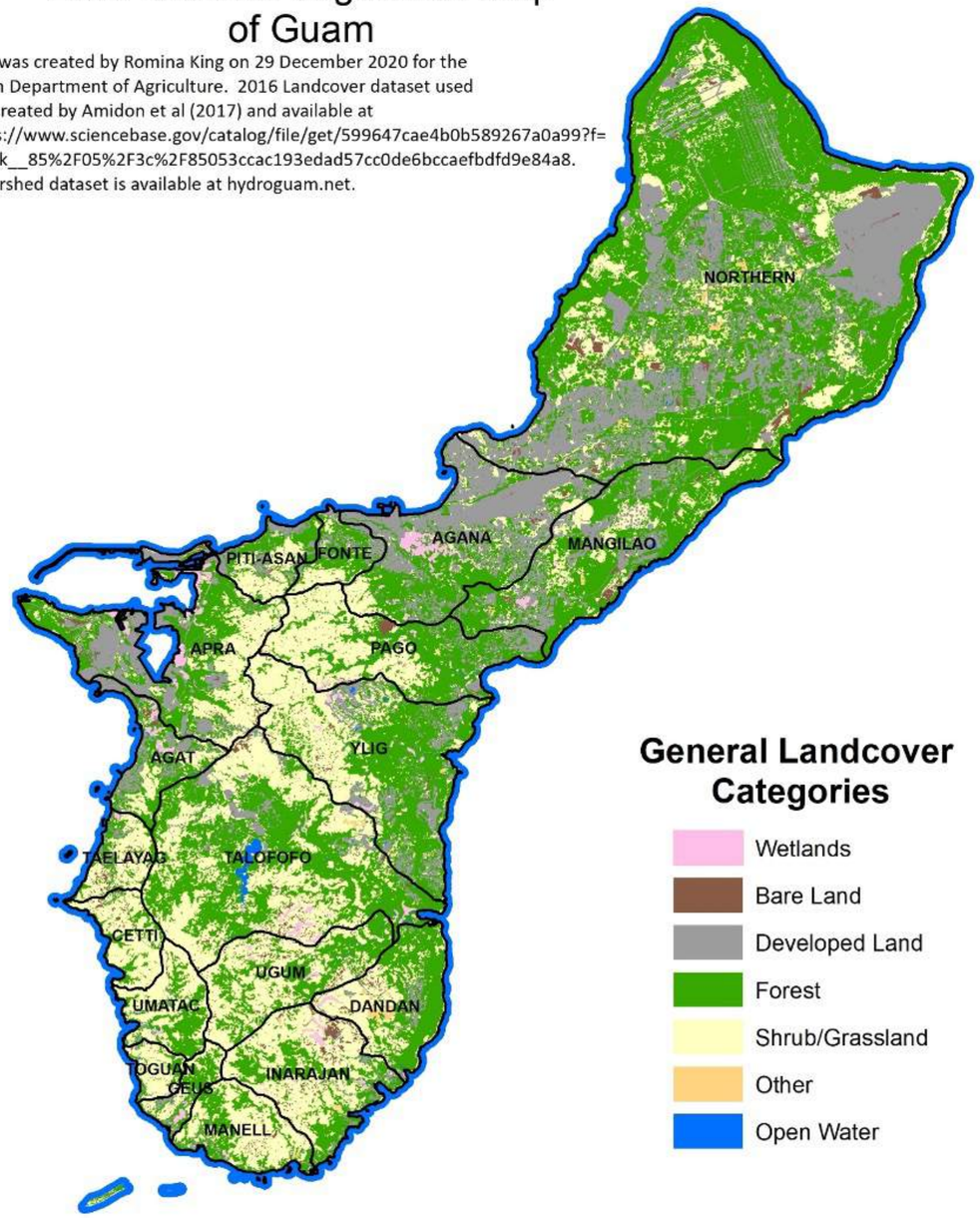
2014 Detailed Vegetation Map of Guam

Map was created by Romina King on 04 August 2020.
Datasets used were the Pacific Islands Vegetation Map for Guam 2014, created by the USFS in conjunction with NOAA CCAP.



2016 General Vegetation Map of Guam

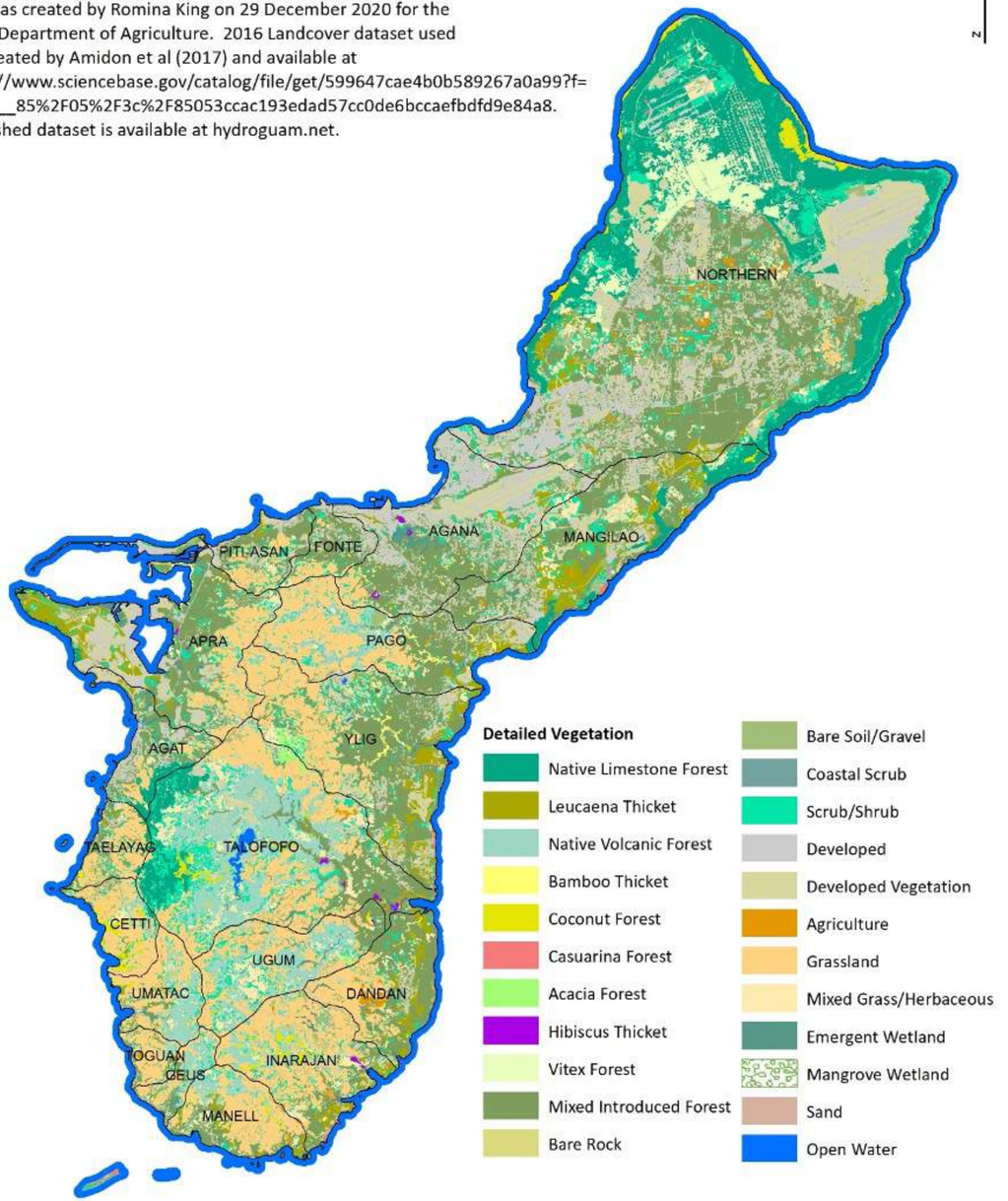
Map was created by Romina King on 29 December 2020 for the Guam Department of Agriculture. 2016 Landcover dataset used was created by Amidon et al (2017) and available at https://www.sciencebase.gov/catalog/file/get/599647cae4b0b589267a0a99?f=__disk__85%2F05%2F3c%2F85053ccac193edad57cc0de6bccaefbdfd9e84a8. Watershed dataset is available at hydroguam.net.



