Joel Sartore, Brian Freiermuth

AmphibiaWeb's Response to Address the Global Crisis in Amphibians

On behalf of the AmphibiaWeb Team

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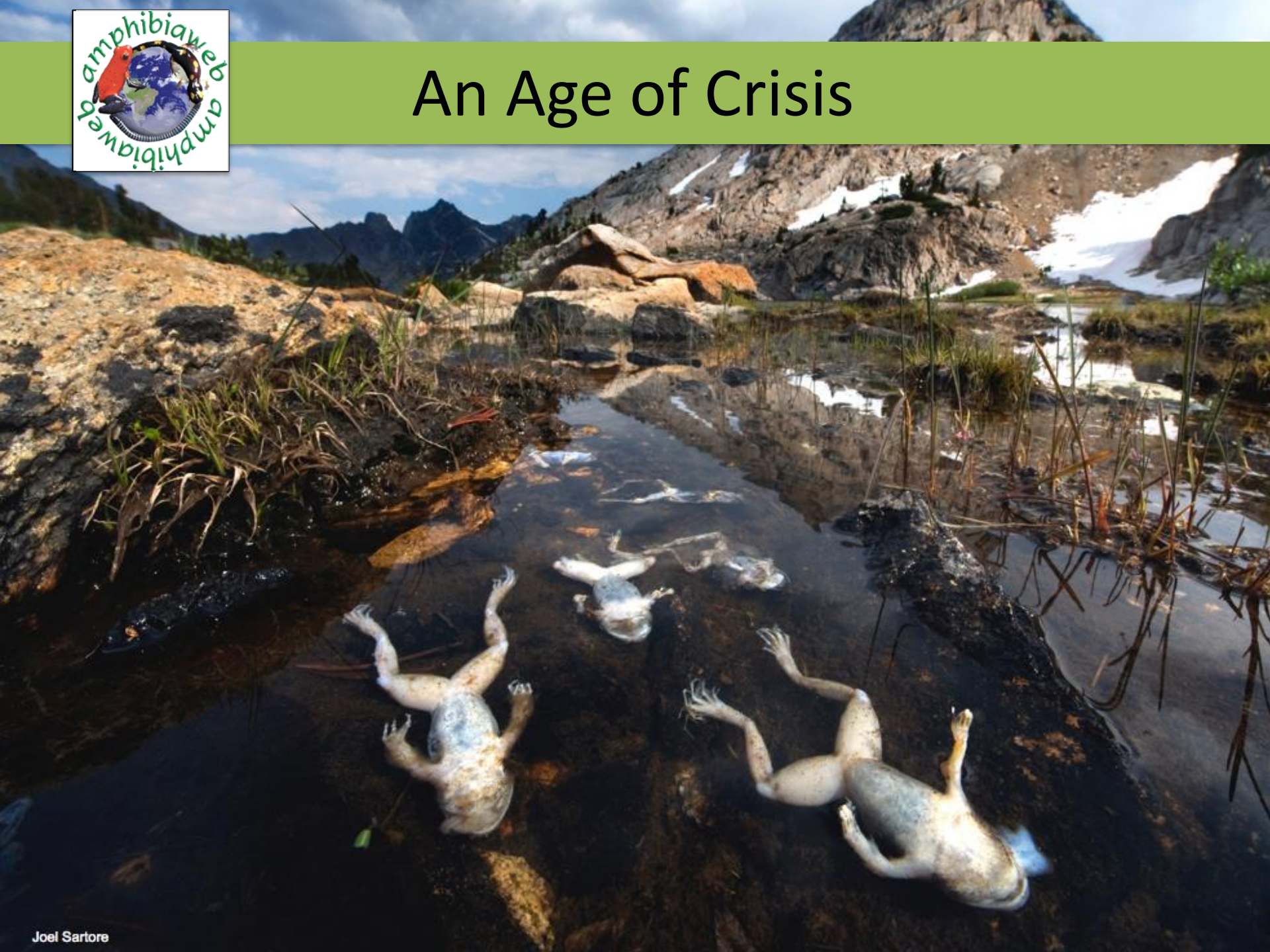
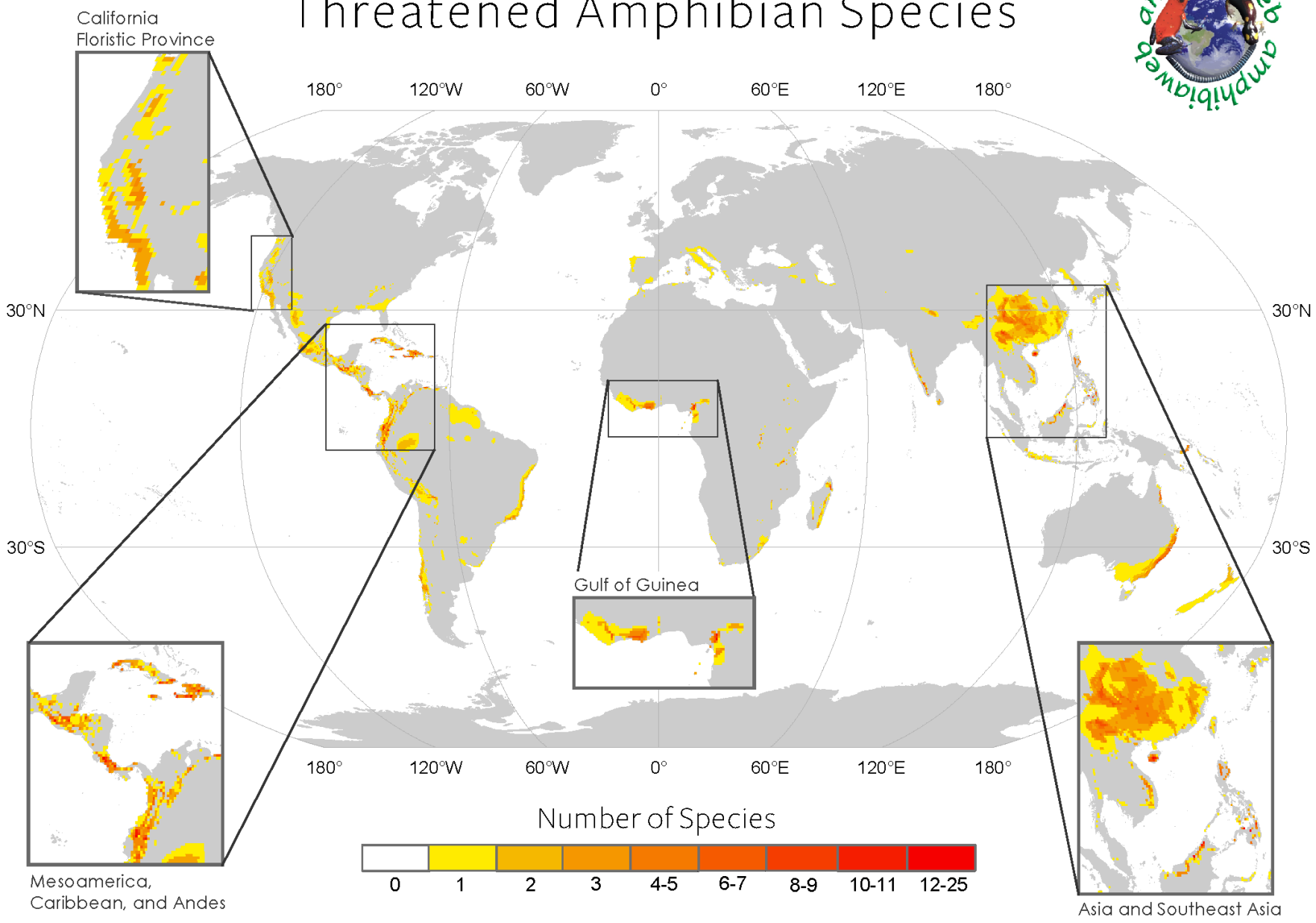
An Age of Crisis



