

One Health Surveillance Data: Sharing, Standards, and Stories

Noam Ross

BOHRN Meeting

Phuket, Thailand July 2019



EcoHealth
Alliance

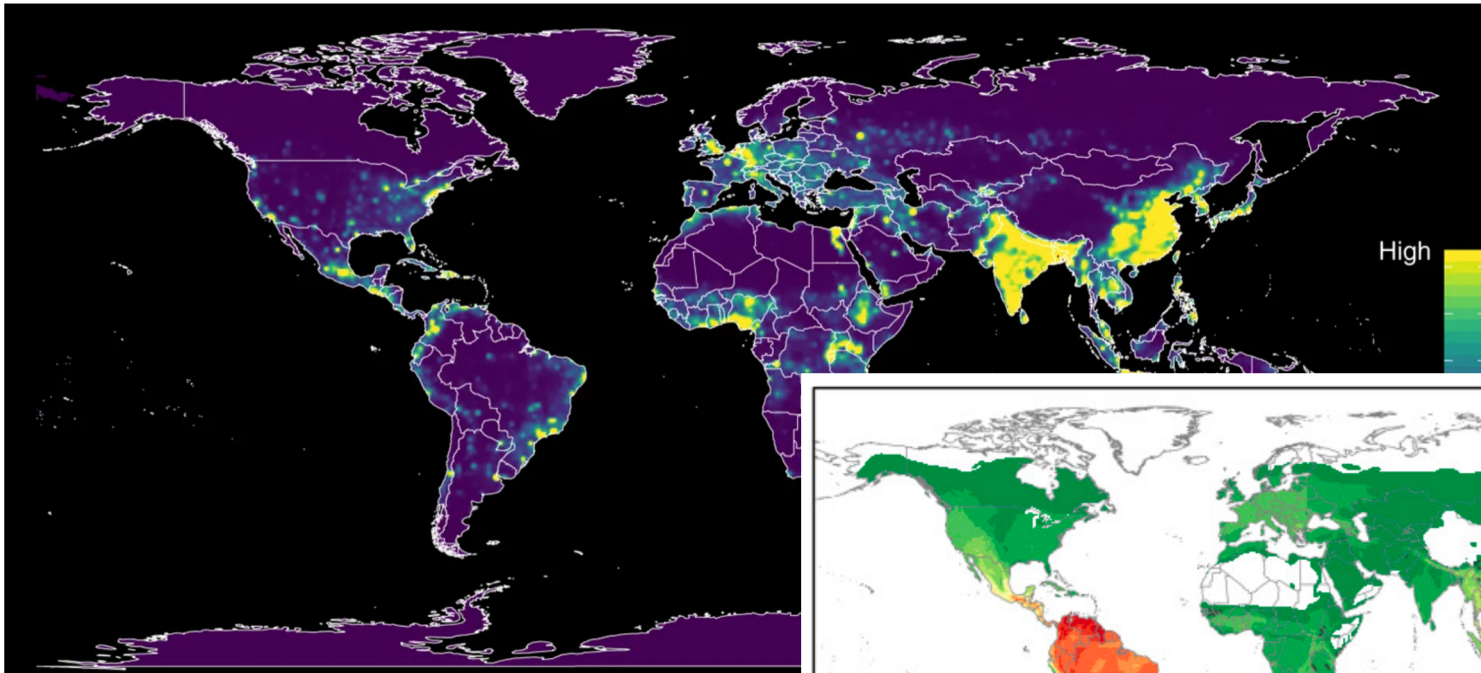


BOHRN

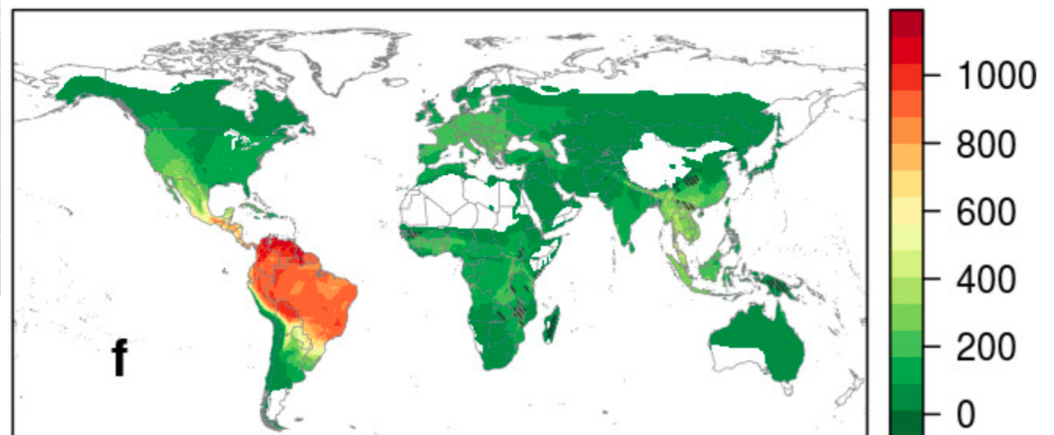
Goals

- "Formalize community standards...for one health disease research"