Do we see a change between 2014 and 2016?

2016 Detailed Vegetation Map of Guam

Map was created by Romina King on 29 December 2020 for the Guam Department of Agriculture. 2016 Landcover dataset used was created by Amidon et al (2017) and available at https://www.sciencebase.gov/catalog/file/get/599647cae4b0b589267a0a99?f=__disk__85%2F05%2F3c%2F85053ccac193edad57cc0de6bccaefbdfd9e84a8. Watershed dataset is available at hydroguam.net.



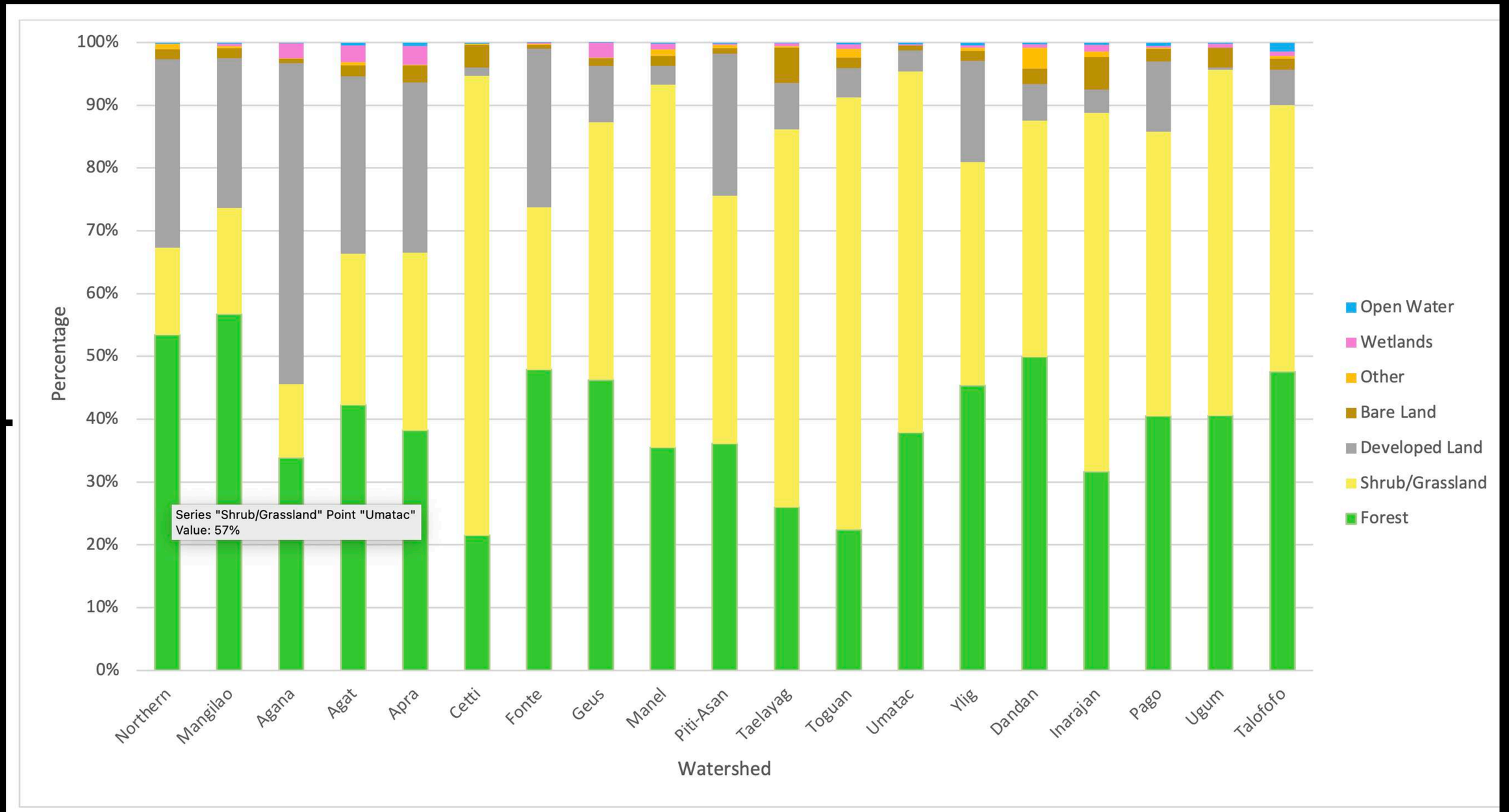
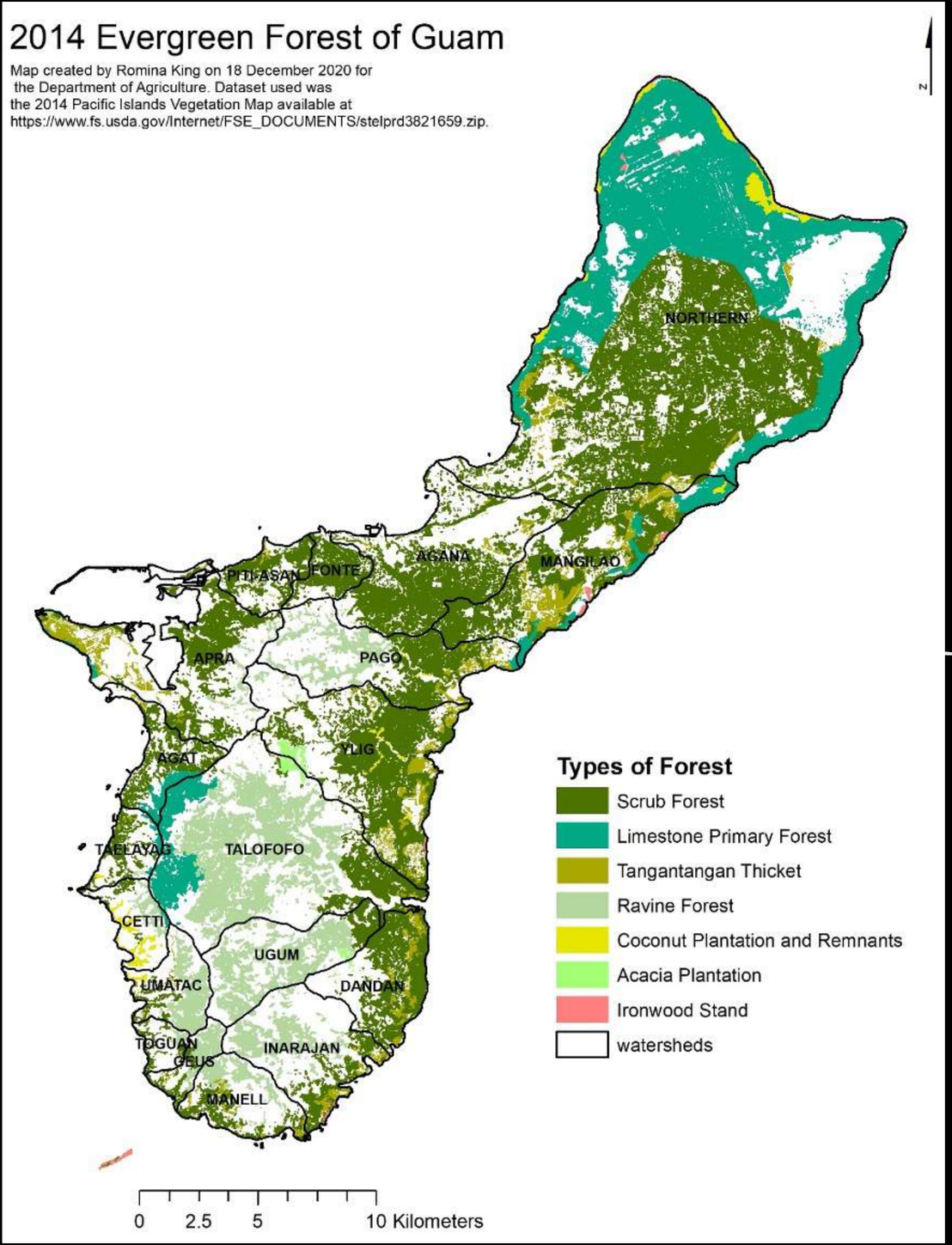


