

# MUSA650 Spring 2020

## HW1 - Graphical Abstracts

### Homework 1: Storytelling using satellite imaging

Increasing availability of satellite imaging brings unique opportunities for journalism, as discussed in the articles below:

[Space, the Final Journalism Frontier](#)

[Satellite journalism - the big-picture](#)

In this homework, your task is to prepare a journalistic article about:

- a recent event (natural disaster, severe weather event, pollution, etc.), or
- the presentation of a specific geographic location (city, town, touristic destination, geographically interesting area, etc.)

using Sentinel Playground custom scripts for creating visualizations.

# Little Built at Touted Wisconsin Plant

Land has been cleared but few structures appear on satellite image



*The above map, magenta highlights the built environment and green highlights the natural environment, with green lawns standing out. Red is the barren soil of farms, which exhibits similar traits as buildings during the winter. With some visible construction at the plant, for the most part it is vacant. Scaled boxes show the size of the site imposed on Racine, illustrating its vast scale. Though much dirt has been moved, progress is slow.*

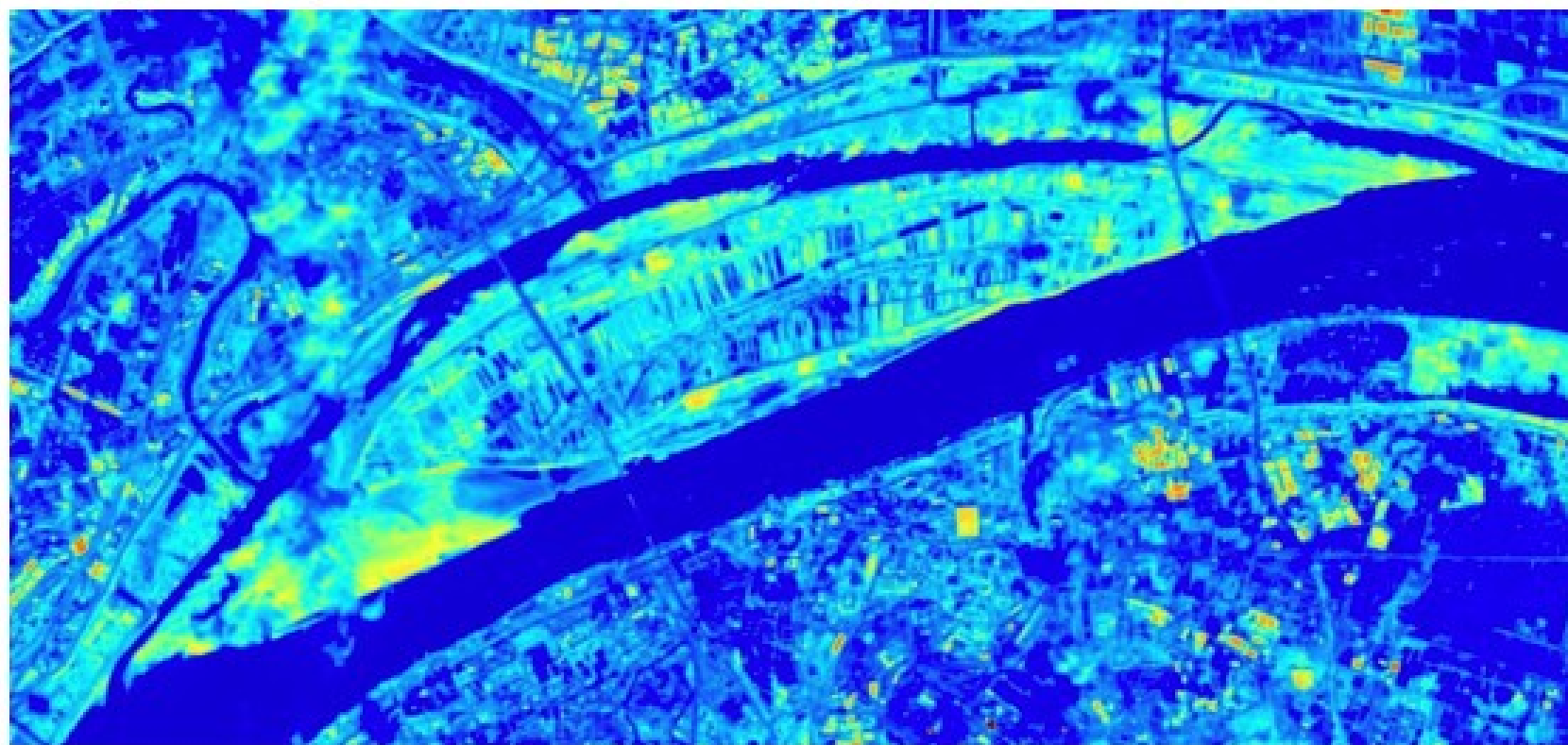


Figure 1. NDMI of Tianxingzhou Island on 2020-01-13



Visual 1: Satellite image of Taal Volcano before eruption based on bands 12, 11, and 4 (December 29, 2019)