Threatened Amphibian Species



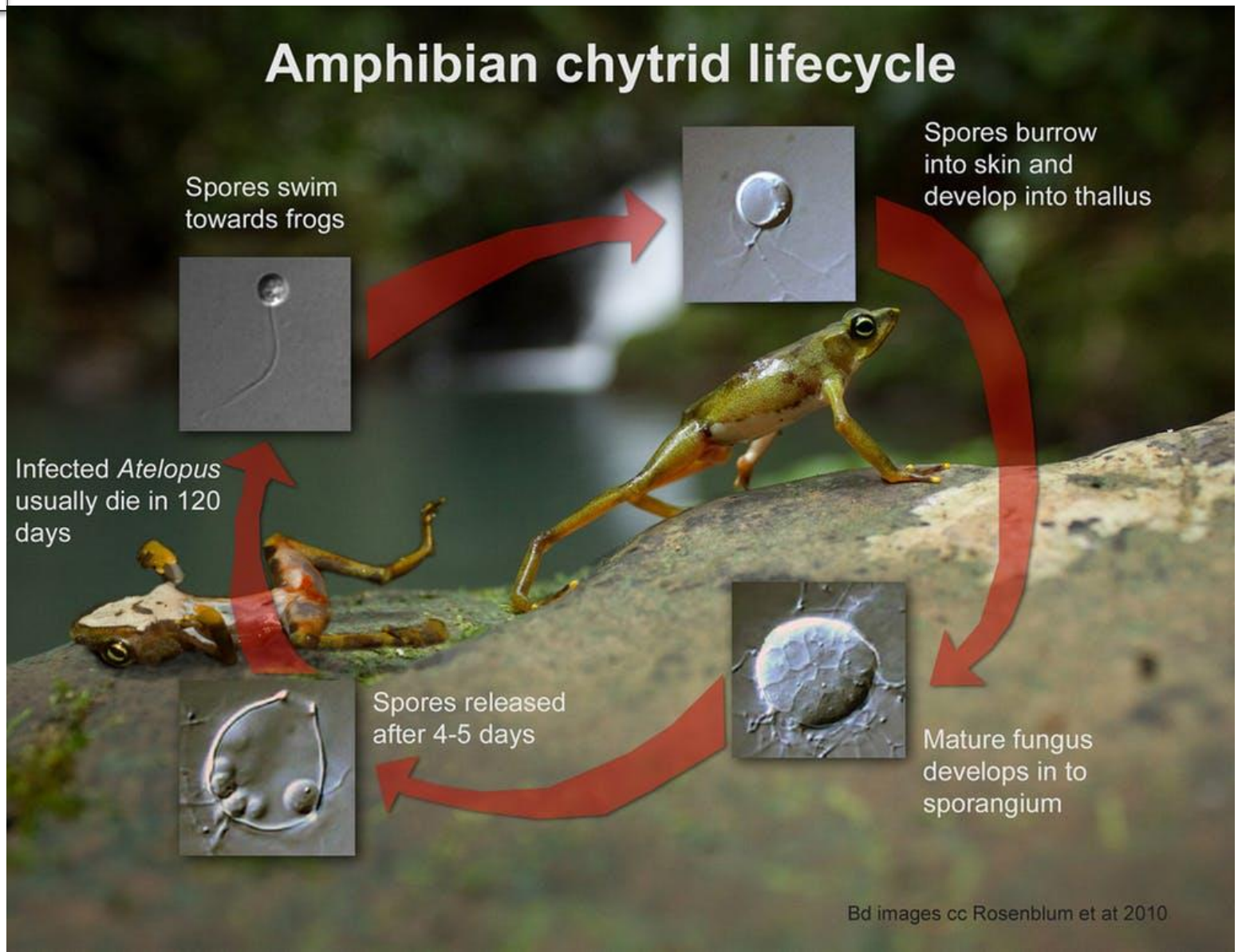
Data Sources: AmphibiaWeb, IUCN. 2017.

About AmphibiaWeb

Our Mission Since 1999:
Address global amphibian declines and conservation efforts by providing information on amphibian biology, natural history, conservation, and species diversity

AmphibiaWeb.org

Global Threat to Amphibians



Batrachochytrium salamandrivorans

Discovered in 2013

Hypothesized to originate in Asia

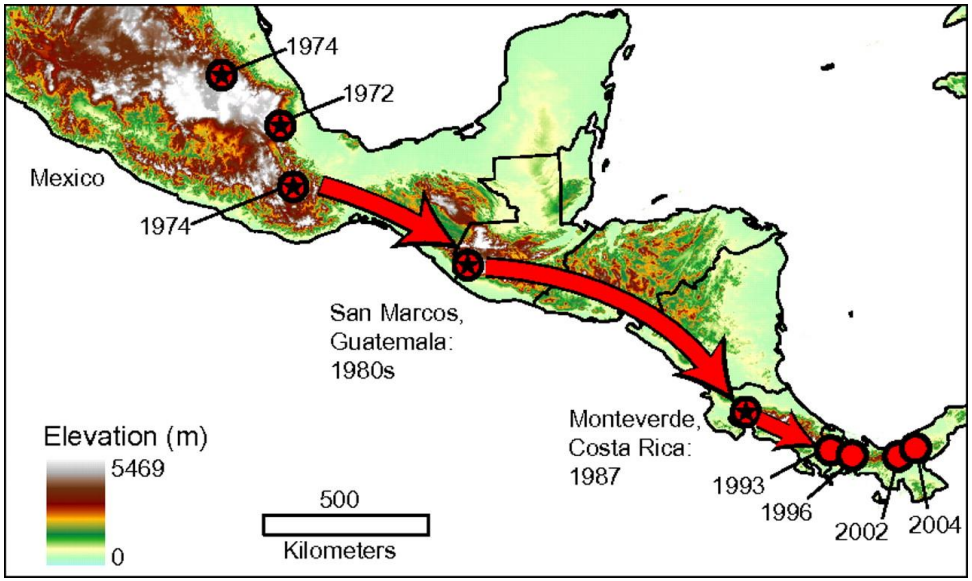
Traveled via pet trade to Europe

Selectively impacts salamanders

Need Data to Inform Responses

- Where have *Bd* and *Bsal* been found?
- Where are the sudden outbreaks of *Bd*/*Bsal*?
- Which species have been tested with *Bd* /*Bsal?*
- Are there geographic or temporal patterns?
- Are their patterns in life history traits?
- How has the distribution, prevalence and intensity changed over time and space?
- Are there collaborators in my region?
- Are there labs that can test samples?

We can learn from the *Bd* global pandemic

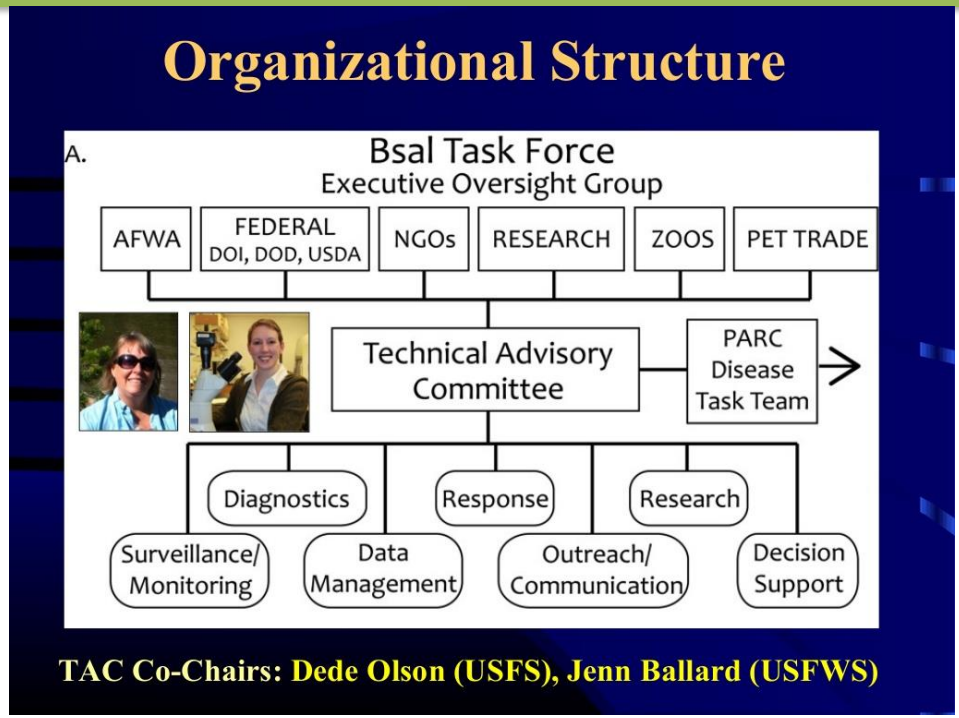


- *Bsal* has spread 60 km in 5 years – Netherlands to Belgium, and Germany
- First *Bsal*-killed salamanders in UK in April 2015
- Severe, irreversible threat
- ADVANTAGE: We may have detected it early.
- Lesson Learned: DATA is the key!