Figure 10. Bar graph showing the 2016 percentage of area landcover within each watershed. Data depicted in the graph are derived from the geospatial dataset of Amidon et

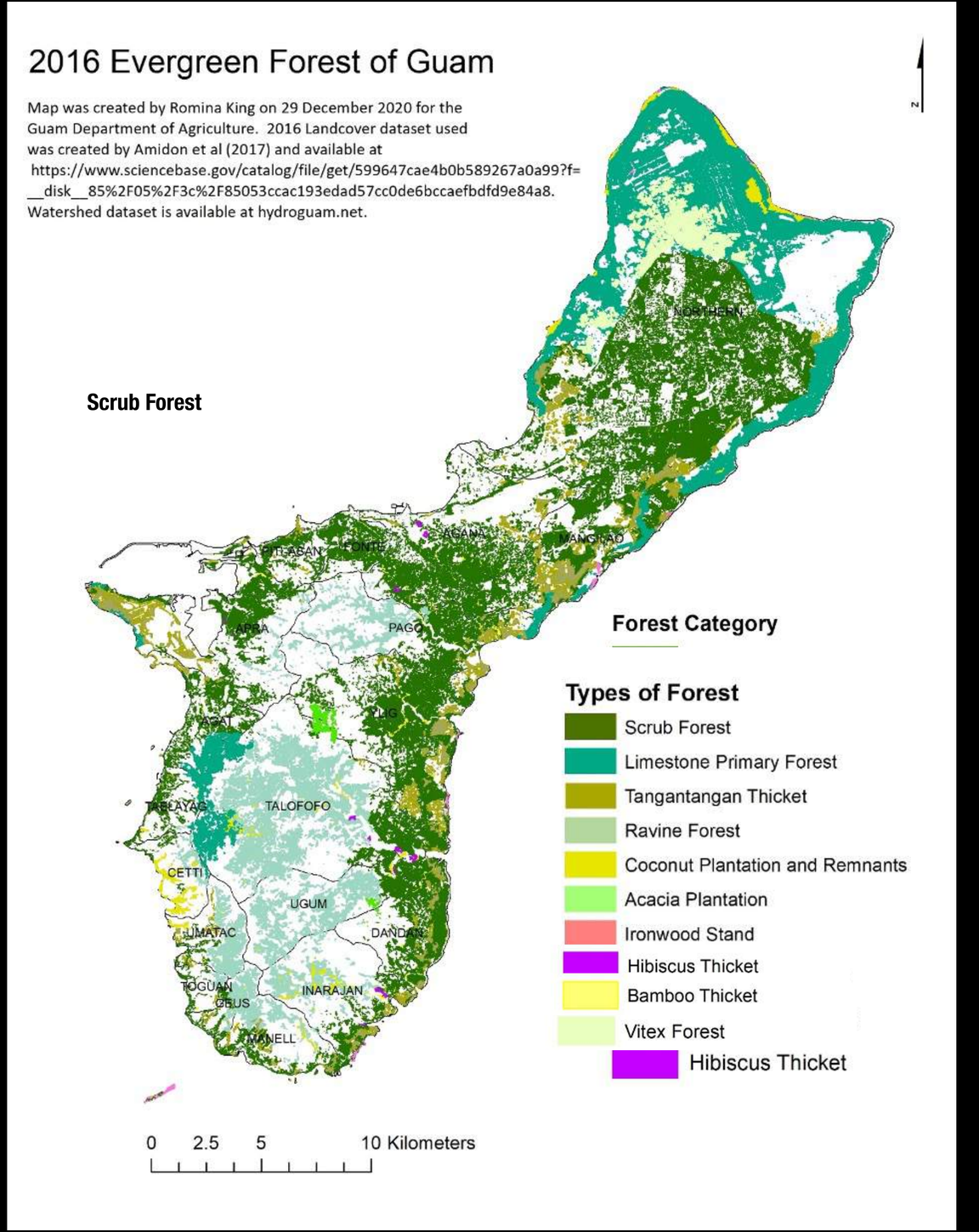
How have forests changed over time?

