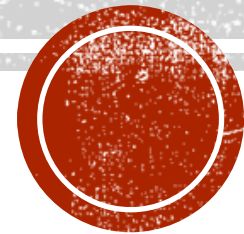# INFECTIOUS DISEASES GROUP

Antar Jutla, Chair

OUR WORKING AGENDA

- **1: Establish database on earth observation use in understanding modalities of infectious diseases**
- **2: Discussions on format of meetings**
- **3: Volunteering for position document on earth observations and pathogens of clinical importance.**
- **4: Health for all: Health and Environmental Equity through earth observation**

- For point 1:
  - Students from various labs can work on it, but this is a huge undertaking- and may need resources for updating this system. The database is critical but will require depth and breadth for consistency and coverage of infectious pathogens and associated diseases.
  - A post-doc at NASA or NOAA can help- and see if such resources can be developed.
  - Recruitment of students from various labs
  - Database should have query functions- such as studies for hypothesis, or application or mixed ones.
  - Broader questions need to be defined in terms of who will be the audience to use this data.

- For point 2:
  - A quarterly meeting format is acceptable at this stage. Schedule meeting after preliminary outputs (actionable) from Point 1

- For point 3:
  - A need for a review article that can summarize history of EO in predicting various infectious pathogens (or develop proxies for emergence of pathogens).
    - GeoHealth Climate change special section
    - https://agupubs.onlinelibrary.wiley.com/hub/journal/24711403/call-for-papers.html?pbEditor=true

- For point 4:
  - No discussion yet- will address in 2023.

WORK IN PROGRESS

- Experimental resources on where expertise exist.. Mapping, monitoring and following up with people, resources
  - Contacting appropriate volunteers for this task
    - Request all who are interested to complete the spreadsheet shared earlier
    - Link to map
    - https://remote-sensing-infectious-diseases-ufl.hub.arcgis.com/
    - Link to database
    - https://uflorida-my.sharepoint.com/:x:/g/personal/ajutla_ufl_edu/ETeOGJNB0J5ItQrBqV-oxIIBFxV_YoMdCMnd2qOABRrIYg?e=qUFa2m

- Showcasing our work for COP- products and services developed, limitations and further improvements.
  - Work in progress

Earth Observations and Infectious Diseases

Antar Jutla & Members of GEO Infectious Disease Small Group
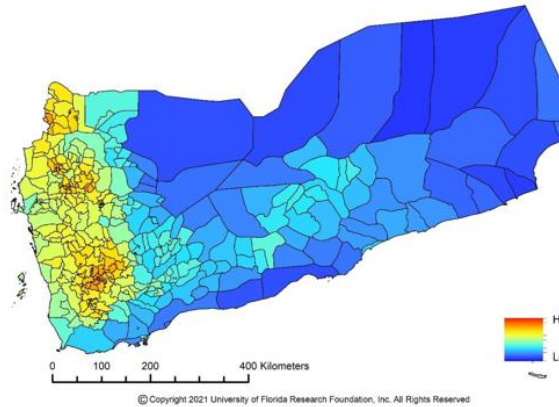University of Florida, Gainesville, FL

Abstract

Improve prediction and prevention systems for environmentally-sensitive infectious diseases to help reduce risks for human health by application of Earth Observations (EO) to enhance decision-relevant risk monitoring, with particular focus on underserved communities.

1) Develop a generalization framework for incorporating climatic and environmental data for enhancing predictive and decision-making mapping capacity to serve as the EO backbone for water- air- and vector-borne diseases; and

2) Develop platform for the monitoring and prediction of emerging pathogens and toxins risk in marine and coastal environments coupled with critical EO-derived coastal and inland water quality parameters.
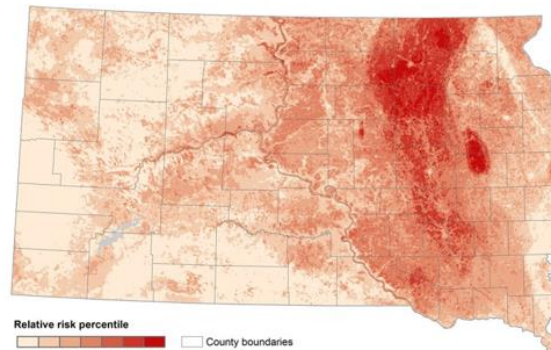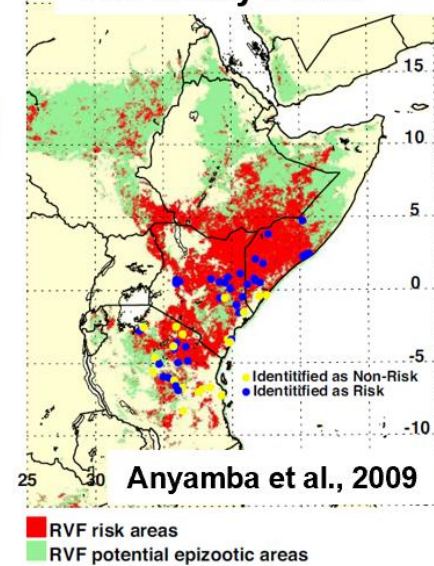
Examples of application of EO
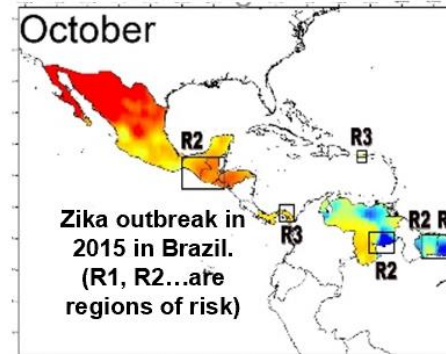
Cholera

Jutla et al., 2021

West Nile Virus

Relative risk percentile

0-24 25-49 50-74 75-89 90-94 95-98 99-100

County boundaries
No Data

Hess et al., 2018

Rift Valley Fever

Identitified as Non-Risk
Identitified as Risk

Anyamba et al., 2009

RVF risk areas
RVF potential epizootic areas

Zika

October

R2   R3
R3   R2 R3
R3
R2

Zika outbreak in 2015 in Brazil. (R1, R2...are regions of risk)

Jutla et al. (under review)

Discussion points

- Identification of critical EO and prediction requirements for health, specifically for evolutionary aspects of pathogens.

- What data, surveillance systems and tools are currently being used?

- What data and surveillance systems and tools are required to be able to measure risk of disease outbreak in future?

- Enhance integrated modeling of disease risk or prediction of environmental drivers of disease and other health outcomes.

- Understand links between environmental and climate change, food quality and nutrition, and health.

- Predict when, how, and where diseases will emerge and identify the populations most at risk and most vulnerable

- Earth observation and health equity justice

- Communication across aisle (other disciplines)