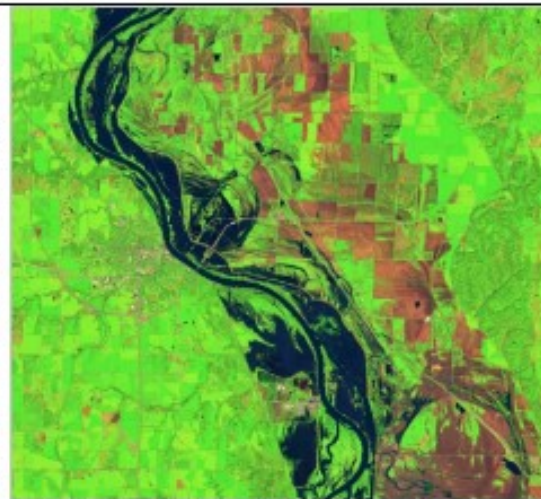
February 17, 2019 - Nebraska city



April 17, 2019 - Nebraska city



June 17, 2019 - Nebraska city



August 17, 2019 - Nebraska city



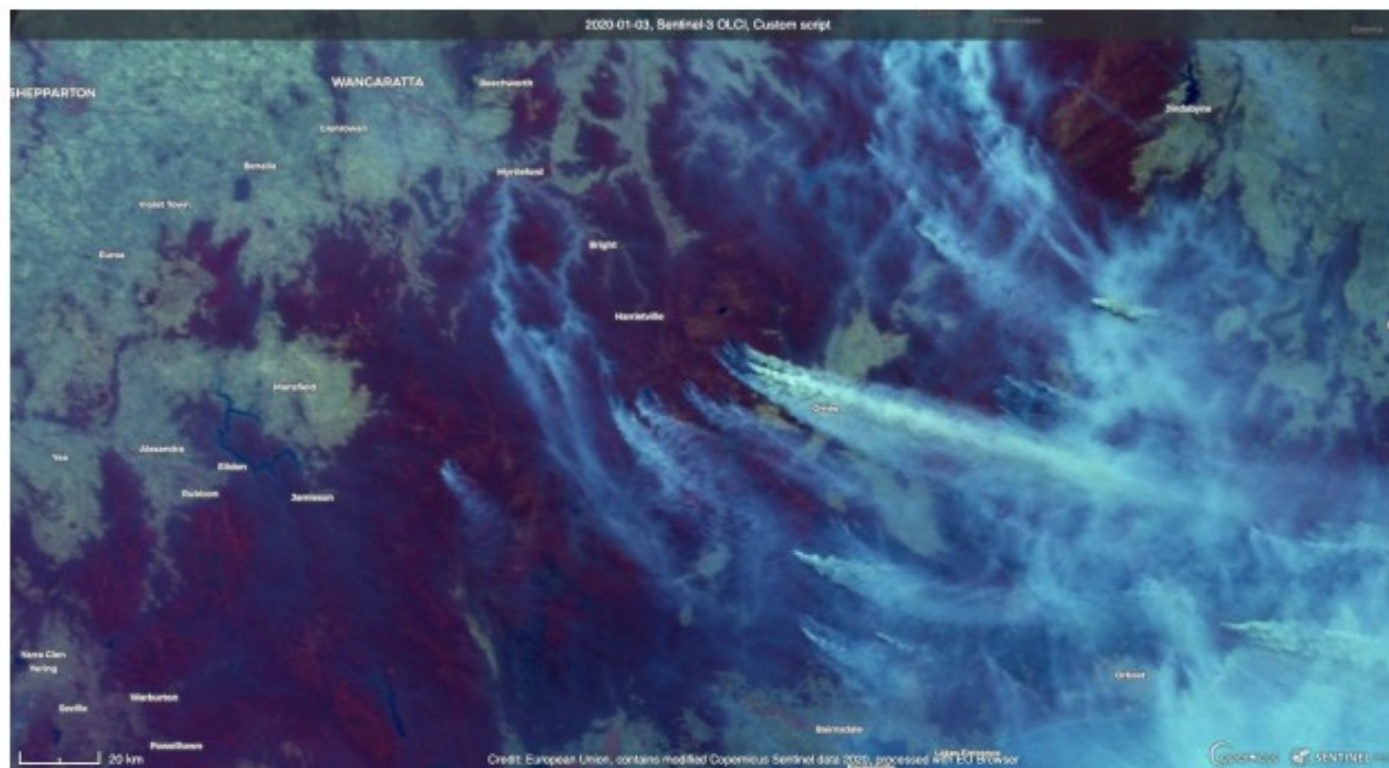


Fig 1 : Jan 3, Mount Imlay National Park, SENTINEL 3- OLCI



2019



2020

Limited and shrinking vegetation cover, resulting in increasing population density, may relate to the rapid transmission of Wuhan coronavirus.

Vegetation cover of Wuhan, Hubei, China. Sentinel Hub.



