RIVER CANE RESTORATION

Weaving Satellite Data into a Rivercane Map

BACKGROUND ON RIVER CANE

"Development and agriculture has severely impacted native river cane (Arundinaria gigantea) habitat. The Eastern Band of Cherokee Indians (EBCI), who use river cane for native crafts, are now concerned about the future of the species. "

blowguns, fishing poles, chairs, baskets, pipestems and for shining clay pots.

"According to historical studies conducted by Noss et al. (2001), canebrakes are endangered and less than 2% of the original distribution remains. "

"Canebrakes provide habitats for a variety of wildlife including species of birds, mammals and reptiles (Platt et al., 2001). Dense stands of cane can act as buffers, filtering and removing contaminants, nutrients and sediments (Schoonover et al., 2006)."

Sources: https://www.wcu.edu/WebFiles/PDFs/Katie_Thesis.pdf, http://sensiblesurvival.blogspot.com/2011/05/make-river-cane-blowgun.html
http://www.cherokee.org/About-The-Nation/Culture/General/Uses-of-River-Cane & https://youtu.be/il4DGoNlUT0

OBJECTIVE – IDENTIFY AREA ON A MAP WHERE NATIVE RIVER CANE CAN GROW

Rivercane Needs:

energy (sunlight) for photosynthesis,

respiration (soil nutrients)

and

transpiration (water)

Image Source: http://www.smliv.com/features/river-cane-of-the-southern-appalachians/

QUESTION: WHERE CAN RIVER CANE BE RE-ESTABLISHED?

Variables to Consider:

- Elevation – prefers areas below 760-m in elevation (2,493.4 ft.) – GSMNP map

- Close to Water – prefers floodplains - GSMNP map

- Flooding tolerance – it is unable to withstand long periods of being under water - GIOVANNI

- Solar Energy – prefers thin or no canopy cover - GIOVANNI

- Soil Type – prefers soils with high sand content - GSMNP map

near infrared visible — 50% — 8%

near infrared visible — 40% — 30%

Healthy Vegetation absorbs visible light
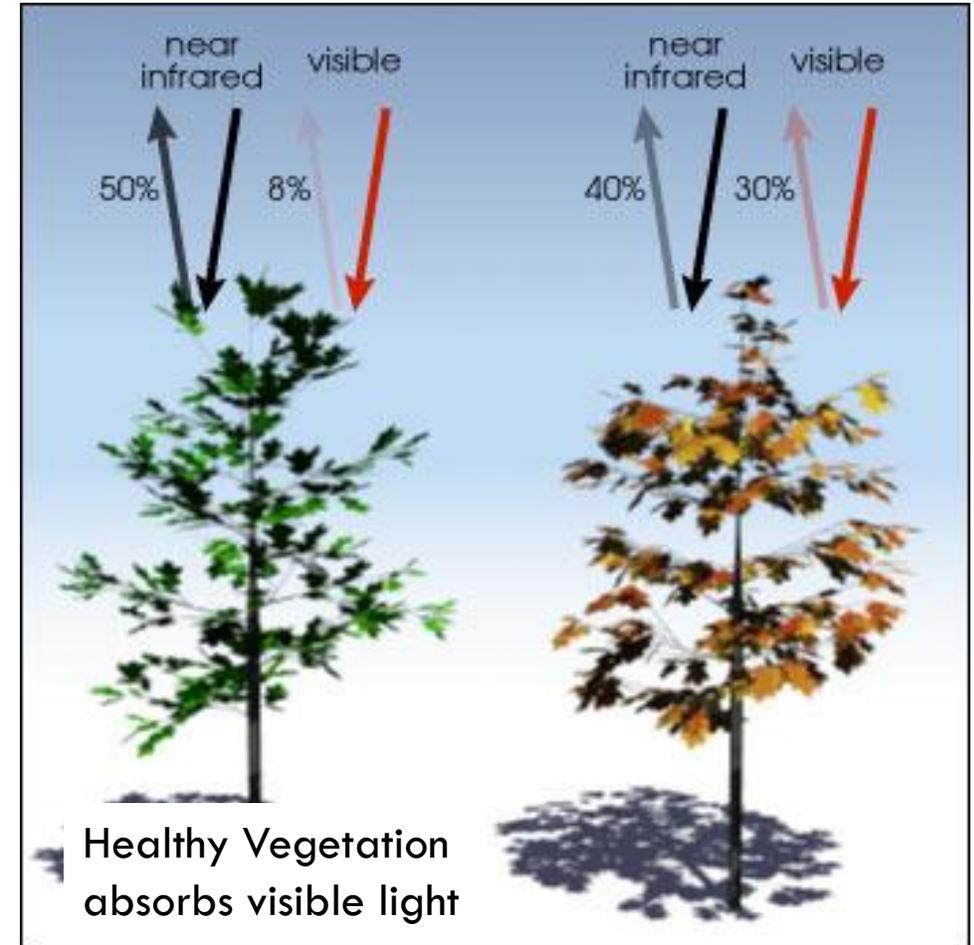
Index values show the ratio of absorbed light

$$\frac{(0.50 - 0.08)}{(0.50 + 0.08)} = 0.72$$

$$\frac{(0.4 - 0.30)}{(0.4 + 0.30)} = 0.14$$

Image Source: https://www.laserfocusworld.com/articles/print/volume-50/issue-04/features/photonics-applied-terrestrial-imaging-spectral-imaging-satellites-monitor-global-vegetation-health.html

