GEERU workshop

Day two synthesis

GEERU's mandate

"Our capability to rapidly identify, characterize, control, and eradicate new emerging animal pathogens is not well developed. Accordingly, emphasis will be given to filling gaps in our toolbox for predicting the emergence of new pathogens."

endemic

Objective 1: Develop the data sets and analysis pipelines needed for predicting and modeling the emergence of new pathogens.

Examples

- Integrated predictive modeling capability for emerging infectious diseases of animals and the collection of data to support these models.
- Comprehensive maps of virus-host interactions required for pathogens to adapt to new hosts.
- Identification of molecular determinants that enable emerging pathogens to infect new animal hosts, including humans.
- Three-dimensional epidemiological information, integrating metagenomics with climatic and ecological data.
- Multi-scale big-data integration models for predicting the emergence of new pandemic pathogens.
- Determine quantifiable species-specific transmission parameters of emerging pathogens for modeling and outbreak preparedness.
- Methods to rapidly detect and characterize the etiology of new and emerging diseases.
- Develop standardized systems for data collection and integrative analysis.
- Conduct the molecular characterization of emerging pathogens including phylogenetic analysis and network analysis.
- Conduct large-scale genomic sequencing to improve the surveillance of mutations that lead to new pathogenic variants.
- Develop integrated techniques from spatiotemporal epidemiology, ecophylogenetics, and distributional ecology.

Day two research area evaluations

- Your group will analyze three potential research areas for the unit.
- We have provided some topics to select from, your group may also pick a different topic.

Day two research areas

Potential areas to evaluate. You may also come up with your own

- Data products and data integration
- Genomic or phylogenetic models, molecular epidemiology
- Mechanistic models or epidemiological models for prediction and scenario testing
- Diagnostic methods or population disease surveillance tools

SOAR+ evaluation method

Strengths, Opportunities, Aspirations, and Results

- Identify example needs within area from APHIS, CDC, USGS USFWS…
- Strengths: Identify resources the ARS and MSU have in the area
- Opportunities: Identify specific example projects that could address needs
- Aspirations: What are hard or currently impossible things that if solved could have a revolutionary impact
- Results: What are tangible results that the unit could achieve in this area
- Timeline and resources needed for any specific projects