# The Rise of Xiong'an New Area

雄安新区发家史

Boundary

Rongcheng

Start-up Area

Anxin

Xiong



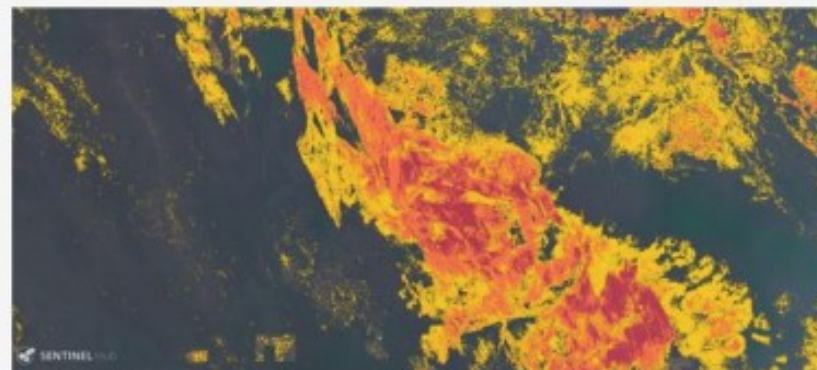
SENTINEL 1



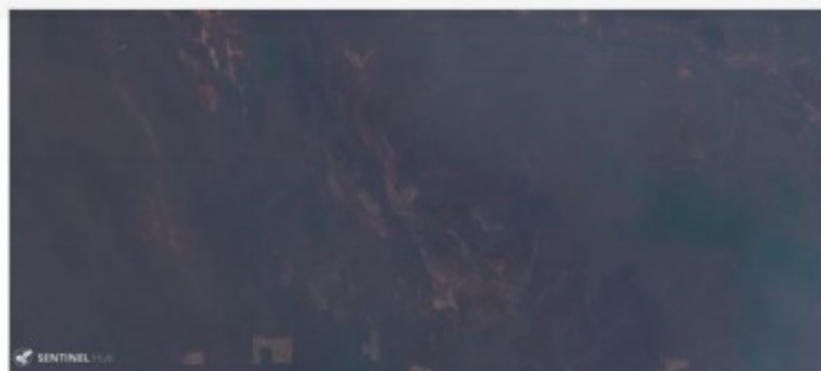
expanding in the central part



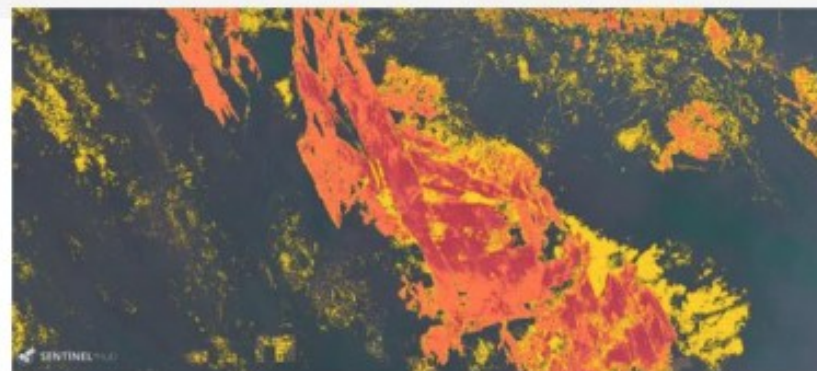
(a) Before 2019 Amazon rainforest wildfires, image taken on August 28, 2018.



(c) The difference Normalized Difference Vegetation Index of the two dates.



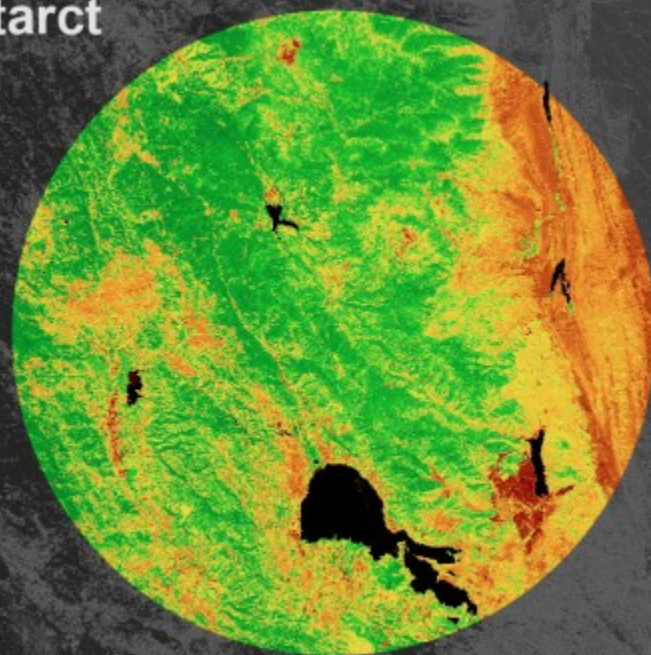
(b) After 2019 Amazon rainforest wildfires, image taken on September 17, 2019.



(d) The difference Normalized Burnt Ratio of the two dates.