- "Create...collaborative and sustainable projects"
- "Facilitate interdisciplinary collaboration"
- "Enable better communication, coordination, and outreach"

The Anarchy of Data

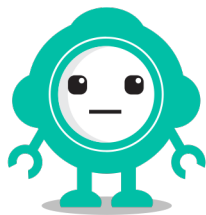


Allen et al (2017)

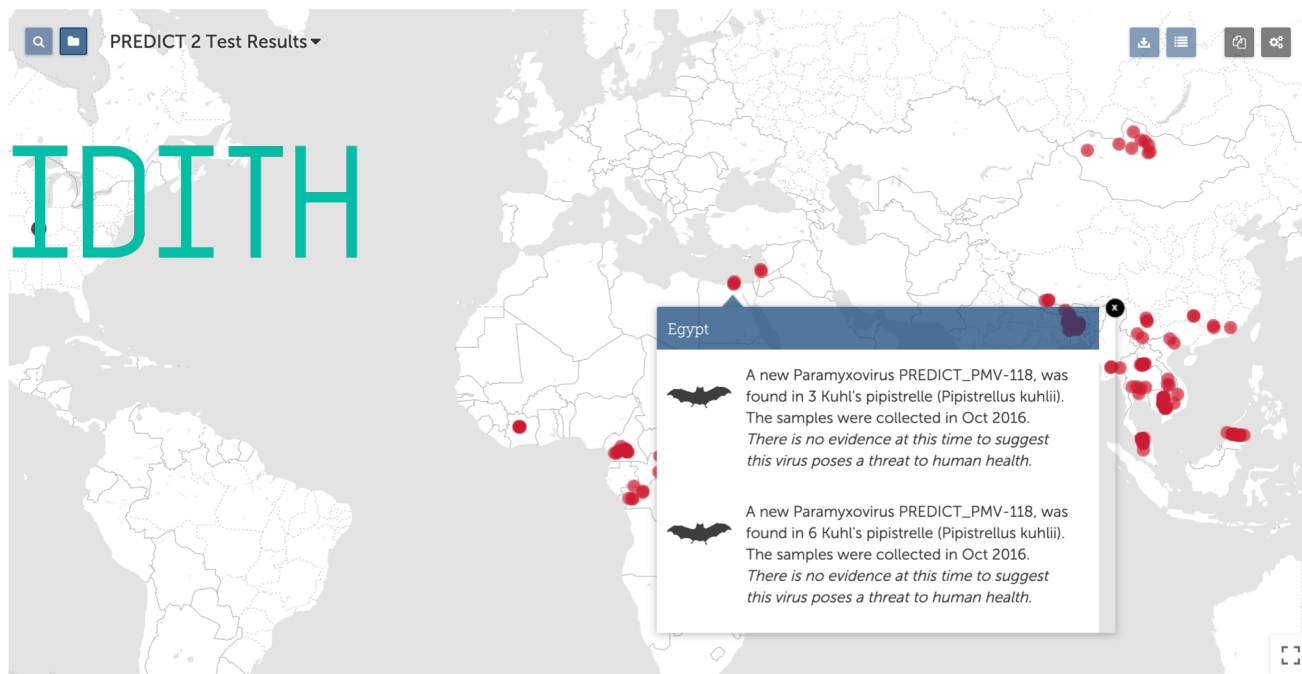


Olival et al (2017)