Lessons from *Bd* global pandemic

Organize early: June 2015

Bsal Task Force formed from international workshop



Salamander chytrid fungus (*Batrachochytrium salamandrivorans*) in the United States—Developing research, monitoring, and management strategies

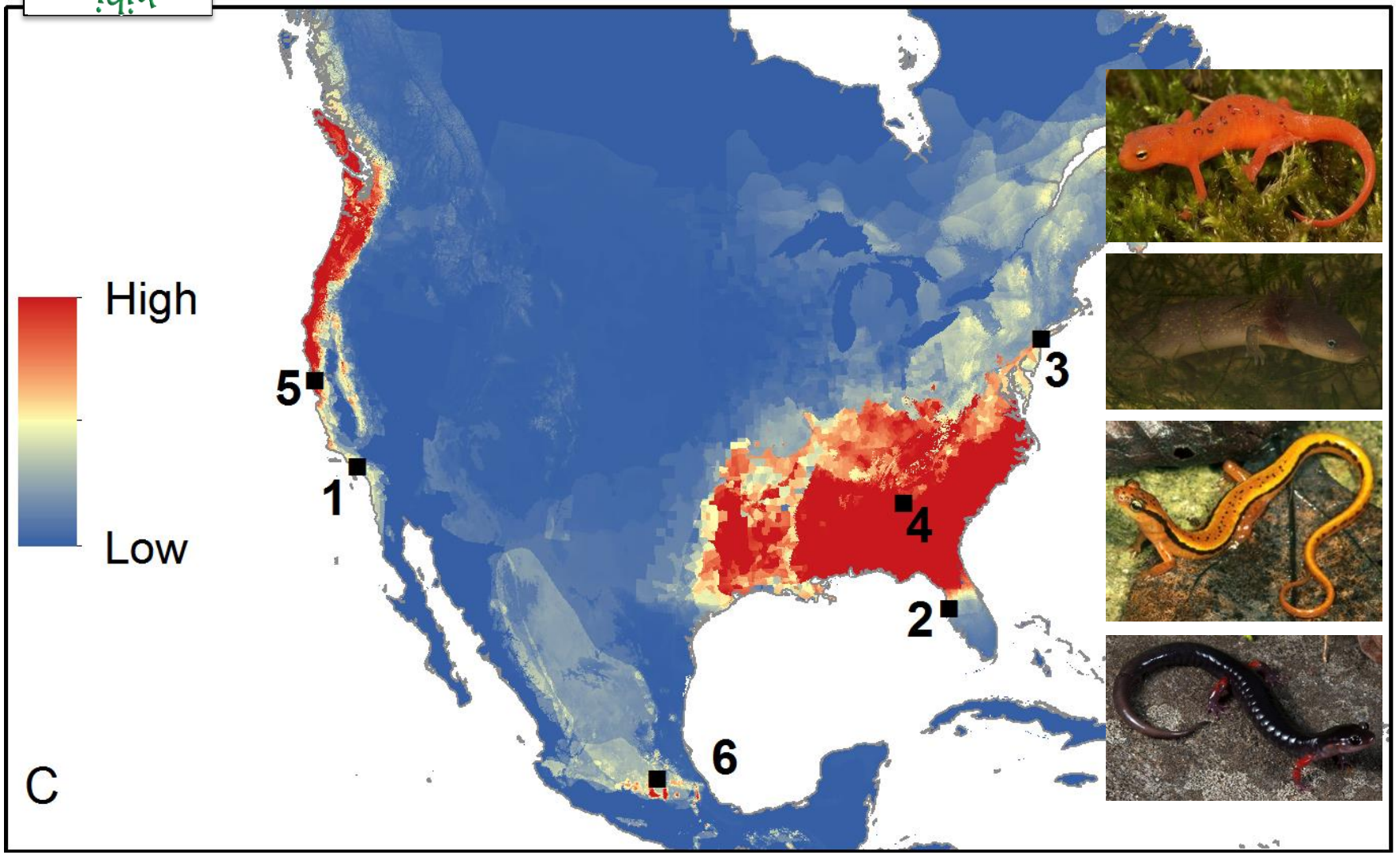
Open-File Report 2015-1233

By: Evan H. Campbell Grant , Erin L. Muths , Rachel A. Katz , Stefano Canessa , Michael J. Adams , Jennifer R. Ballard , Lee Berger , Cheryl J. Briggs , Jeremy Coleman , Matthew J. Gray , M. Camille Harris , Reid N. Harris , Blake R. Hossack , Kathryn P. Huyvaert , Jonathan E. Kolby , Karen R. Lips , Robert E. Lovich , Hamish I. McCallum , Joseph R. Mendelson III , Priya Nanjappa , Deanna H. Olson , Jenny G. Powers , Katherine L. D. Richgels , Robin E. Russell , Benedikt R. Schmidt , Annemarieke Spitzen-van der Sluijs , Mary Kay Watry , Douglas C. Woodhams , and C. LeAnn White