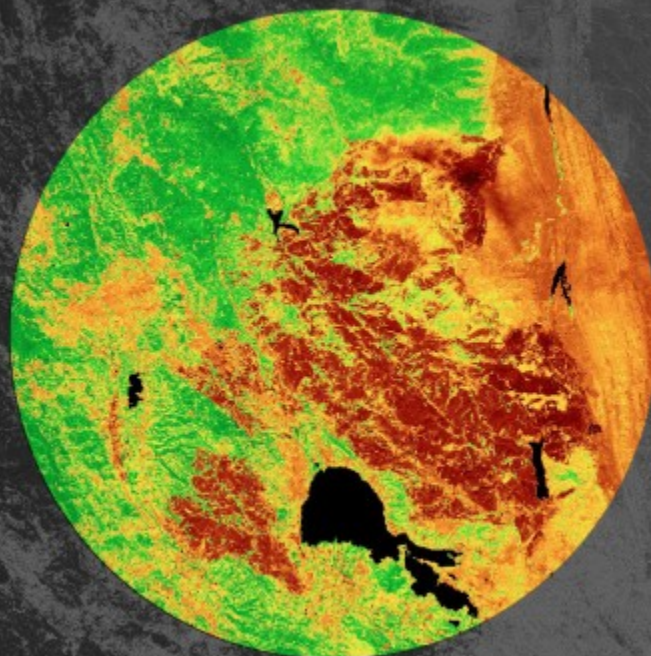
# Graphical Abstract

SENTINEL-2 2018-7-27 NDVI

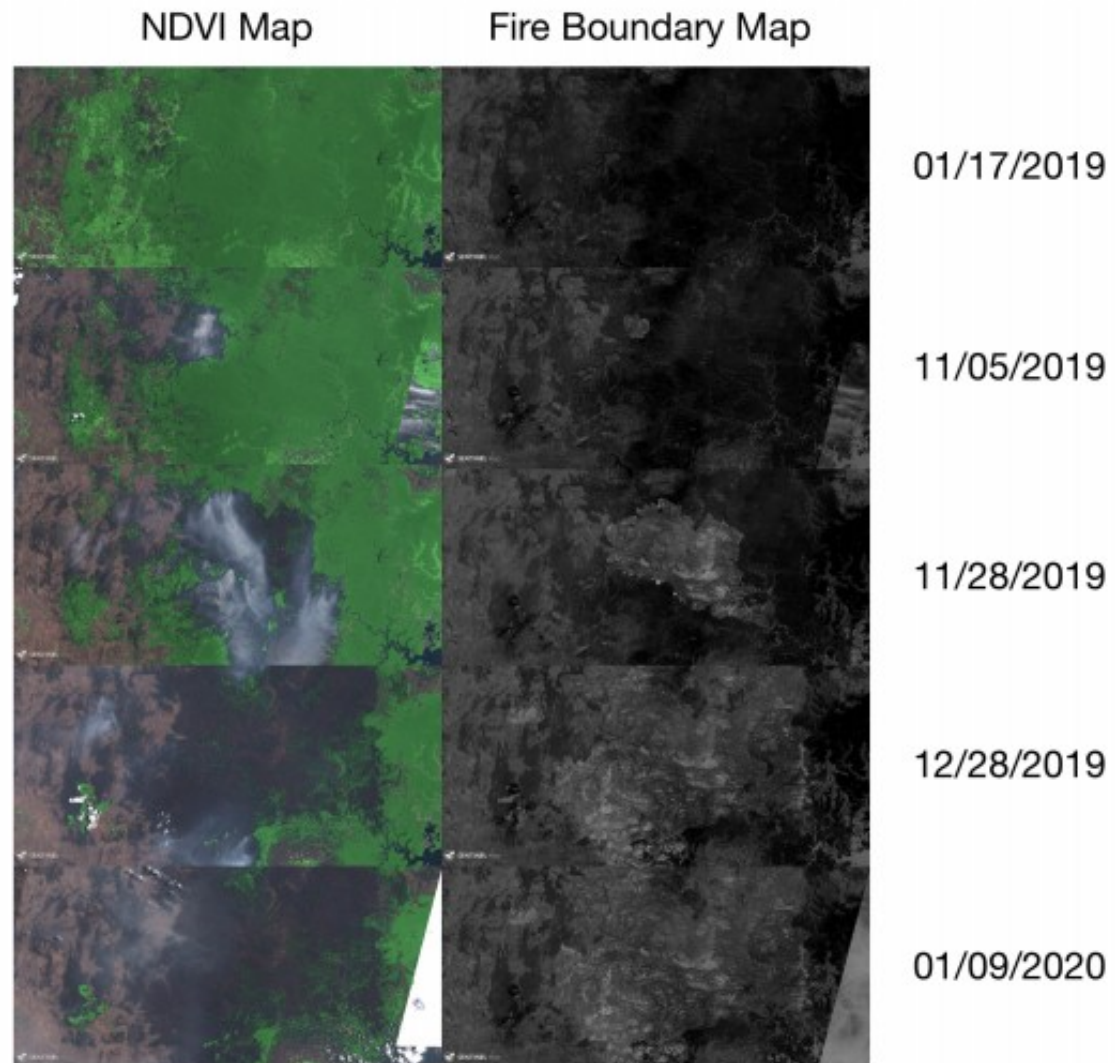


Cause: man trying to plug the entrance of a wasp nest with a stake

SENTINEL-2 2018-9-07 NDVI







**Figure 1.** graphical abstract. The wildfires boundary and the effects of fires on forests over the past few months.

**Midwest United  
States  
Experiences  
Record  
Flooding in 2019**

These satellite images further highlight the impact the 2019 flood in the Midwest United States had on agricultural land.

The top image shows a section of Pacific Junction,

Iowa, one of the areas impacted, in March 2018.

The bottom image shows this area in March 2019 after significant flooding.

The decrease in viable field land is striking. Flooding segments like these could be found all along the Missouri, Mississippi and Arkansas rivers.



*Pacific Junction, IA, March, 2018*



*Pacific Junction, IA, March, 2019*



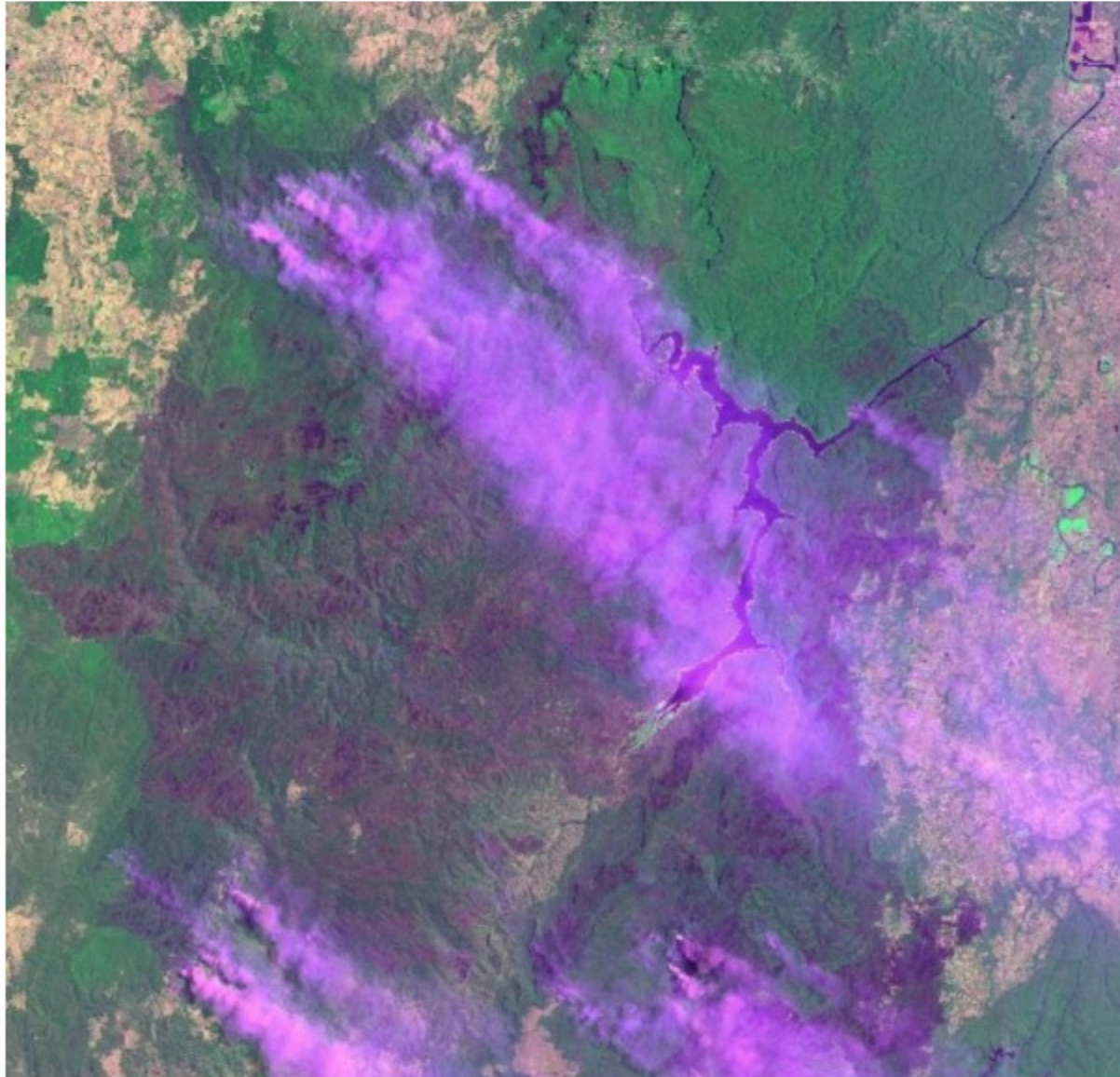
## Flood Monitoring for the Heavy Rain in western Japan