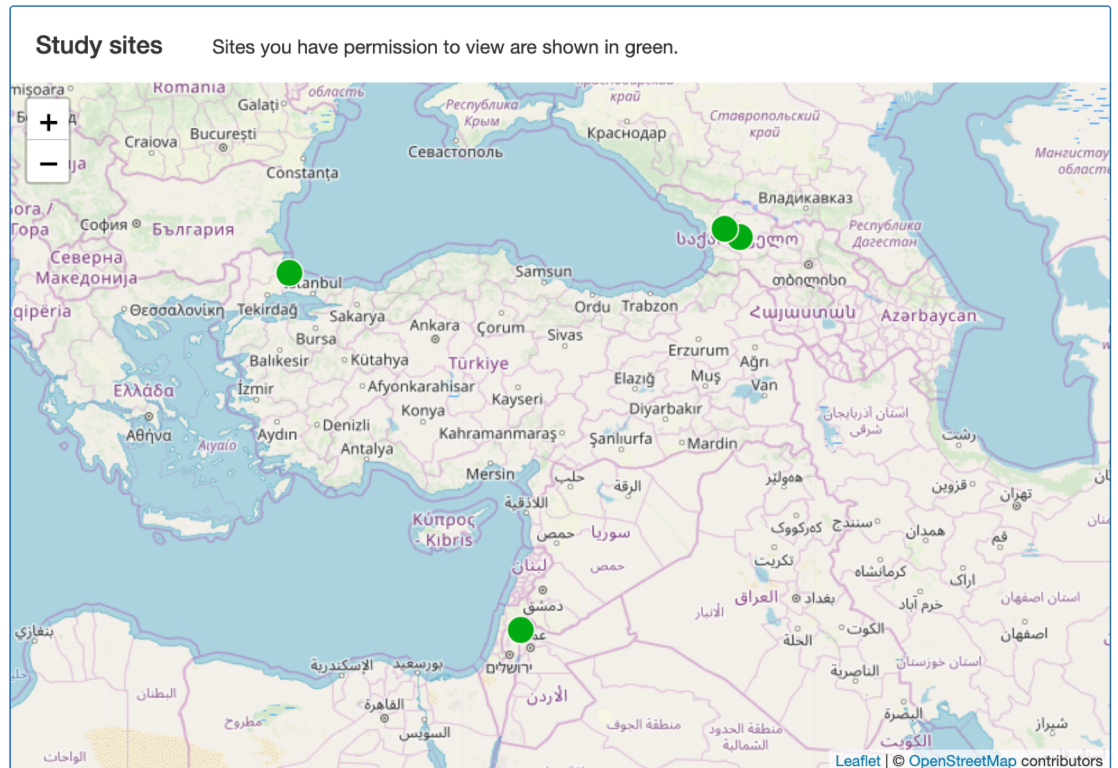
Project Databases



EIDITH



Project Databases



Rousettus aegyptiacus

35 samples

***Rhinopoma
microphyllum***

60 samples

Rhinopoma cystops

2 samples

***Miniopterus
schreibersii***

108 samples

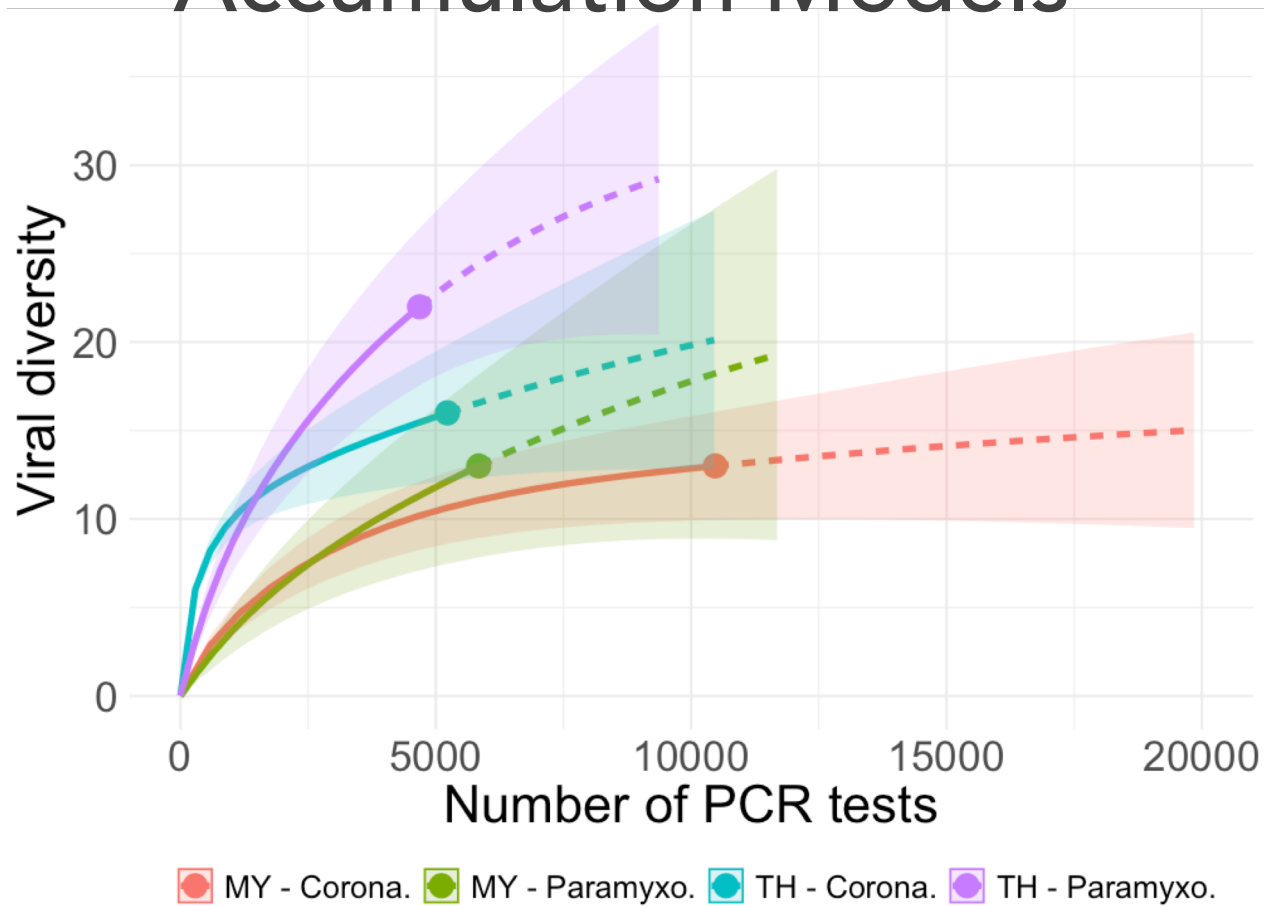
[illegible]

| Virus Name | Number of Detections | Taxa Groups | Species Names | Site Names | Concurrent Detections |
|---------------------------------|-------------------------|----------------|--|--|---|
| Bat coronavirus 1 | 1 | bats | Miniopterus schreibersii | Khao Chakan | China |
| Lonquan Aa mouse coronavirus | 1 | rodents/shrews | Bandicota savilei | Loei-Kang Muang-R | Cambodia |
| Murine coronavirus | 43 | rodents/shrews | Maxomys surifer Mus cervicolor Mus cookii Niviventer fulvescens Rattus exulans Rattus sp. Rattus tanezumi Rodentia | Loei-Phu Luang Forest Loei-Phu Khor Phu Kratae- R Loei-Kang Muang Loei-Santom Loei-Kang Muang-R Loei-Nong Hin Village Loei-Phu Khor Phu Kratae Ratchaburi-Wat Khao Chong Pran-R Loei-Santom-R Loei-Maholan Cave Loei-Phu Ruea Market Loei-Phu Ruea Market-R | Bangladesh Cambodia Malaysia Nepal |
| PREDICT_CoV-17 | 42 | bats | Pteropus giganteus Pteropus lylei | Chonburi-Wat Luang Temple-B Chonburi-Wat Luang Temple | Bangladesh |