Table 6. General comparison of 2016 and 2014 areas of the subcategories of 'evergreen' forest on Guam.

Amidon et al. 2016				Guam PIVM -2014			Change (%)
Forest Type	Area (sq km)	Percentage (%)	Percentage (%)	Forest Type	Area (sq km)	Percentage (%)	
Mixed Introduced Forest (Scrub)	115.32	48.04	52.5	Scrub	118.05	47.9	4.6
Vitex Forest	9.07	3.78					
Bamboo Thicket	1.19	0.49					
Hibiscus Thicket	0.46	0.19					
Native Limestone Forest	52.52	21.88	21.88	Limestone Primary	64.81	26.3	-4.42
Native Volcanic Forest	34.71	14.46	14.46	Ravine	38.37	15.57	-1.11
Leucaena Thicket	19.89	8.28	8.28	Tangantangan	20.38	8.27	0.01
Coconut Forest	5.44	2.27	2.27	Coconut Plantation & Remnants	3.37	1.37	0.9
Acacia Forest	0.88	0.37	0.37	Acacia Plantation	0.87	0.35	0.02
Casuarina Forest	0.59	0.25	0.25	Ironwood Stand	0.6	0.24	0.01
Total	240.06				246.45		



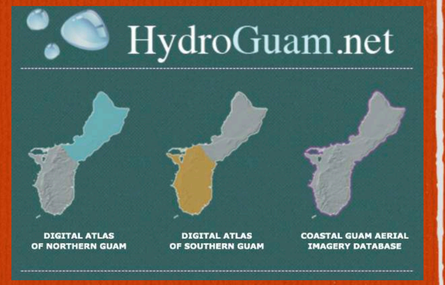
How have forests changed over time?



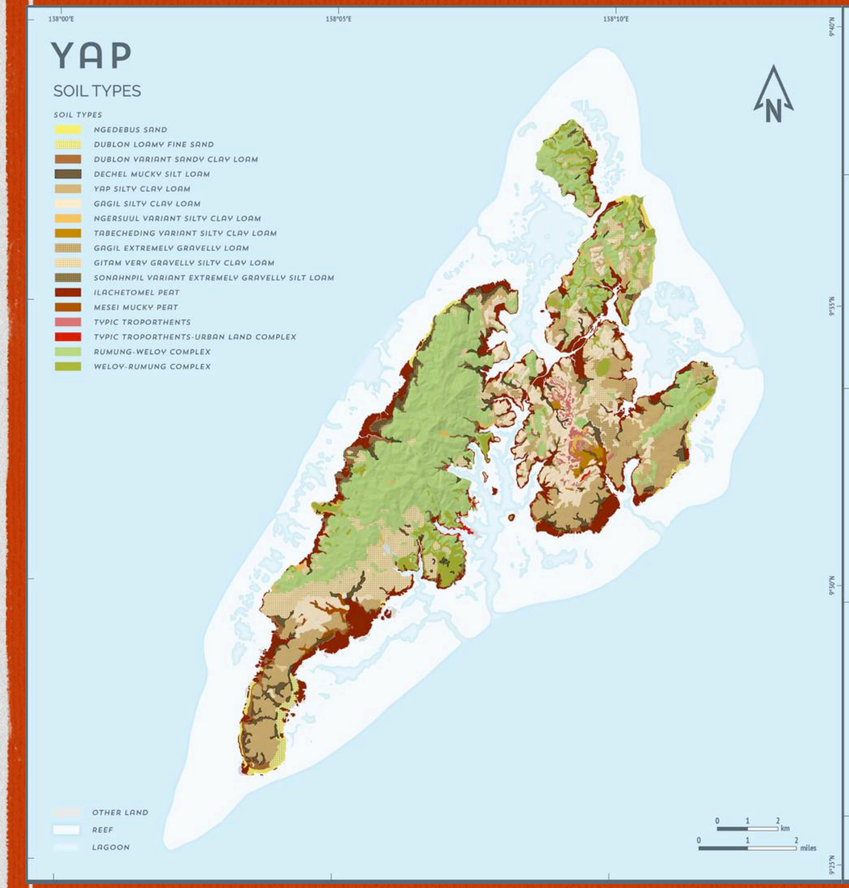
Where can I download cool maps of Guam?