https://doi.org/10.3133/ofr20151233

Tweet

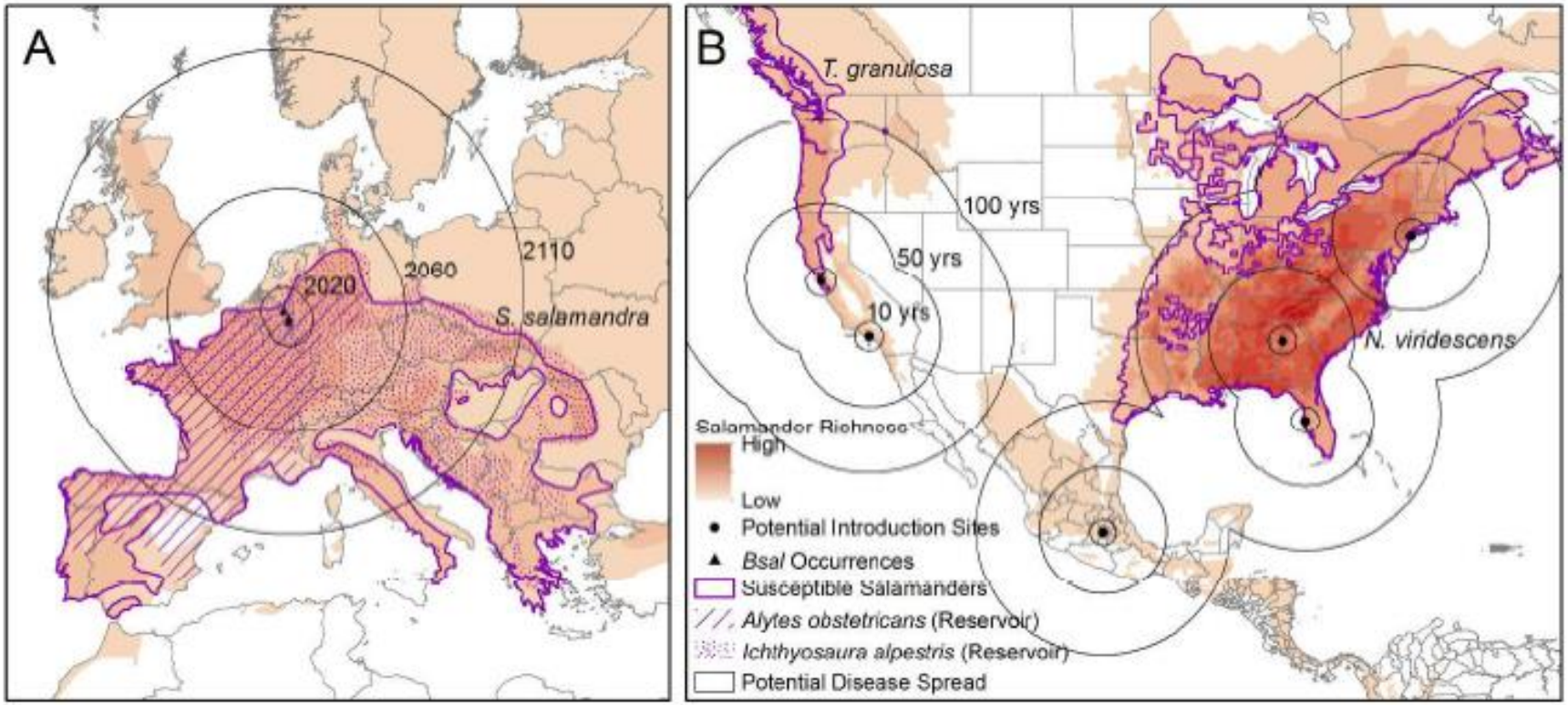
Salamander Vulnerability to *Bsal*



Yap, Koo, Ambrose, Wake & Vredenburg, 2015, *Science*

Photos by Henk Wallays and Todd Pierson

We can learn from the *Bd* global pandemic



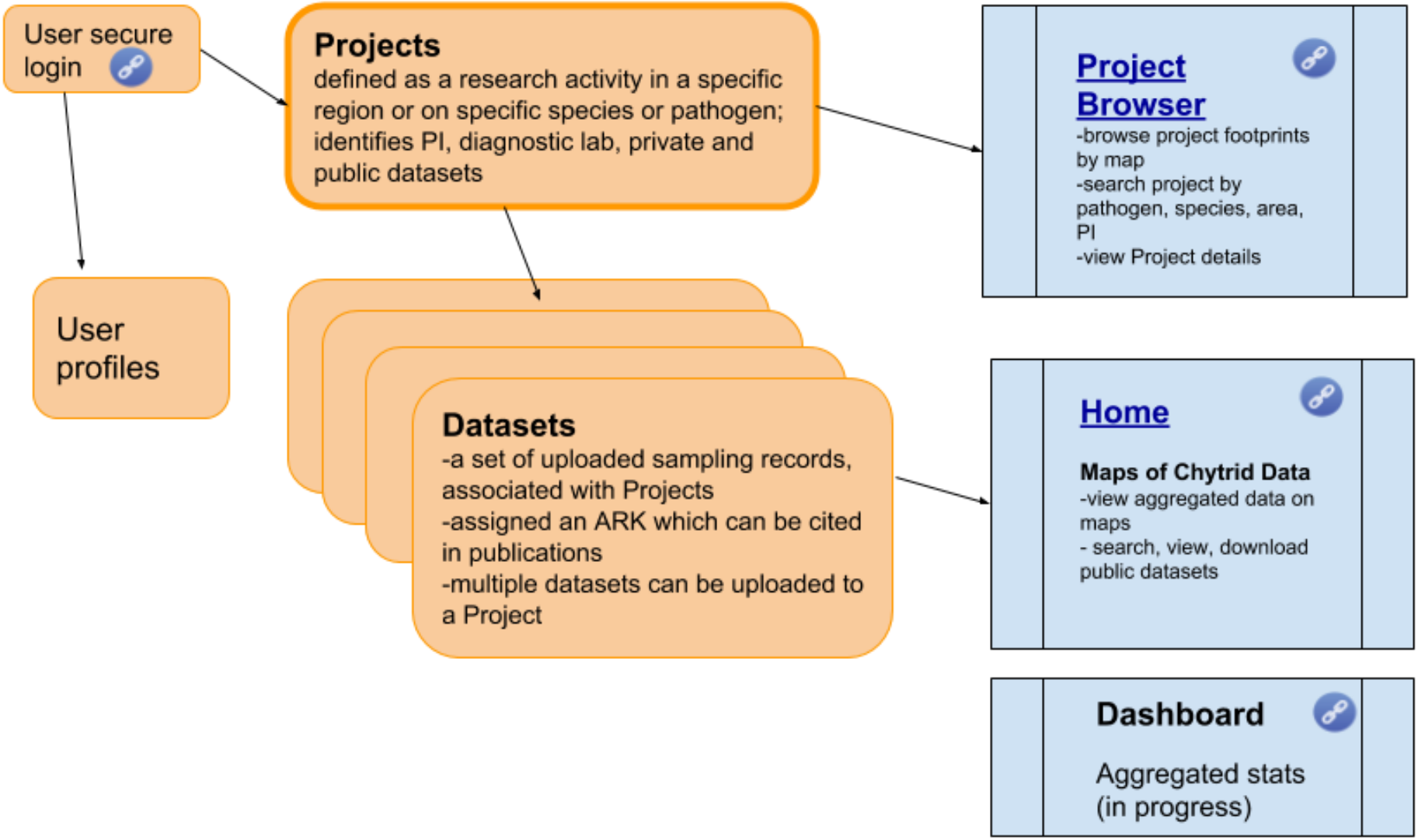
Yap, Nguyen, Serr, Shepack & Vredenburg, 2018, *Ecolhealth*

AmphibiaWeb's Response

- Data repository for *Bd/Bsal* test results
- Collaboration with US Forest Service to create a central data portal
  - Will include '*Bd*-maps' data
  - Will allow both field or museum samples
- Increase impact of research
  - Work with editors to encourage authors to make data available (e.g., *Herpetological Review*)
- Community feedback requested!