## Burned Vegetation and Build-up Lands in Australia's Wildfires

### Graphic Abstract

In January 20, 2020, large area of forest in Kanangra-Boyd National Park was destroyed by the long-term wildfires. The satellite image use purple color to indicate the comparsion between green vegetagion and bare land. The darkest purple color represents the most destroyed areas: there are almost nothing left besides scorched earth





# Wuhan: The City behind Coronavirus

- How remote sensing and satellite images visualize a city



Current deadly 2019 coronavirus epidemic draws the world's attention to **Wuhan**, the largest city in Central China.



Getting to know about Wuhan city via satellite images!



**Water area in Wuhan:**  
**BATHYMETRIC (B4, B3, B1) satellite image**  
- Highlight water condition and sediment



**Birdview of Wuhan and city form:**  
**TRUE COLOR (B4, B3, B2) and ATMOSPHERIC REMOVAL (B12, B8A, B3) satellite images.**  
- Present the cityscape



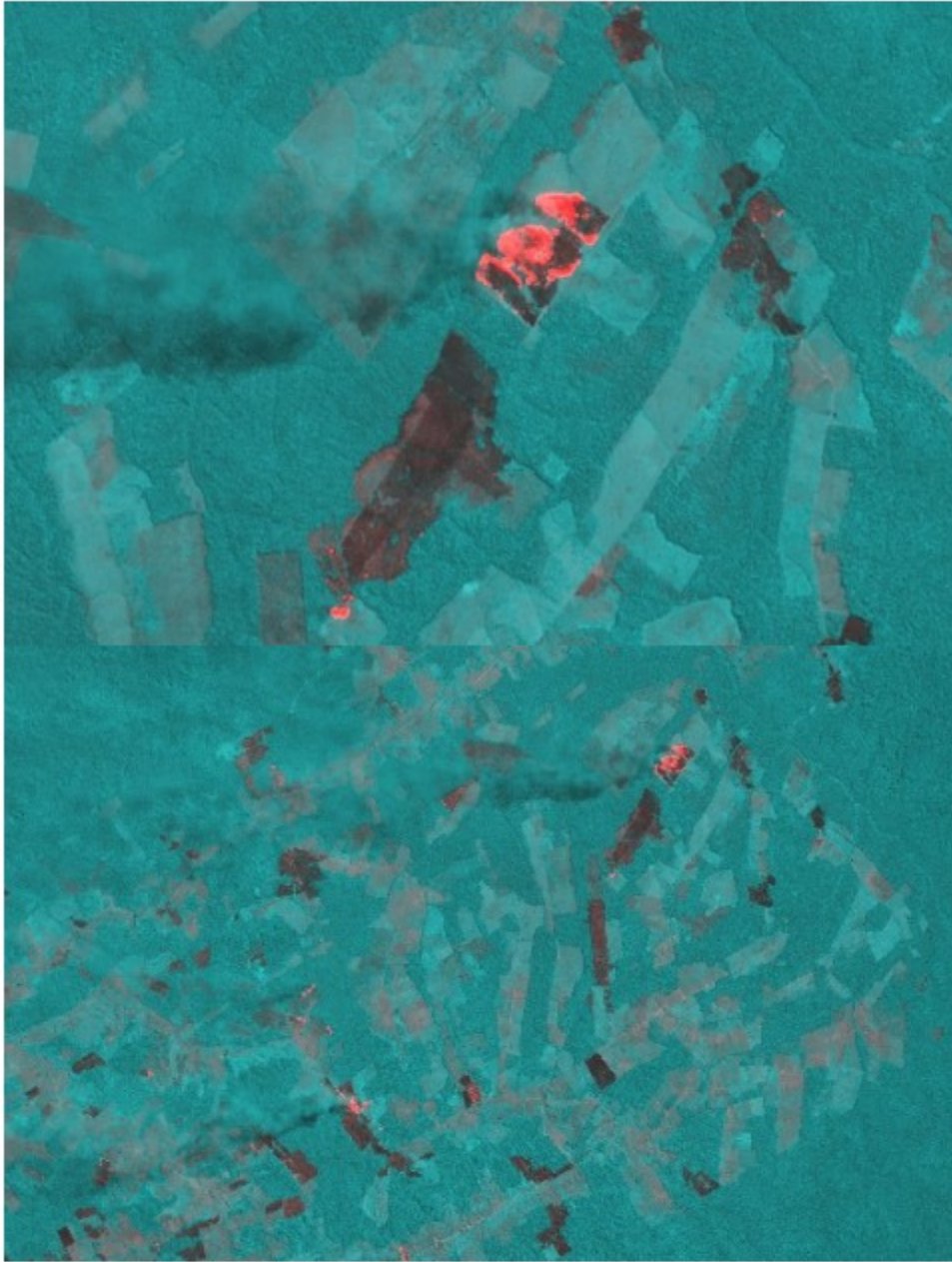
**Urbanization of Wuhan city:**  
**FALSE COLOR satellite image (B12, B11, B4)**  
- Highlight built-up areas