Assessing Sampling with Viral Accumulation Models



Scientific Archives



Knowledge Network
For BioComplexity



GenBank



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▶ Data files

▶ Creator

▶ Year

▶ Identifier

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▶ Location

DATASETS 1 TO 25 OF 27,542

1

2

3

...

1,102

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Ganesh Marín, Victor Arroyo-Rodríguez, Rodrigo Sierra-Corona, Eduardo Ponce-Guevara, and Gerardo Ceballos. 2019. **Ocurrence data base of the mountain carnivores in Northwestern Mexico, script and matrix for model the diversity and habitat use for each species.** Knowledge Network for Biocomplexity. doi:10.5063/F1639N12.



Stephen Hovick. 2019. **The independent effects of nutrient enrichment and pulsed nutrient delivery on a common wetland invader and its native conspecific.** Knowledge Network for Biocomplexity.

doi:10.5063/F1BV7DXW.



Edward Otis and Joseph Loboy. **Lower Cook Inlet Salmon Escapement Database, 1927–2018.** Knowledge Network for Biocomplexity.

doi:10.5063/F14B2ZMJ.



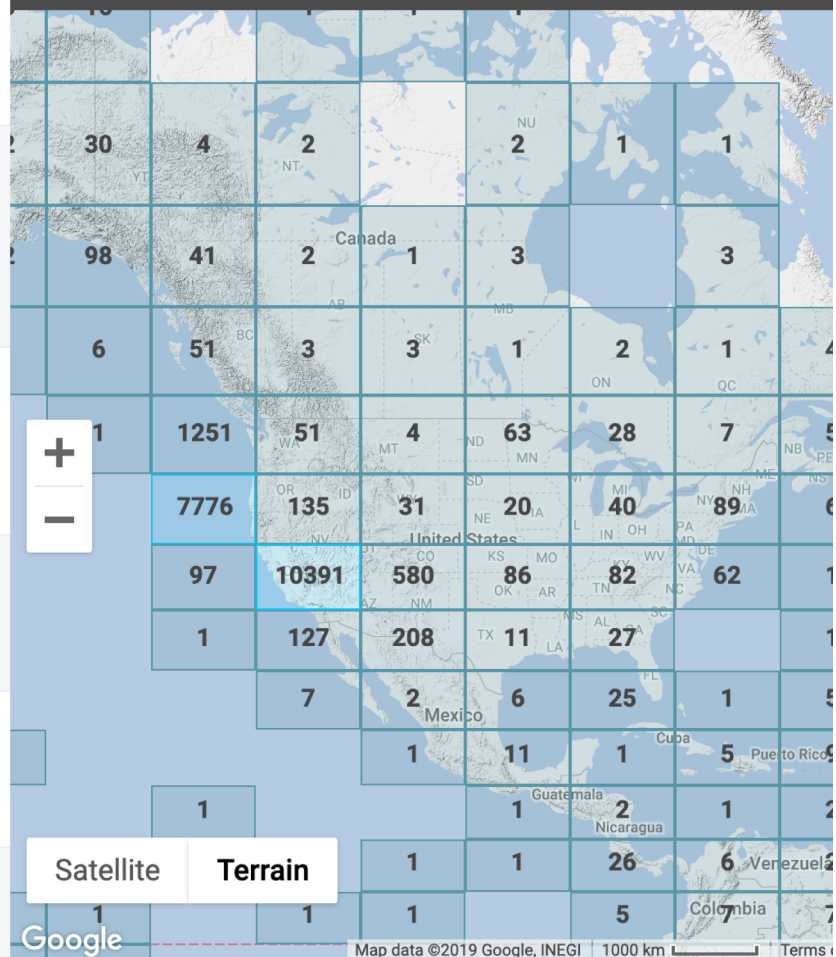
Ariel Simons. 2019. **Benthic macroinvertebrate community count data. California streams (1994 - 2016).** Knowledge Network for Biocomplexity.

doi:10.5063/F10K26VR.