AmphibianDisease.org model

AmphibianDisease.org



AmphibianDisease.org

Amphibian Disease Project Browser

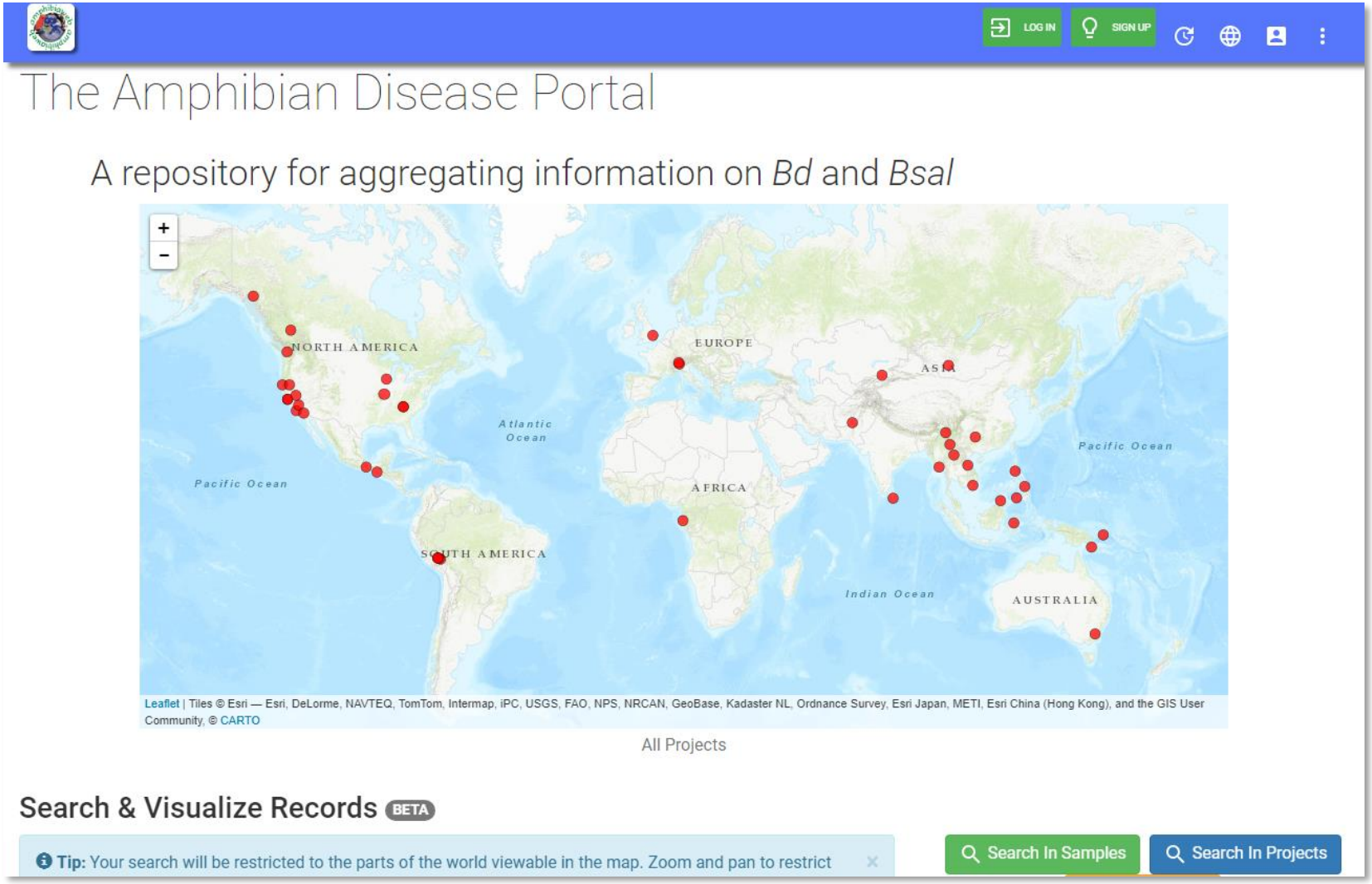
Community Project Map

Only show projects in map view

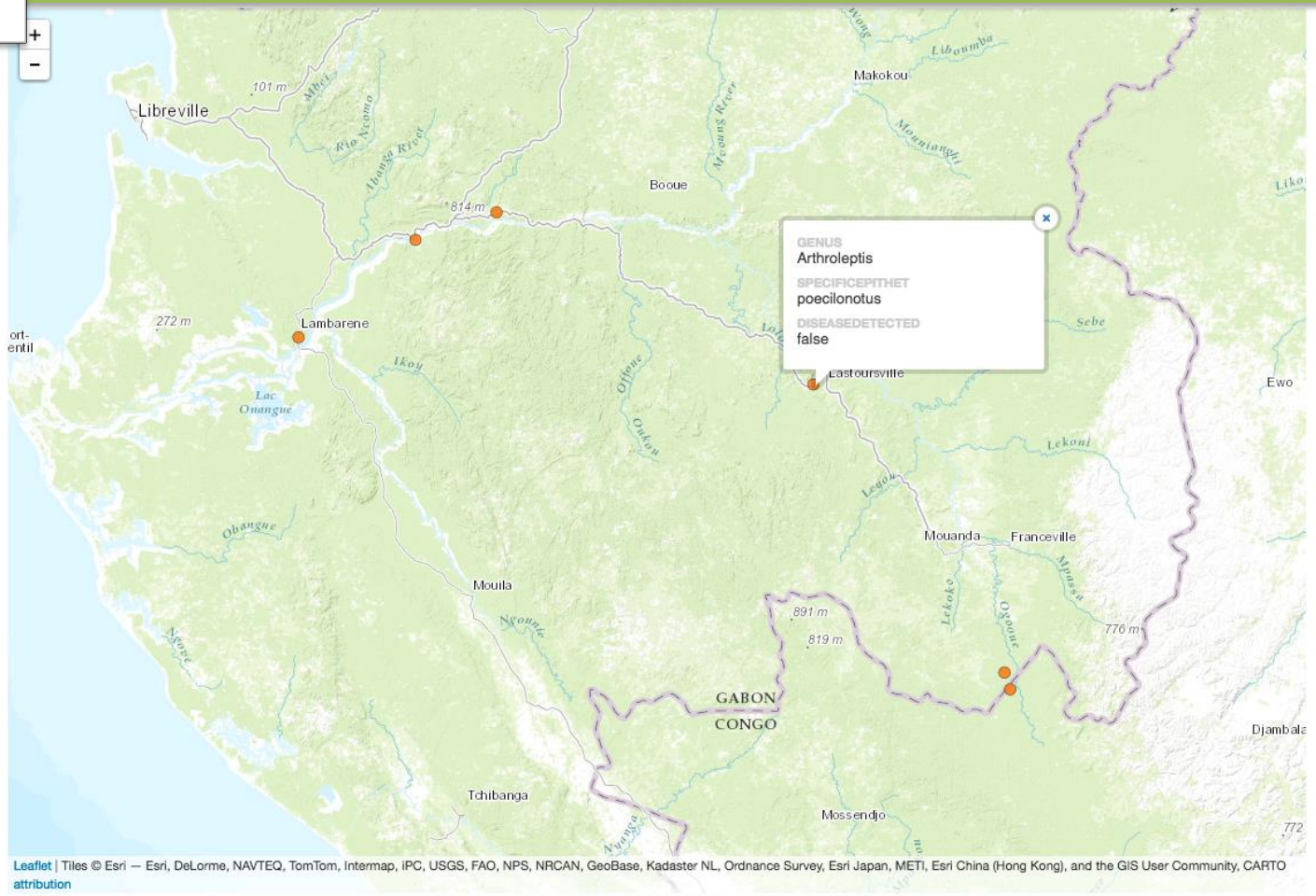
Show projects without data and locales

Showing 10 newest projects of about 43, ordered by Sort Options: sampling date

AmphibianDisease.org



Search by Taxa



Viewing data points of 'arthroleptis ' in bounds defined by [{lat: -40.44694705960048,lng: 67.236328125},{lat: 22.51255695405145,lng: -31.640625}]

Search & Visualize Records BETA

Taxa filter: Arthroleptis

Search In Projects | Search In Samples

Reset Map

SHOW FILTERS

Taxa Snapshots

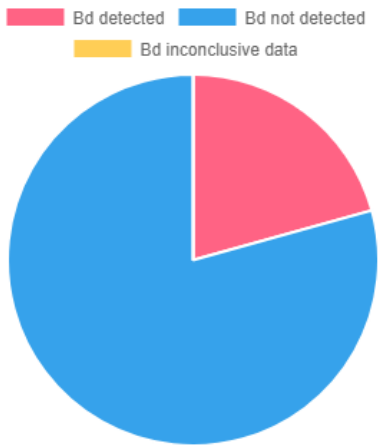
Taxon: *Anaxyrus boreas*

IUCN Status: Least Concern

Names: Western Toad

Sampled in the following countries:

- United States



Represented in **2** projects with **58** samples:

Sierra Nevada Retrospective Analysis

Introduced bullfrogs facilitate pathogen invasion in the western United States

Anaxyrus boreas on AmphibiaWeb

Taxon: *Salamandra salamandra*

IUCN Status: Least Concern

Sampled in the following countries:

- Switzerland

Represented in **2** projects with **446** samples:

Survey of Bd in Salamanders...

Bsal salamander survey

Salamandra salamandra on AmphibiaWeb

Project Pages

Widespread presence and high prevalence of Batrachochytrium dendrobatidis in Gabon