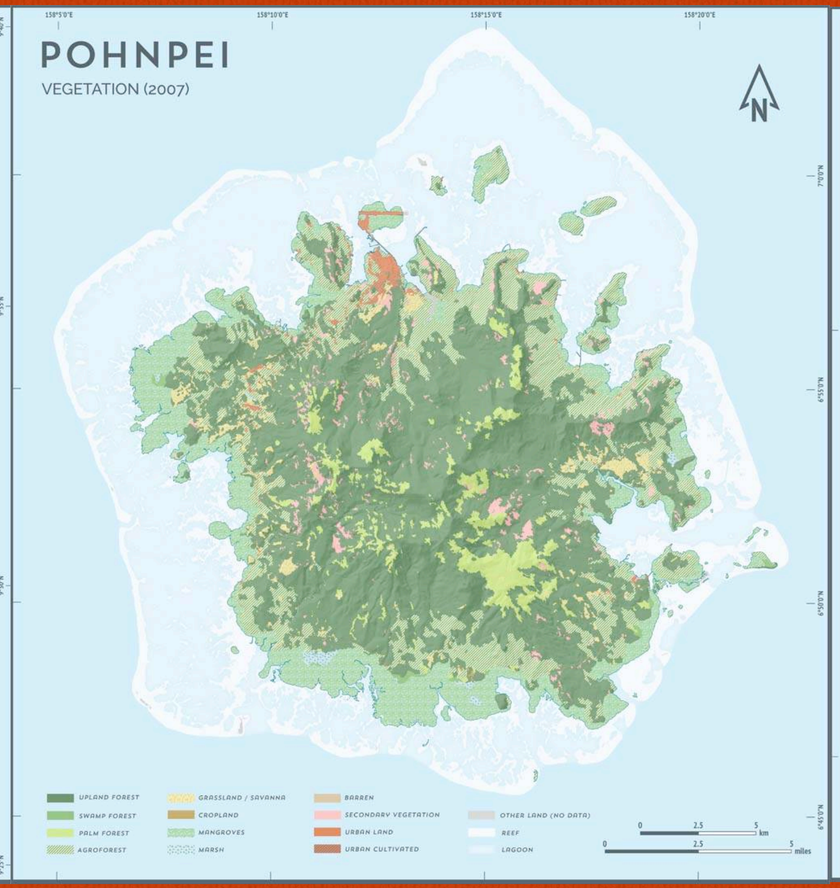
www.hydroguam.net

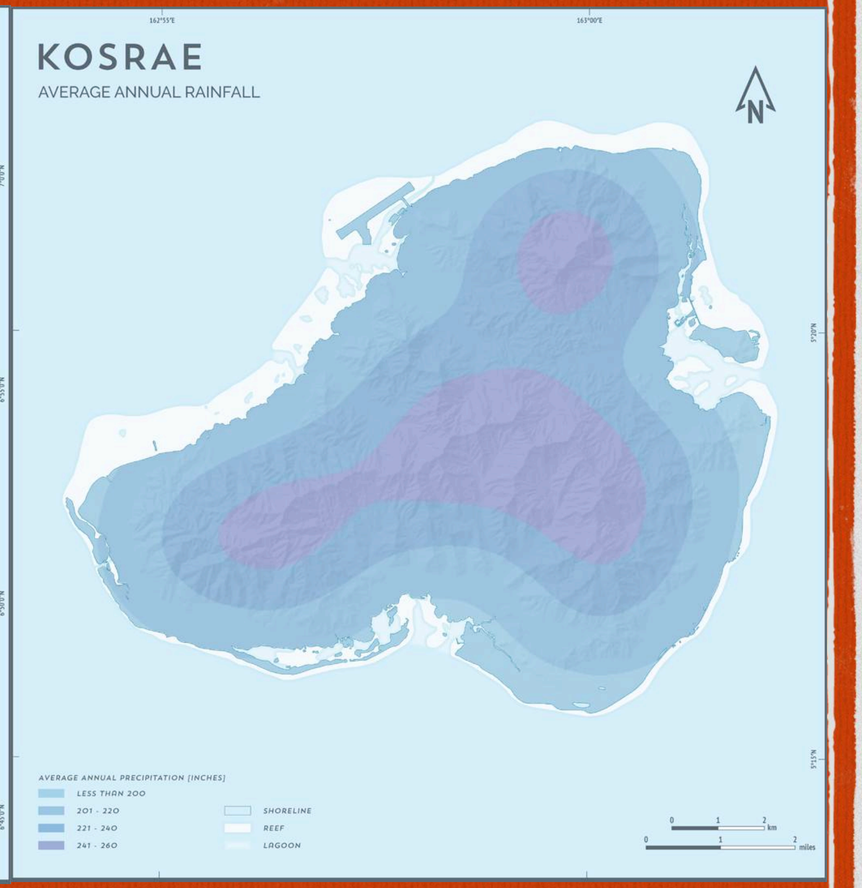
One-stop shop to for local maps and geographic information about Guam



Where can I download cool maps of other islands in Micronesia?