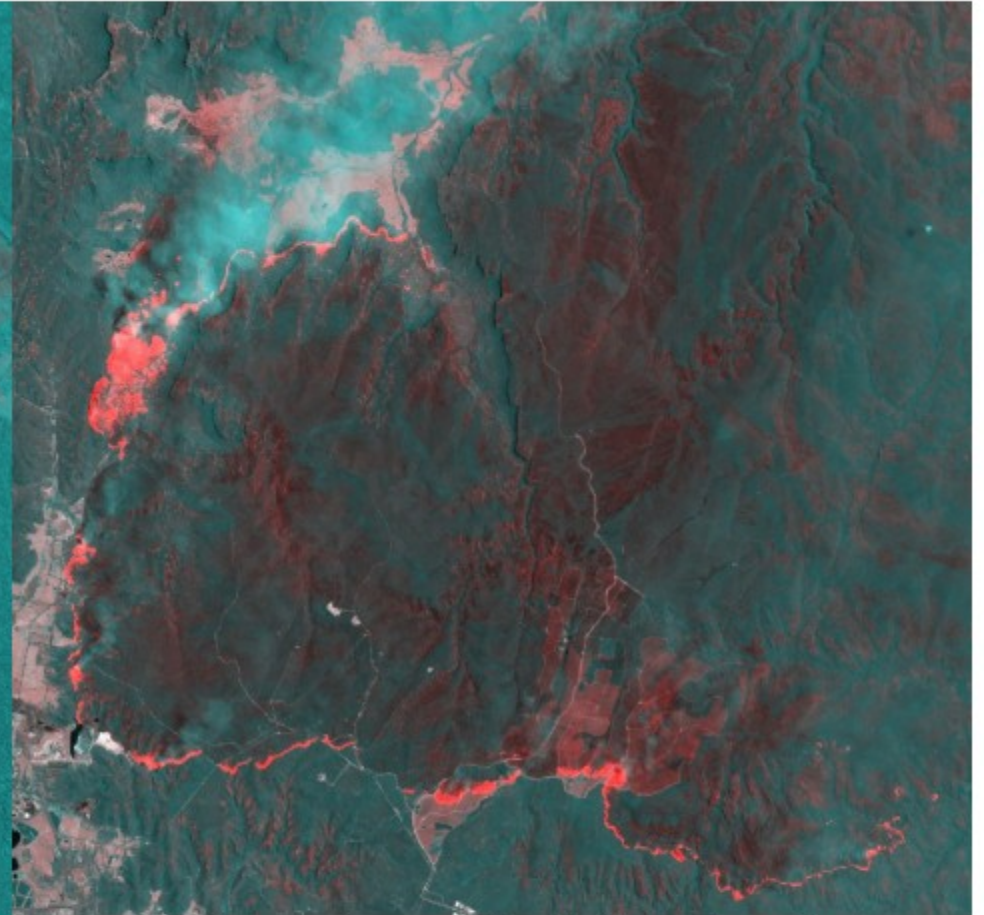
**Green area in Wuhan:**  
**COLOR INFRARED (B8, B4, B3) and NDVI satellite images.**  
- Highlight vegetation health and density



Fires near Apuí, Amazonas, Brazil



Fire near Sydney, New South Wales, Australia



Compared to the massive mega fires that have devastated southeast Australia, the controlled fires that loggers, farmers, ranchers, and miners have used to clear-cut the Brazilian Amazon have been much smaller and more contained. These images show how the potential damage caused by any one fire in the Amazon is much lower, but they also highlight how difficult these fires are to detect. They also accentuate the importance of enforcing restrictions on controlled fires in the rainforest. Under President Bolsonaro, Brazil has significantly loosened its protections for the Amazon, leading to a 30% increase in the rate of deforestation over the last year through thousands of small scale fires like the ones highlighted in the left set of images.