Project #4bc91fb90ff5575d5affec1724447bba

Project Basics

ARK identifier
ark:/21547/ANU2

Project pathogen
Batrachochytrium dendrobatidis

Project PI
David Blackburn

DOI

Project Contact
Greg Jongsma

Diagnostic Lab
Kerby Lab, University of South Dakota

Affiliation
University of Florida

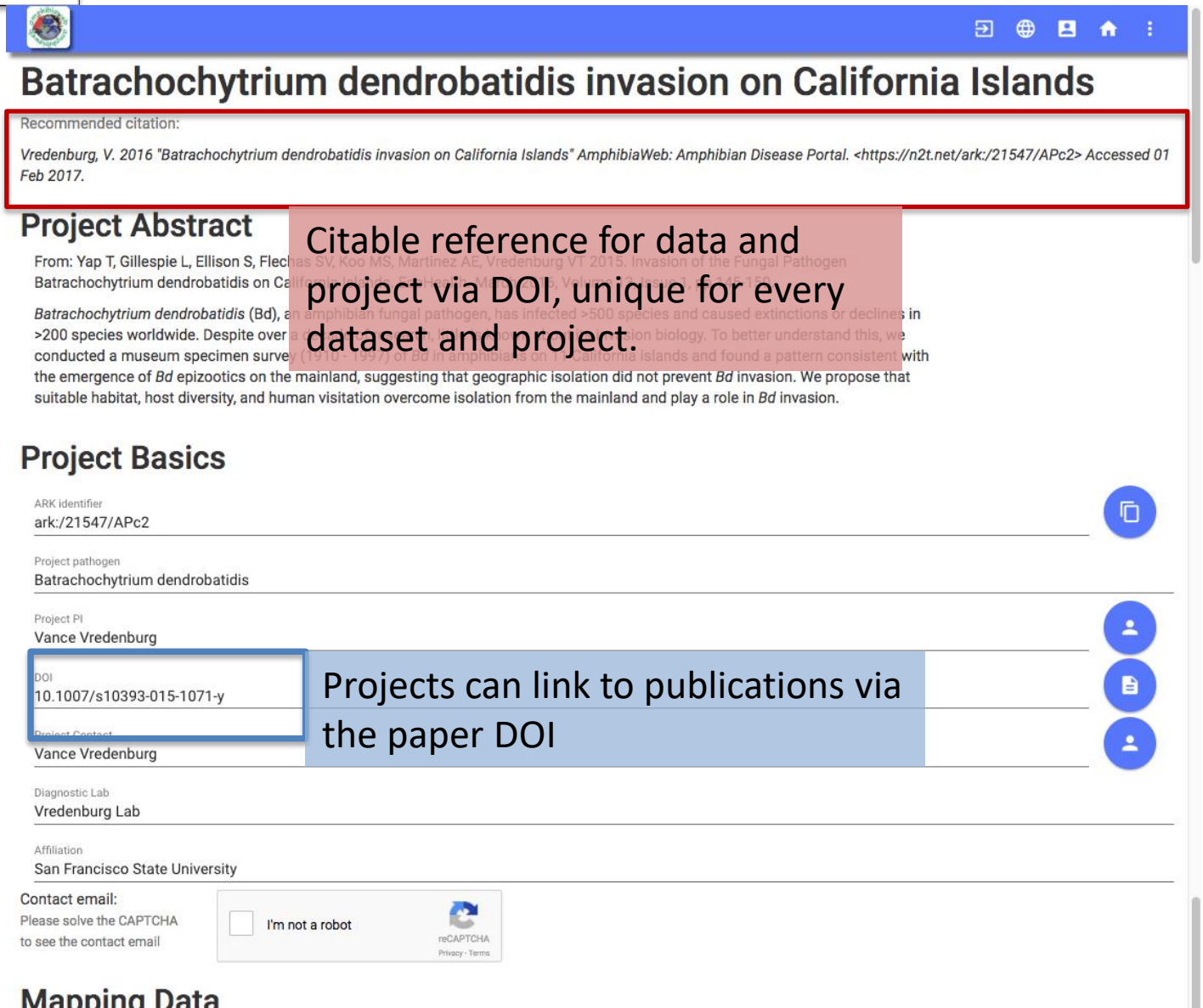
Contact Email
gregor.jongsma@gmail.com

Projects can be created and shared privately among collaborators.

Share data and use mapping resources.

When ready for publication, can make public and cite ARK identifier.

Project Pages



Batrachochytrium dendrobatidis invasion on California Islands

Recommended citation:

Vredenburg, V. 2016 "Batrachochytrium dendrobatidis invasion on California Islands" AmphibiaWeb: Amphibian Disease Portal. <https://n2t.net/ark:/21547/APc2> Accessed 01 Feb 2017.

Citable reference for data and project via DOI, unique for every dataset and project.

Project Abstract

From: Yap T, Gillespie L, Ellison S, Flec… Batrachochytrium dendrobatidis on Ca…

Batrachochytrium dendrobatidis (Bd), a… >200 species worldwide. Despite over … conducted a museum specimen surve… the emergence of *Bd* epizootics on the mainland, suggesting that geographic isolation did not prevent *Bd* invasion. We propose that suitable habitat, host diversity, and human visitation overcome isolation from the mainland and play a role in *Bd* invasion.

Project Basics

ARK identifier
ark:/21547/APc2

Project pathogen
Batrachochytrium dendrobatidis

Project PI
Vance Vredenburg

DOI
10.1007/s10393-015-1071-y

Projects can link to publications via the paper DOI

Project Contact
Vance Vredenburg

Diagnostic Lab
Vredenburg Lab

Affiliation
San Francisco State University

Contact email:
Please solve the CAPTCHA to see the contact email

I'm not a robot
reCAPTCHA
Privacy - Terms

Mapping Data

Data Validation

Step	Relative Speed	Action	Possible Errors
Data Parsing	Fast	Does a quick check for most important attributes of datafile before slower steps	Missing columns, no rows, bad data types for obvious columns from a random row. An error summary will be provided in a hanging alert from the top of the screen.
Data Validation	Moderate	Does a full row-by-row data validatation with BiSciCol.org	Many. A full table of errors will be provided if any are found, as well as a short summary hanging from the top of the screen
Taxa Validation	Moderate-Slow	For each distinct species, validates against our API.	See our API documentation for all possible errors. Taxa replacements will generate a (non-fatal) notice above the species list in the "Project Data Summary" later in the page.
Data Sync	Slow	Formats your data for CartoDB and uploads it to CartoDB. Scales roughly linearly with rows, and largely dependent on the connection from our servers to CartoDB.	Upload failure, if CartoDB rejects the data for any reason.

Mapping Data in a Project

Mapping Data

Data were taken from April 2015 — May 2015

Data were taken in April and May

Data were sampled in the year 2015

The effective project center is at (-0.955859, 11.772446) with a sample radius of 254371m and a resulting locality **Gabon**

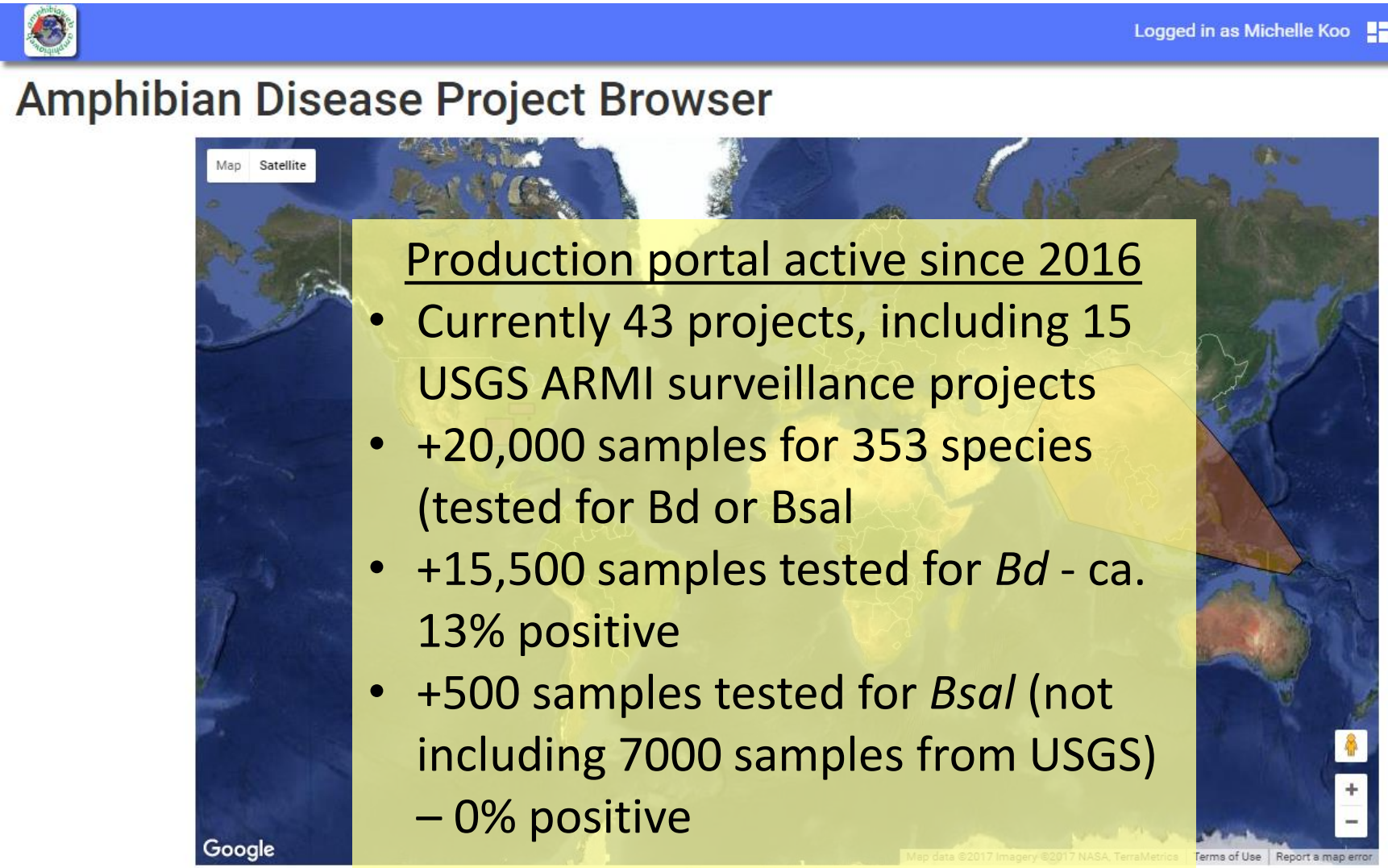
The dataset contains 85 positive samples (18%), 378 negative samples (82%), and 0 inconclusive samples (0%)