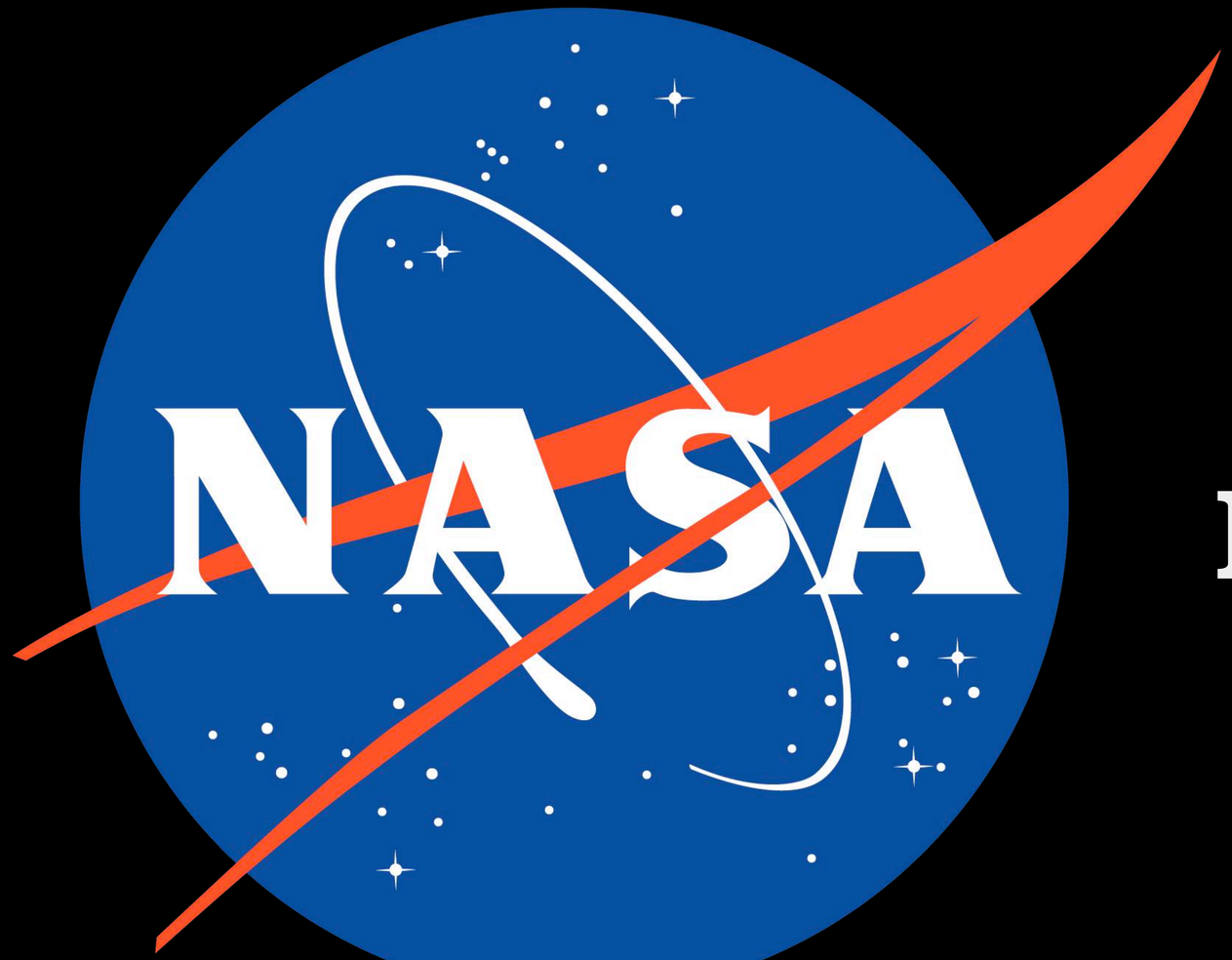




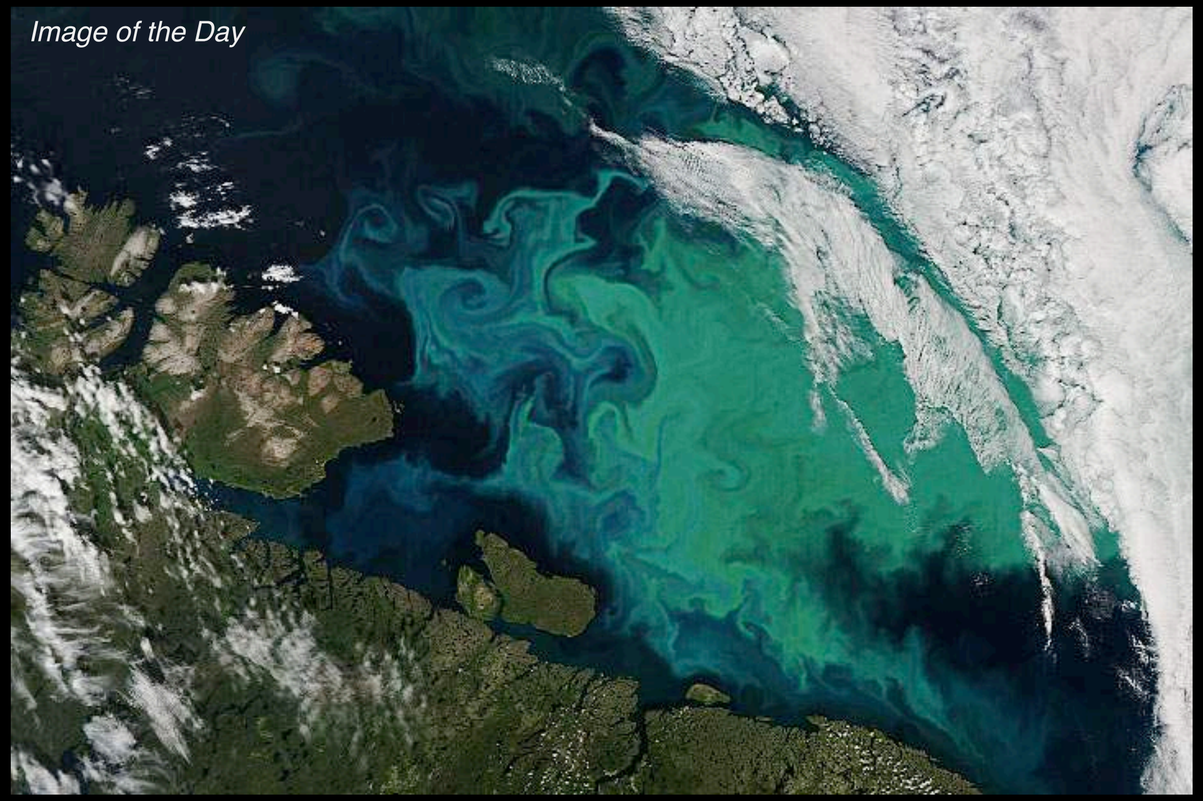


https://islandatlas.org/

One stop shop for maps of the Federated States of Micronesia



Resources for Educators



Keeping a Close Eye on the Storm: Hurricanes

Learn all about how satellites track storms – from formation, landfall, and the aftermath

Barrier Islands: Sands & Lands in Motion

Explore the shore with EO Kids' Barrier Islands: Sands & Lands in Motion. Learn about Earth's changing shorelines, especially barrier islands.

Shifting Shapes of Sandy Scapes

Building sand castles is a summer pastime, whether in a sandbox or at the beach. Nature builds with sand, too, using wind to create different shapes.

The Ozone Hole: We Need More Sunscreen

EO Kids is discovering more about Earth's ozone layer and about what happens when it gets damaged. Plus, create your own ozone hole map in our "Data Viz" activity: "Mapping Ozone."

Making and Melting Ice at Earth's Poles

Find out about sea ice and its effects on ecosystems and global climate by looking at how and when it forms on Earth. Plus, learn how different types of water freeze in our "DIY Science" activity: "Saltwater is Cool (Literally)."

Peeking at Penguins: Poop from Space

Did you know that satellites can be used to find penguin populations by looking at what they leave behind? EO Kids is discovering more about penguins by looking at their poop from space.

Night Vision: Learning from City Lights

All those sparkly lights reveal a lot about where and how people live on Earth – everything from population, to disaster recovery, to where people are celebrating.

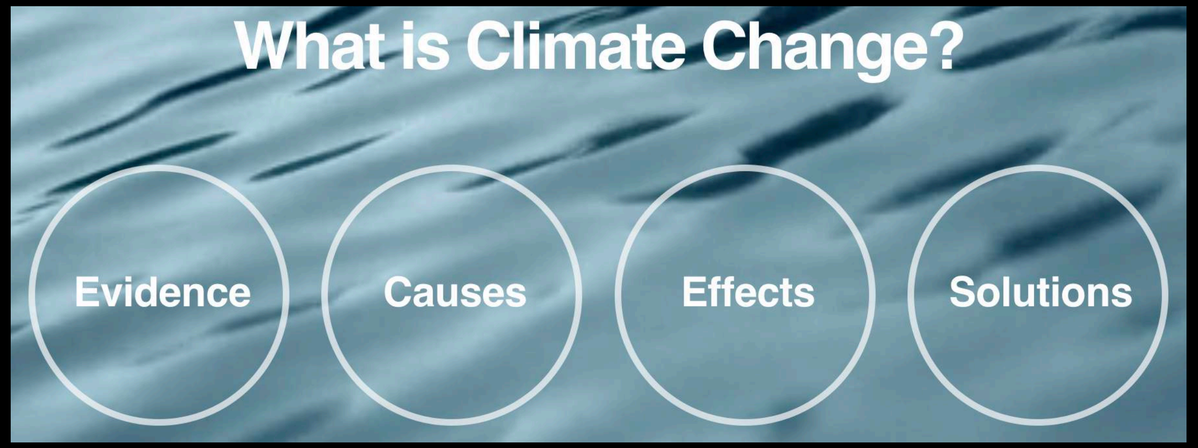
The Shape of Farming: Water For Crops

Farmers use a number of different methods to irrigate crops, and some of them result in pretty interesting shapes.

earth Observatory

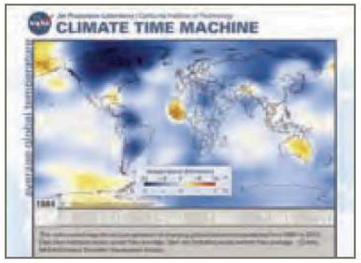
https://earthobservatory.nasa.gov/

EO Kids is written for audiences aged 9 to 14. It is published with support from NASA's Landsat, Terra, and Aqua missions.