# Super Typhoon Hagibis Hit Japan Resulting in Severe Inundation

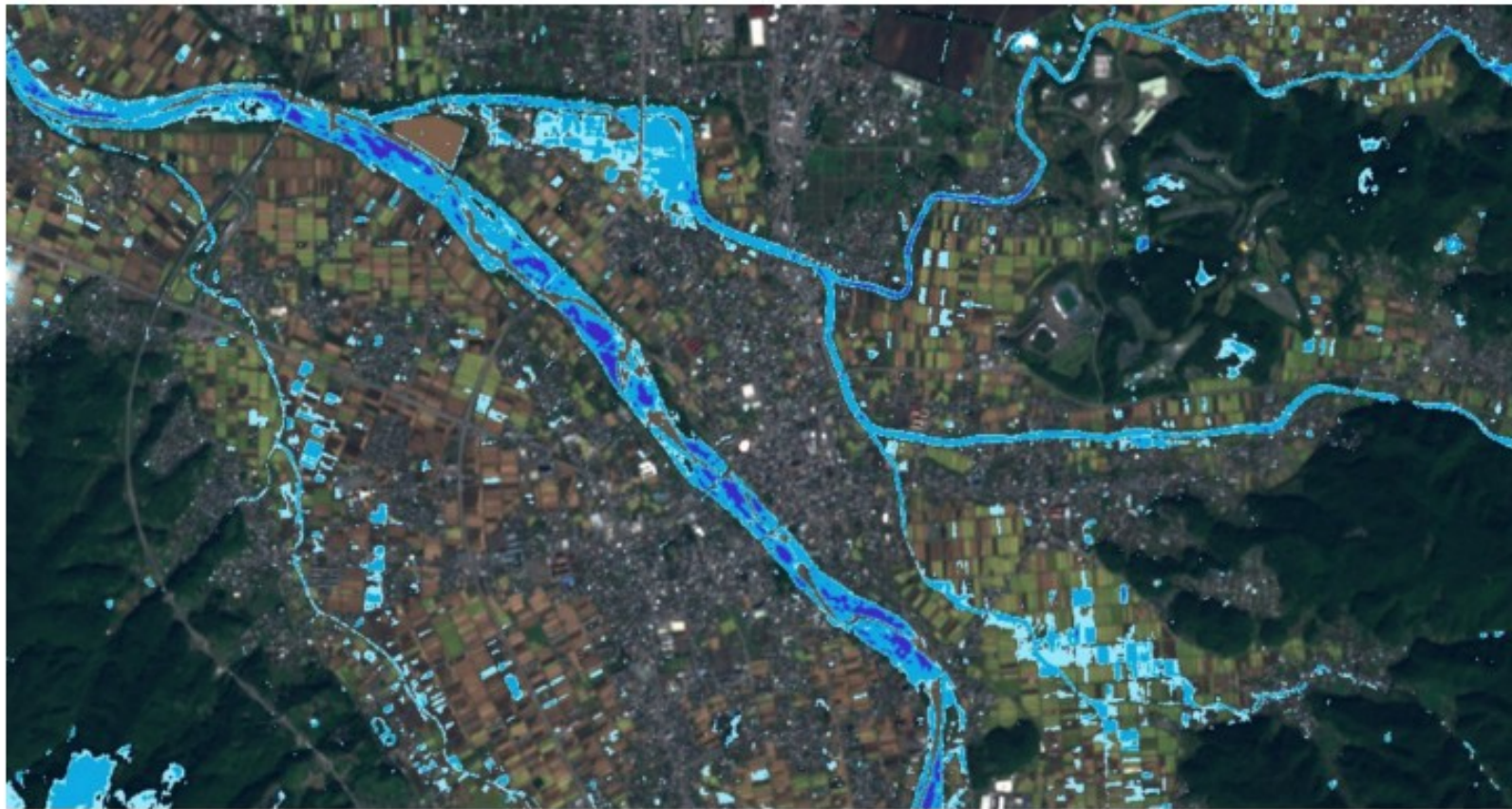


Fig. 1 Graphical Abstract: Inundation visualization of Saku, Nagano, Japan, created using Sentinel Hub.

# Camp Fire Caused Great Loss to the Green Land Cover in Paradise

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After the most destructive wildfire swept Paradise, California in 2018, the natural landscape was devastated within a week. Using the normalized difference vegetation index(NDVI) as a measure of green land cover, the picture on the right shows the area(marked in yellow and orange) that reduced sharply in the index after the fire.

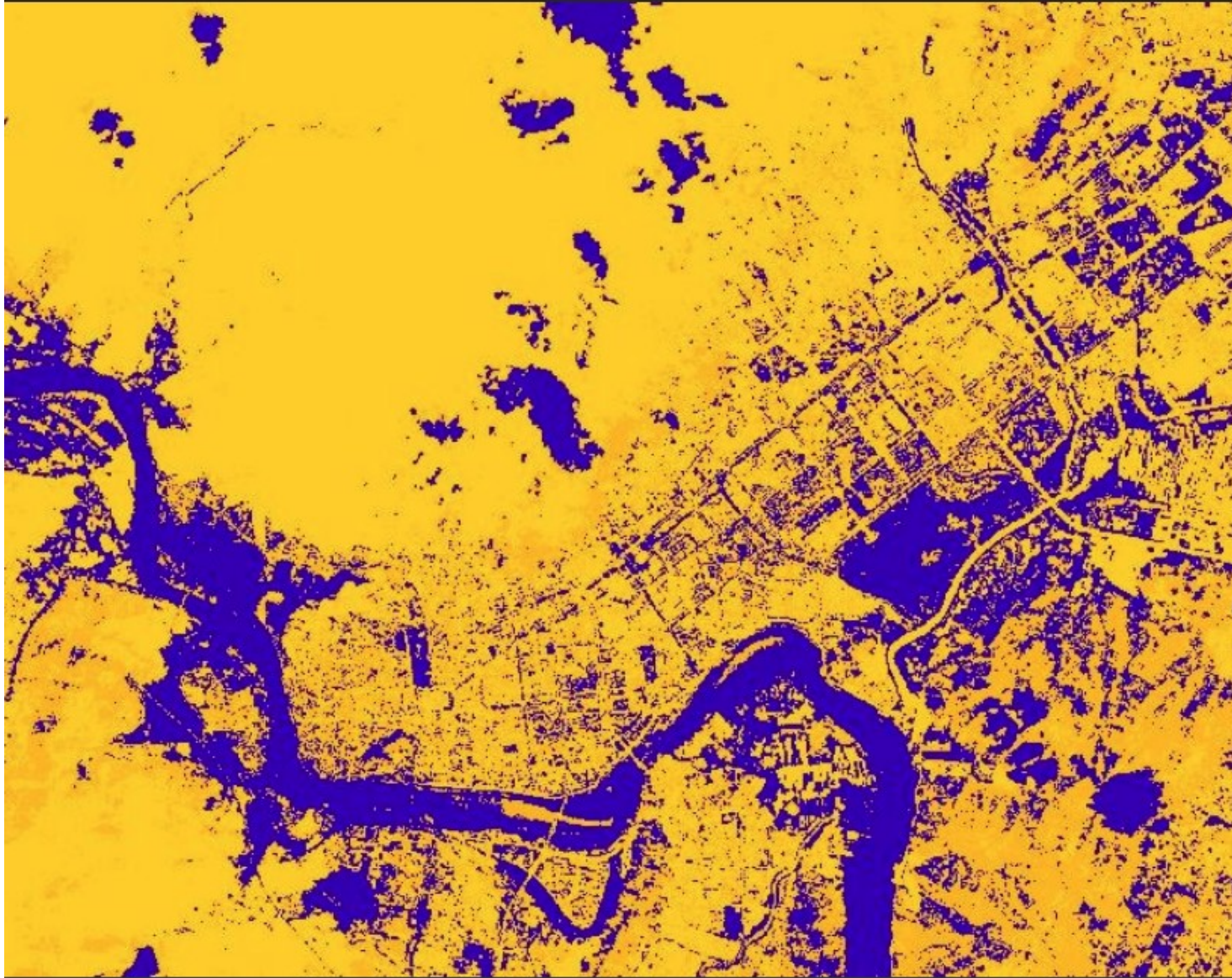
[Learn More](#)