Download Newest Datafile | Download Species List

Toggle map markers

Positive | Negative | Inconclusive

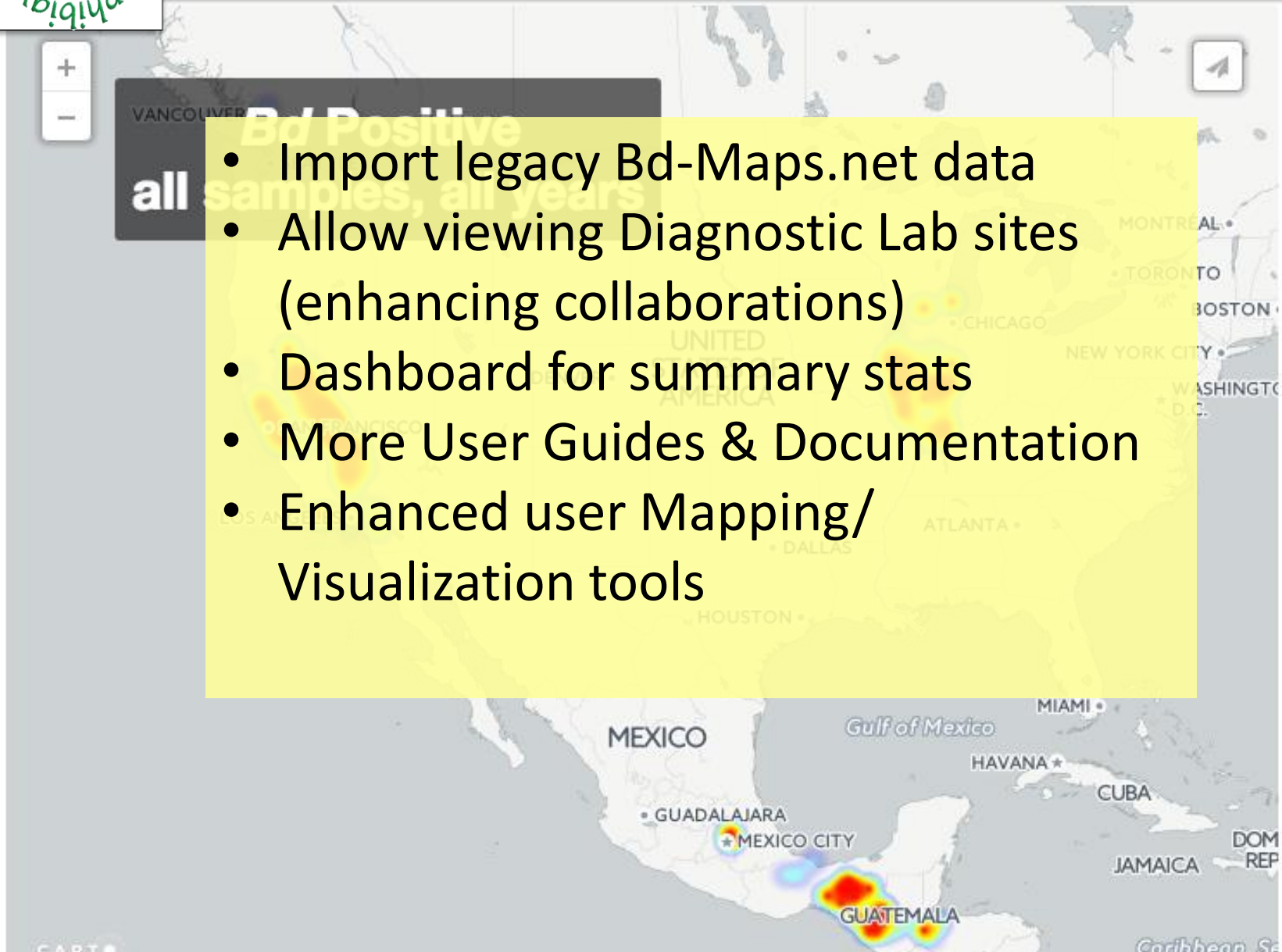
Data by the numbers



Production portal active since 2016

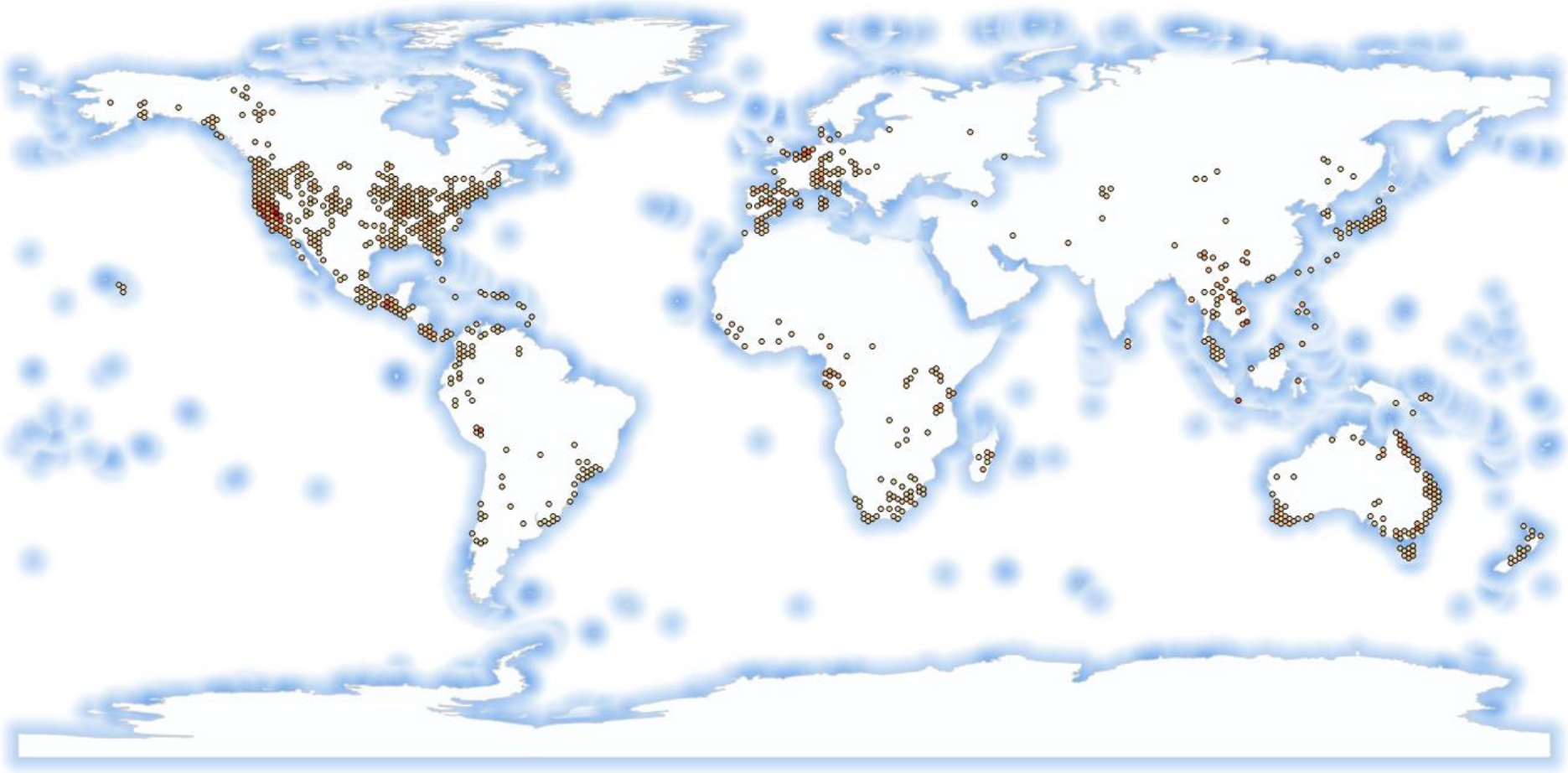
- Currently 43 projects, including 15 USGS ARMI surveillance projects
- +20,000 samples for 353 species (tested for Bd or Bsal
- +15,500 samples tested for *Bd* - ca. 13% positive
- +500 samples tested for *Bsal* (not including 7000 samples from USGS) – 0% positive