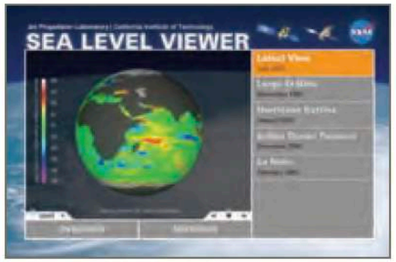


NASA Global Climate Change

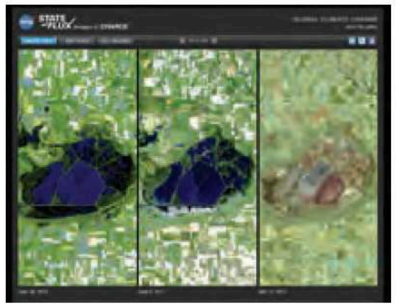
https://climate.nasa.gov/



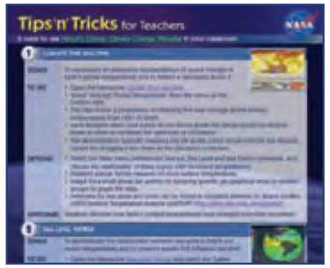
Climate Time Machine • *http://climate.nasa.gov/interactives/climate_time_machine* • This series of visualizations show how some of the key indicators of climate change, such as temperature, sea ice extent and carbon dioxide concentrations, have changed in Earth's recent history.



Sea Level Viewer • *http://climate.nasa.gov/interactives/sea_level_viewer* • Explore the latest global sea level from space, as well as sea level changes during El Niño and La Niña years, Hurricane Katrina, and the 2004 Indian Ocean tsunami.



State of Flux • *http://climate.nasa.gov/state_of_flux* • Every week, this gallery features sets of images of different locations on the planet that show change over time, with periods ranging from centuries to days. The images showcase the effects of climate change, human impact, natural hazards, and more.

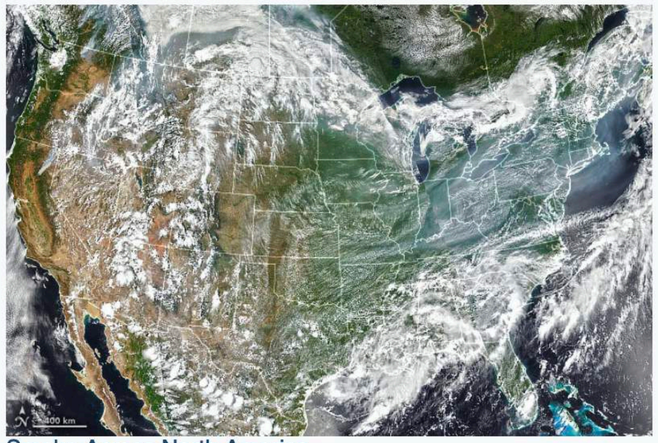


Tips and Tricks for Teachers • *http://climate.nasa.gov/education/tips* • Download this 3-page, interactive document for step-by-step instructions on six ways to use NASA's Global Climate Change website in your classroom, aligned with National Science Education Content Standards.

CARBON DIOXIDE	GLOBAL TEMPERATURE	ARCTIC ICE MINIMUM	ICE SHEETS	SEA LEVEL	OCEAN HEAT ADDED
↑ 417 parts per million	↑ 2.1 °F since 1880	↓ 13.1 percent per decade	↓ 428 billion metric tons per year	↑ 3.4 millimeters per year	↑ 326 zettajoules since 1955

Ocean Color Web

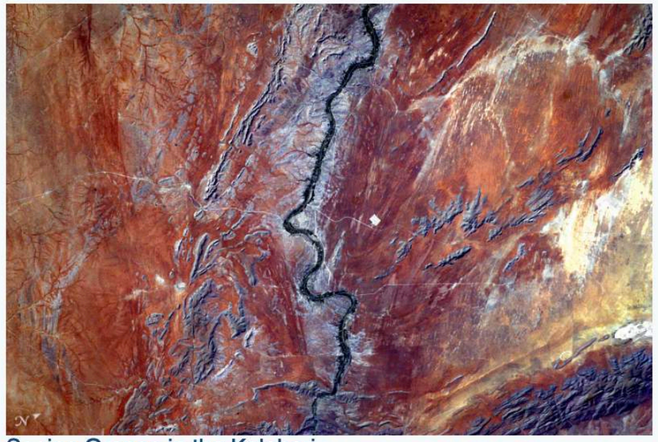
https://oceancolor.gsfc.nasa.gov/



Smoke Across North America

Deadly Floods Surprise Europe

Oregon Smothered with Smoke



Seeing Orange in the Kalahari

An Abundance of Aquaculture in Andhra Pradesh

Sweden's Siljan Ring

Visible Earth

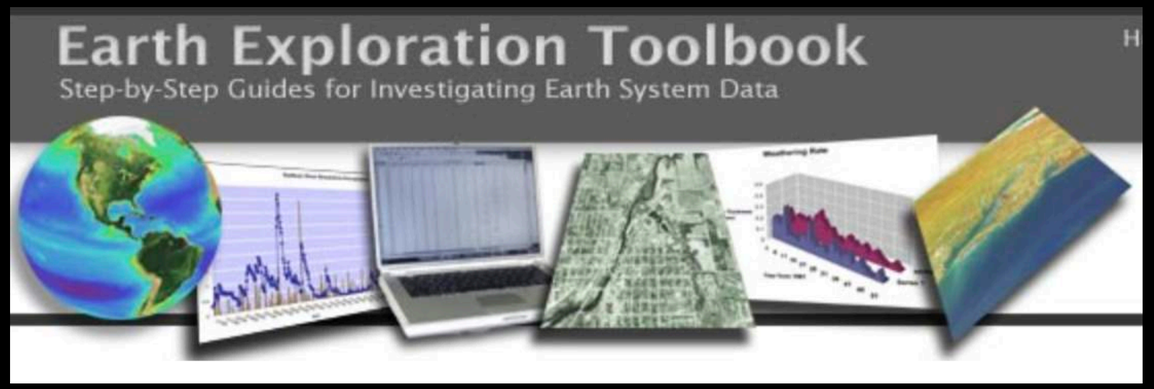
https://visibleearth.nasa.gov/

Earth System Topics

Atmosphere 12 matches
Biosphere 6 matches
Climate 15 matches
Earth's Cycles 5 matches
Geography 2 matches
Human Dimensions 15 matches
Hydrology 6 matches
Oceans 8 matches
Solar System and Astronomy 1 match
Solid Earth 9 matches
Surface Processes 9 matches
Time/Earth History 2 matches