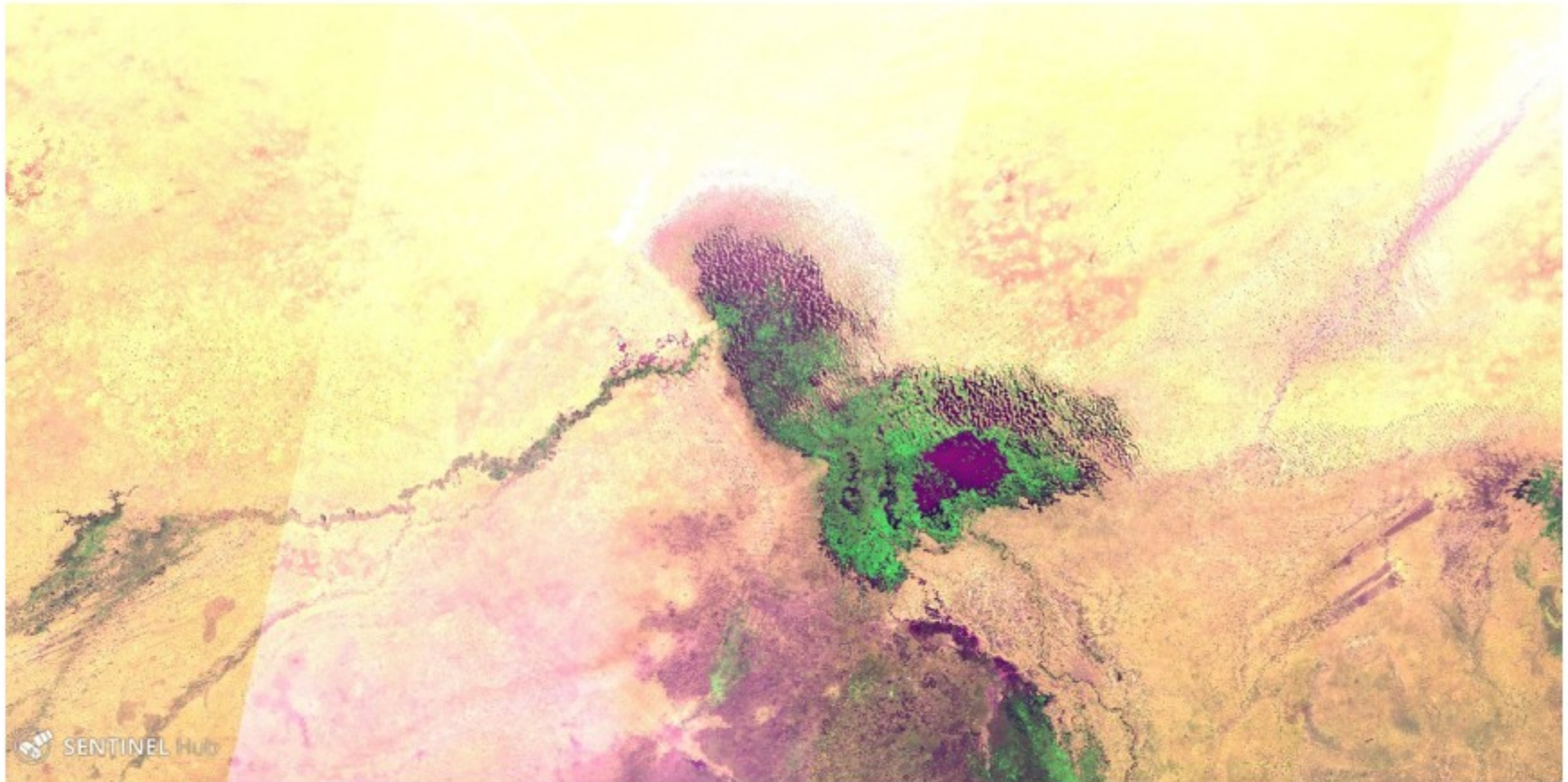
# Graphical Abstract

The city of Linhai, China flooded due to typhoon Lekima





## Graphical Abstract: The Ghost of Lake Chad



Despite having lost 90% of its area, the old footprint of Lake Chad is clearly visible from the vegetation that grows in the dried lakebed, visible in this false color Sentinel 2 satellite image from January 2020