Stephanie Pau. 2023. **Leaf and reproductive litterfall from Laupahoehoe, Hawaii from October 2009 to July 2018.** Knowledge Network for Biocomplexity. urn:uuid:f3a91e26-03a9-449c-8e6a-04a137f8d139.

Hide Map »



Metadata Standards



Darwin Core

Darwin Core is a standard maintained by the Darwin Core maintenance group. It includes a glossary of terms intended to facilitate the sharing of information about biological diversity by providing identifiers, labels, and definitions. Darwin Core is primarily based on taxa, their occurrence in nature as documented by observations, specimens, samples, and related information.



Ecological Metadata Language



Secondary Linking Databases



BAT ECO-INTERACTIONS



EcoHealth Alliance



mangal.io

Welcome to the
Global Mammal Parasite Database



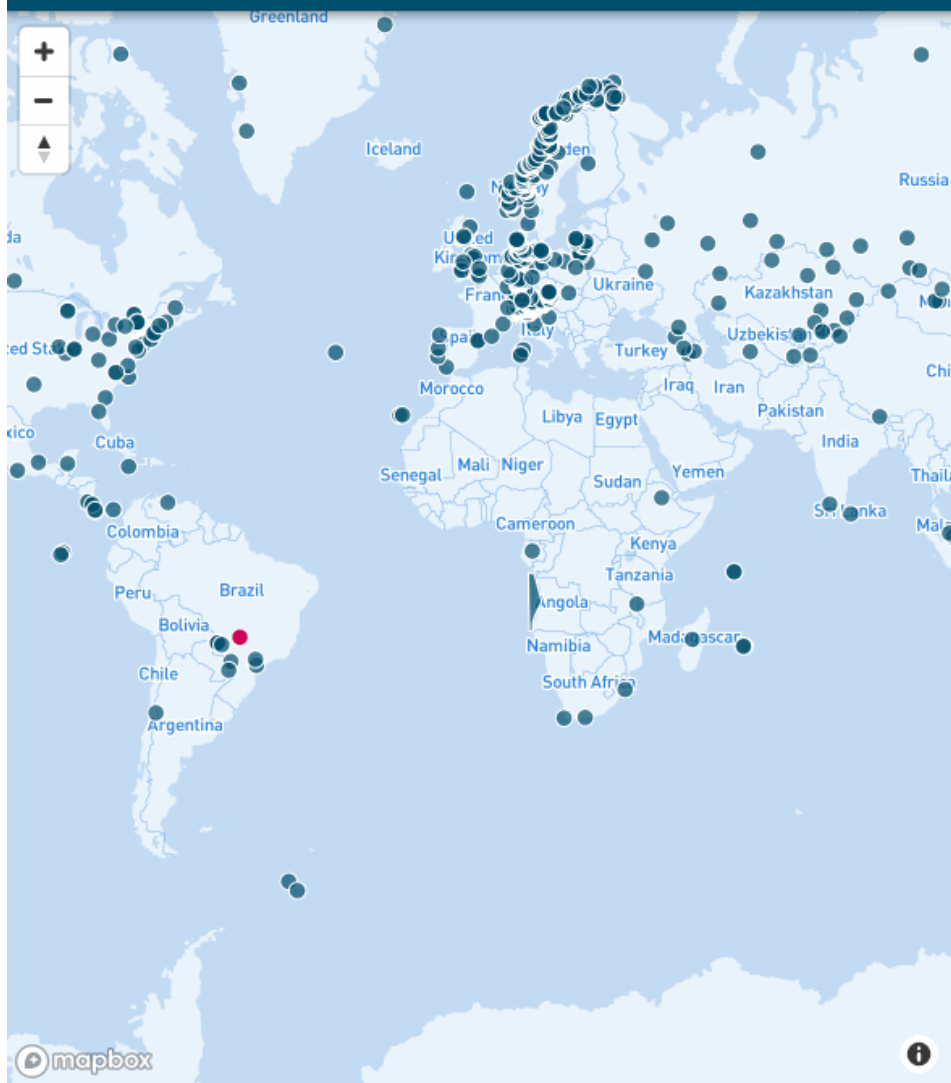
BOHRN



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Example queries: [What do sea otters \(*Enhydra lutris*\) eat?](#) or [What do honey bees \(*Apis*\) pollinate?](#)

What kind of do according to
?