GSMNP ONLINE MAP – START HERE

Soils & Elevation – already mapped

Your task – Identify three areas of interest and record the latitude & longitude of each

Use this LINK

Layers – use to turn on or off soil, parent material & elevation
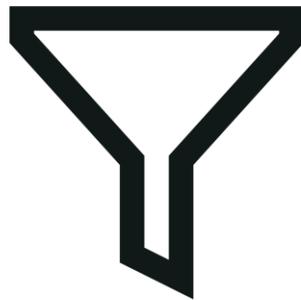
Filter – show ONLY soil & parent material

Draw – put circles around the three areas you choose to investigate

NEXT STEP – REMAINING VARIABLES

1. Open the mapping program found here: https://giovanni.gsfc.nasa.gov/giovanni/

2. Select Plot type – this depends on the type of data available.

ANALYSIS OF RIVER CANE HABITAT

Select Date Range (UTC)

YYYY-MM-DD

| 2009 - 12 - 01 | 00 hrs ▼ | to | 2009 - 12 - 31 | 23 hrs ▼ |

Valid Range: 1979-01-01 to 2014-11-28

Pick an end date ✕

2009 ▼   12 - Dec ▼

Su	Mo	Tu	We	Th	Fr	Sa
29	30	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2
3	4	5	6	7	8	9

Select Variables

▼ **Disciplines**
- ☐ Aerosols (118)
- ☐ Atmospheric Chemistry (12)
- ☐ Atmospheric Dynamics (62)
- ☐ Hydrology (16)
- ☐ Water and Energy Cycle (26)

▼ **Measurements**
- ☐ Aerosol Index (1)
- ☐ Air Pressure (4)

3. Select Data range – analyze one year or many years

4. Select our Region by drawing a box on a world map & zooming in

Select Region (Bounding Box or Shape)

Format: West, South, East, North

| 23 : 59 | -130.0781,4.9219,-78.0469,60.4688 |

Select a Shape...

Greenland   Russia

Canada
United States   China
India
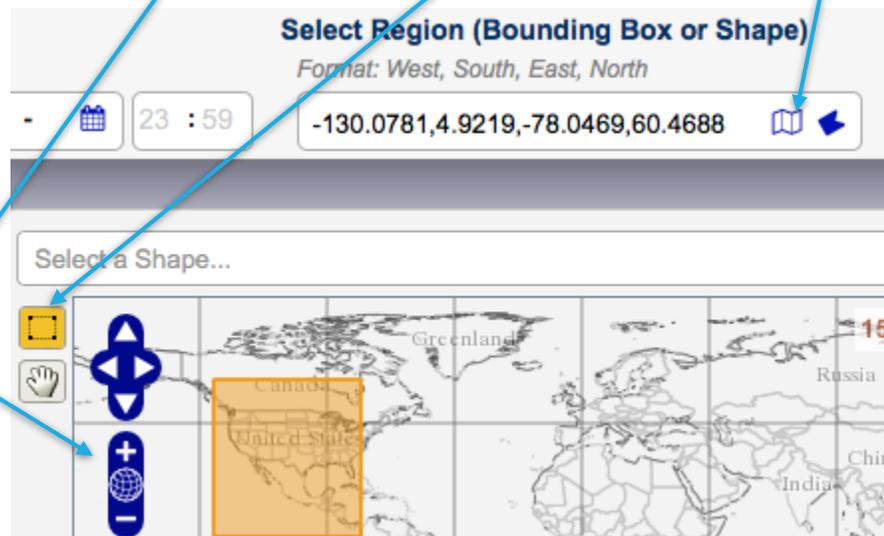
Coordinates:
West = -83.940
South = 35.428
East = -83.001
North = 35.795
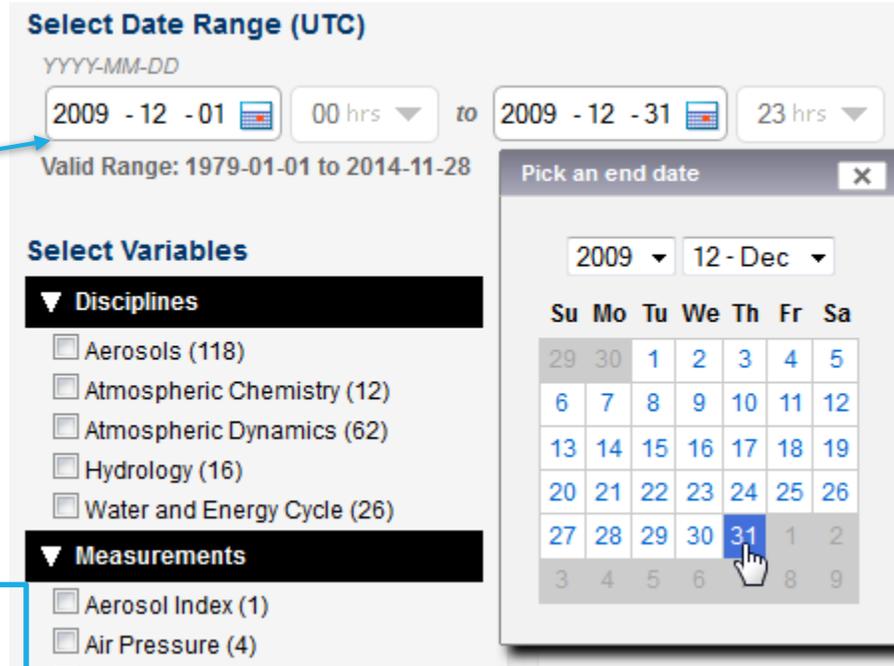
Dates:
Jan. 1 2010
Dec. 31 2015