Tools

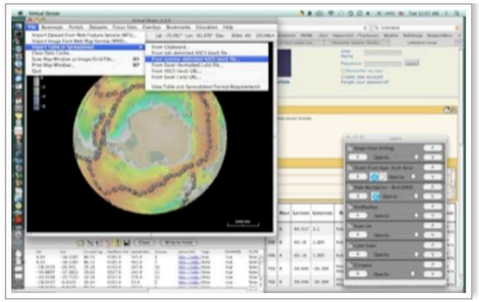
Data Portals 7 matches
Desktop Mapping/GIS 16 matches
Image Analysis 13 matches
Modeled Data 2 matches
Online Graphing 4 matches
Online Mapping/GIS 7 matches
Spreadsheets 15 matches



Description

This chapter focuses on reconstructing the Paleocene-Eocene Thermal Maximum (PETM), which occurred between 50 to 60 million years ago. The PETM provides scientists with a glimpse of the effect of a relatively abrupt—*geologically speaking*—global warming. Data about this event, obtained from oceanic sediment cores, is particularly clear and useful in determining climate history.

In this chapter, you will access Integrated Ocean Drilling Program (IODP) core data with Virtual Ocean software. First, you will identify appropriate bathymetric depths for finding desired marine sediments. Then, you will locate potential core, log, and seismic data to map the marine sediment biostratigraphy. Last, you will download and examine ocean floor core data from the CHRONOS data portal to search for a specific planktonic foraminifera, *Acarinina praepentacamerata*, that prefers near-surface (warmer) ocean conditions.



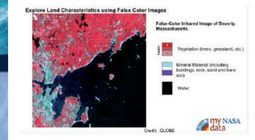
Screen capture of Virtual Ocean software. Click image for a larger view.

Earth Exploration Toolbook (EET)

https://serc.carleton.edu/eet/index.html

My NASA data

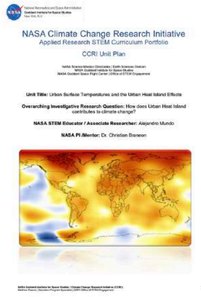
https://mynasadata.larc.nasa.gov/



Exploring Satellite Imagery and False Color Images

Grade Level: 6-8 , 9-12

This lesson walks students through the use of false-color imagery from Landsat and the identification of different land cover features using these as models. Building from an original GLOBE lesson, this resource features Google Slide and Jamboard to assist in both face-to-face and virtual learni



Unit: Urban Surface Temperatures and the Urban Heat Island Effects

Grade Level: 9-12

This unit plan is published by the NASA Climate Change Research Initiative's (CCRI) Applied Research STEM Curriculum Portfolio. The CCRI Unit Plan, called “Urban Surface Temperatures and the Urban Heat Island Effects,“ has the purpose to educate students how climate is changing in urban settings

Questions?

Si Yu'os Ma'åse

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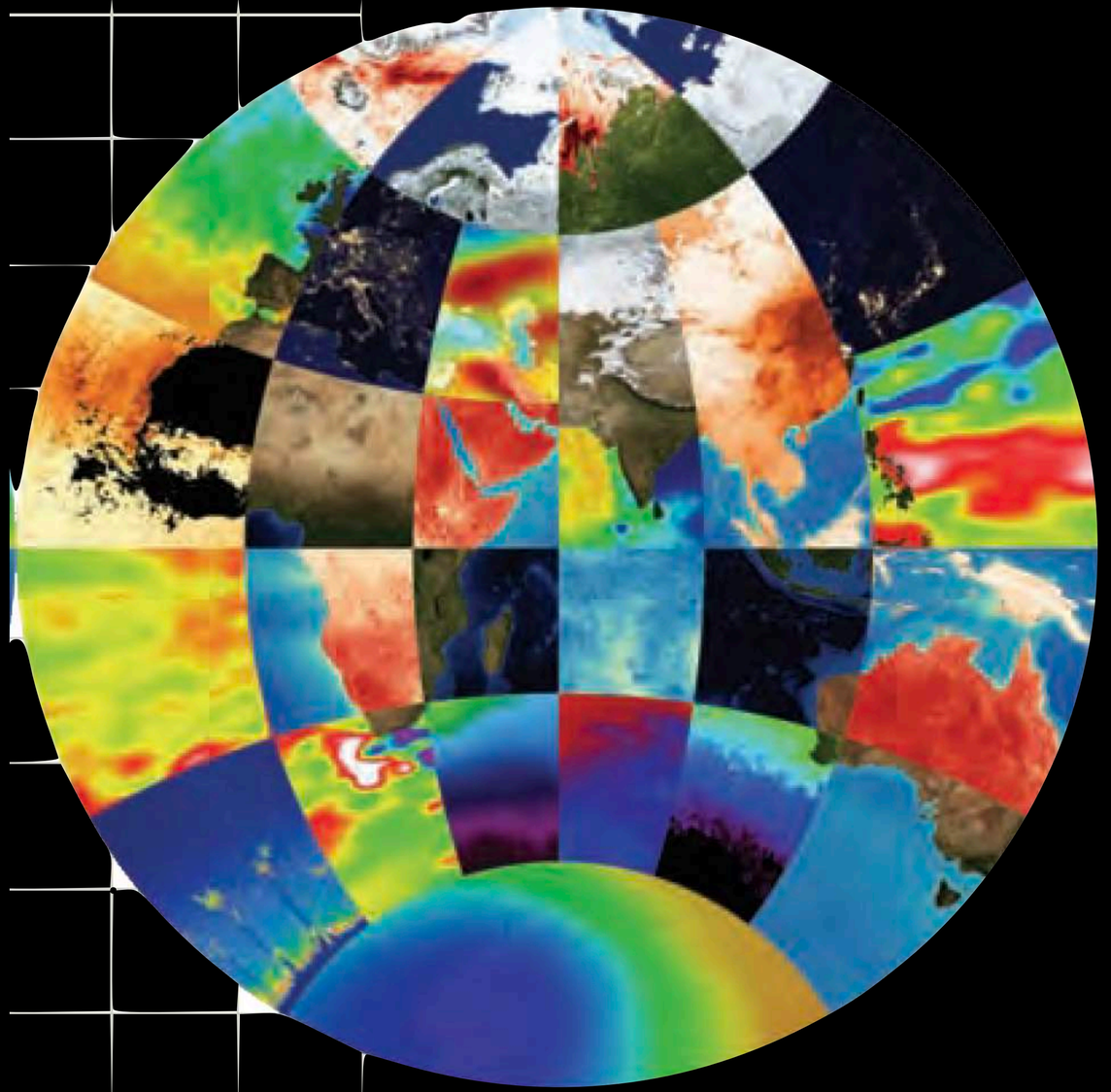

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