NETWORK

NODE PROPERTIES

INTERACTIONS LIST

DATASET

Interaction of a mixed food web in the Corrente River in the Paraná River Basin

Mangal network ID #1448, measurement date: 2003-05-01

Public

Unrecorded absences

Number of nodes

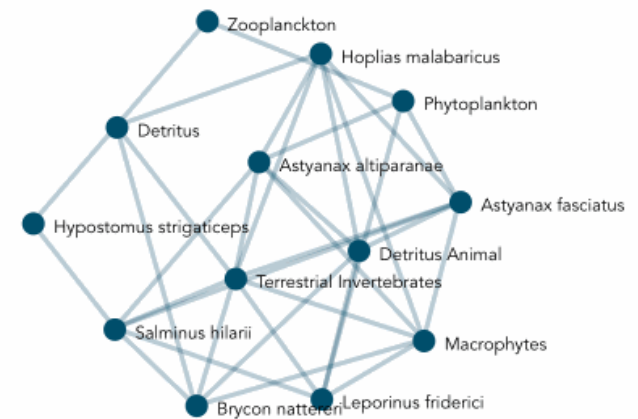
13

Number of interactions

34

Connectance

0.20

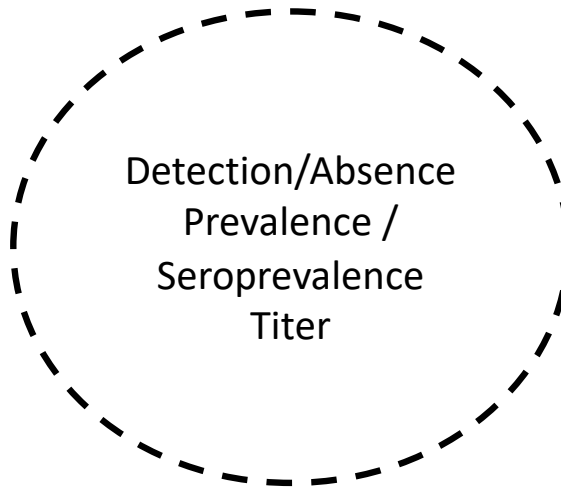


Ontologies / Vocabularies

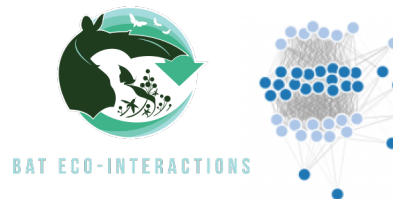
- Host Species (ITIS, CoL)
- Pathogen Species (ICTV)
- Interaction Types
- Assays and methods
- Units of measure

The Gap for Disease Surveillance Data

Disease State Information



GloBI



| Event ID | Lat | Long | Time | Habitat... |
|-------------|-------------|---------------|----------------|---------------------|
| | | | | |
| Animal ID | Event ID | Species | Sex | Mass... |
| | | | | |
| Specimen ID | Animal ID | Specimen Type | Storage Medium | Storage Location... |
| | | | | |
| Test ID | Specimen ID | Test Type | Test Result | Sequence... |
| | | | | |
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Options for BOHRN

- Premier One Health Surveillance Database
- Centralized BOHRN database
- A common One Health Data Standard
- Layer on top of existing databases
- Centralized metadata store
- Communications portal and directory

Over to You

Options

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Challenges and Considerations

- Differential privacy
- Human subjects data
- Incentives, Effort, Training
- Existing workflows and systems
- Staleness and sustainability
- Capturing other activities and capacities

Challenges and Discussion Points

- Differential privacy
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