USING GIOVANNI

Select Variables – work in pairs – each with a different variable

- floodplains – Discipline = Hydrology, Measurement = Flooding, Choose Flooded Area
- thin or no canopy cover – Measurements = Vegetation, Choose first option
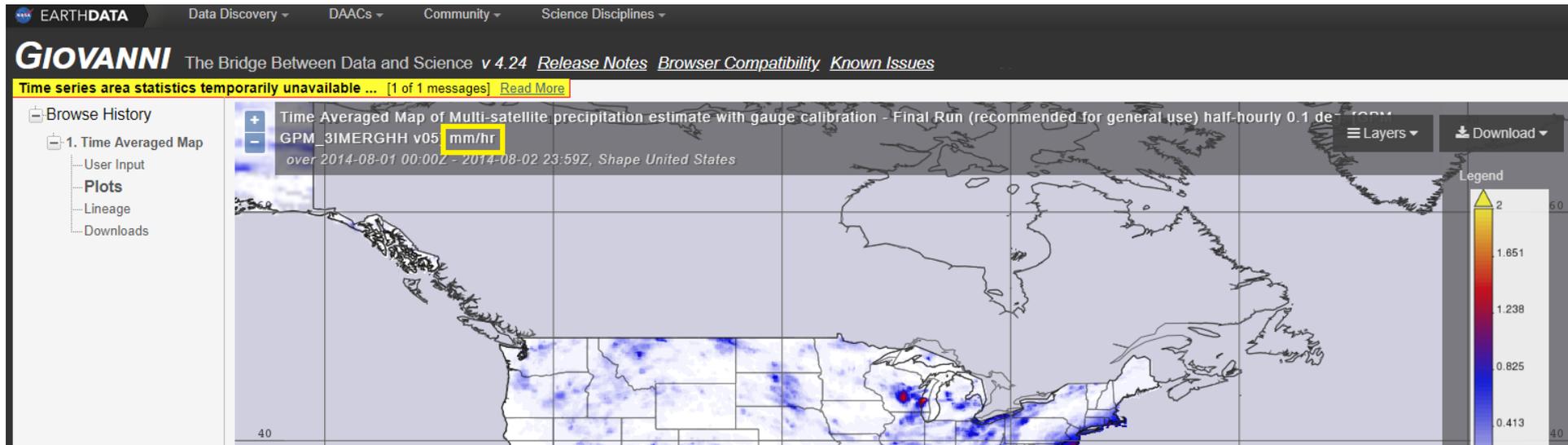
Giovanni will keep track of the maps you generate

Use the Browse History menu on the left to see each map you make

Click User Input under Browse History to change map & maintain a record of maps you've made

FLOODING & CANOPY COVER PARAMETERS

Flooded Area

This ranges from 62,813 m^2 (15 acres) to

1,931,582 m^2 (477 acres)

Look for Over 100 on scale

Vegetation

This ranges from 64% to 68%

Look for Below 6.5 on scale

FEEDBACK

GREAT SMOKY MOUNTAINS NATIONAL PARK

Tell us what you think!

Tell us about your experience today at this link:
https://goo.gl/forms/vA2yIRnNlW5aLGUh2