Imminent Work

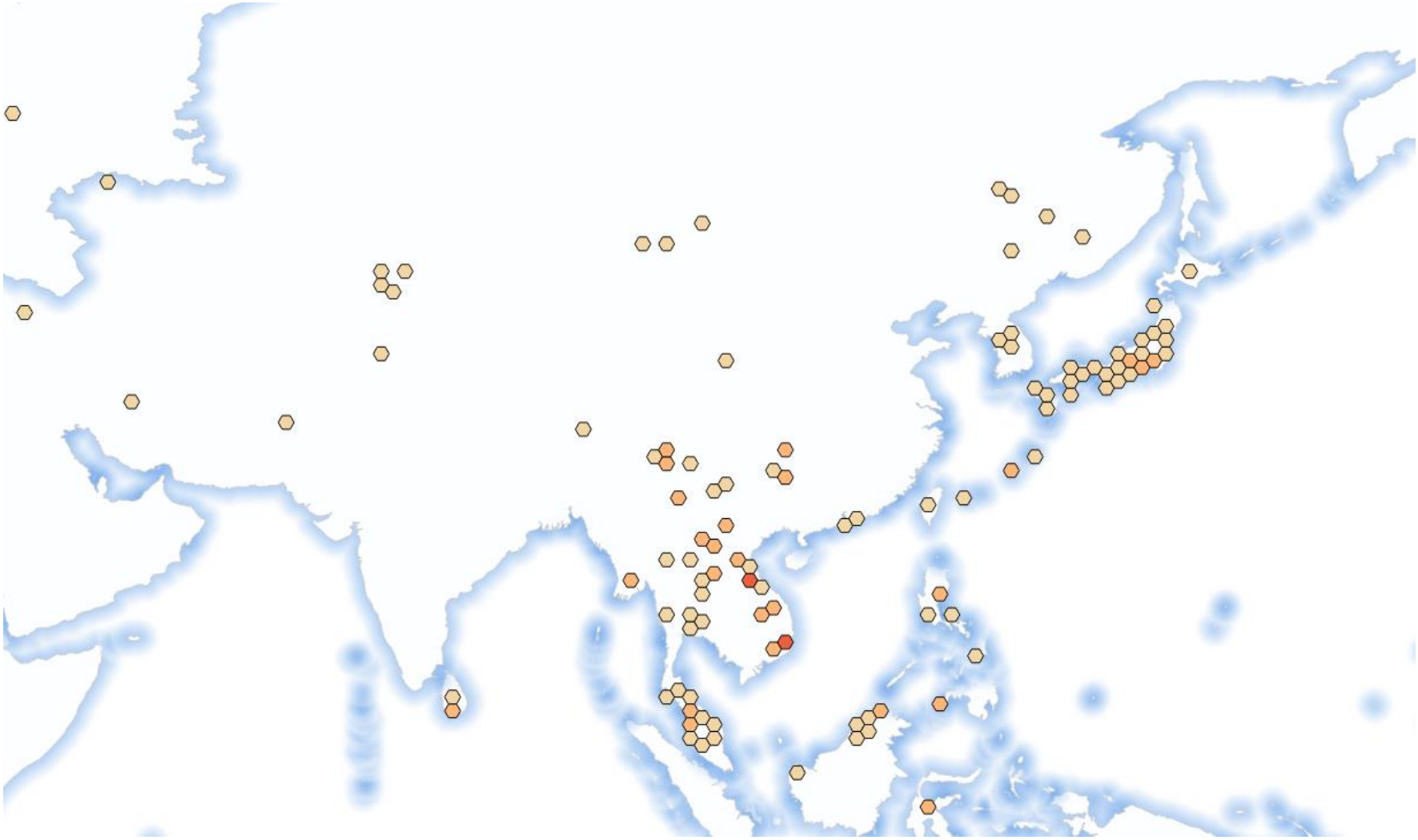


- Import legacy Bd-Maps.net data
- Allow viewing Diagnostic Lab sites (enhancing collaborations)
- Dashboard for summary stats
- More User Guides & Documentation
- Enhanced user Mapping/ Visualization tools

28,000+ Chytrid testing sites aggregated in 1- degree bins

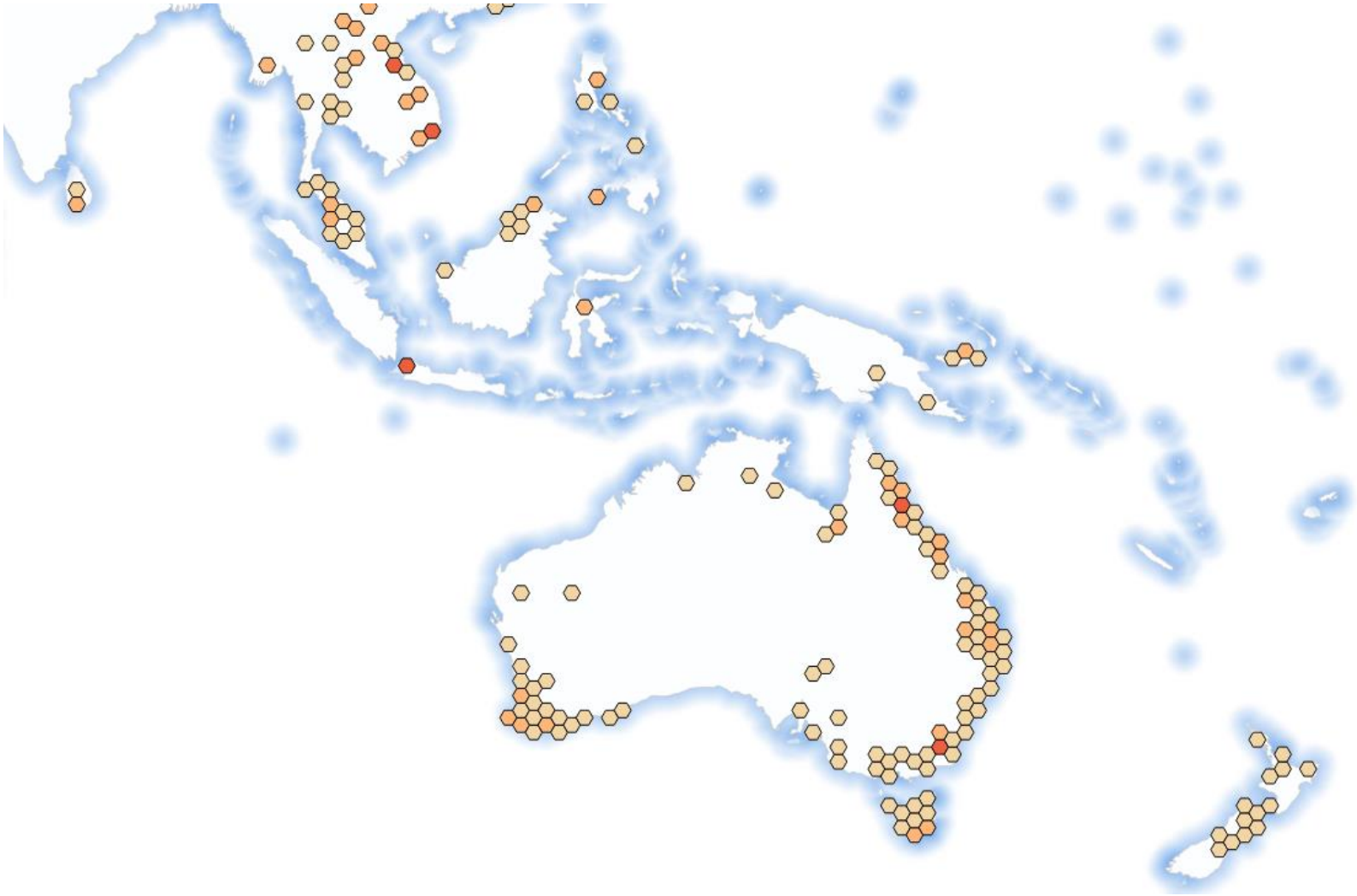


28,000+ Chytrid testing sites aggregated in 1- degree bins



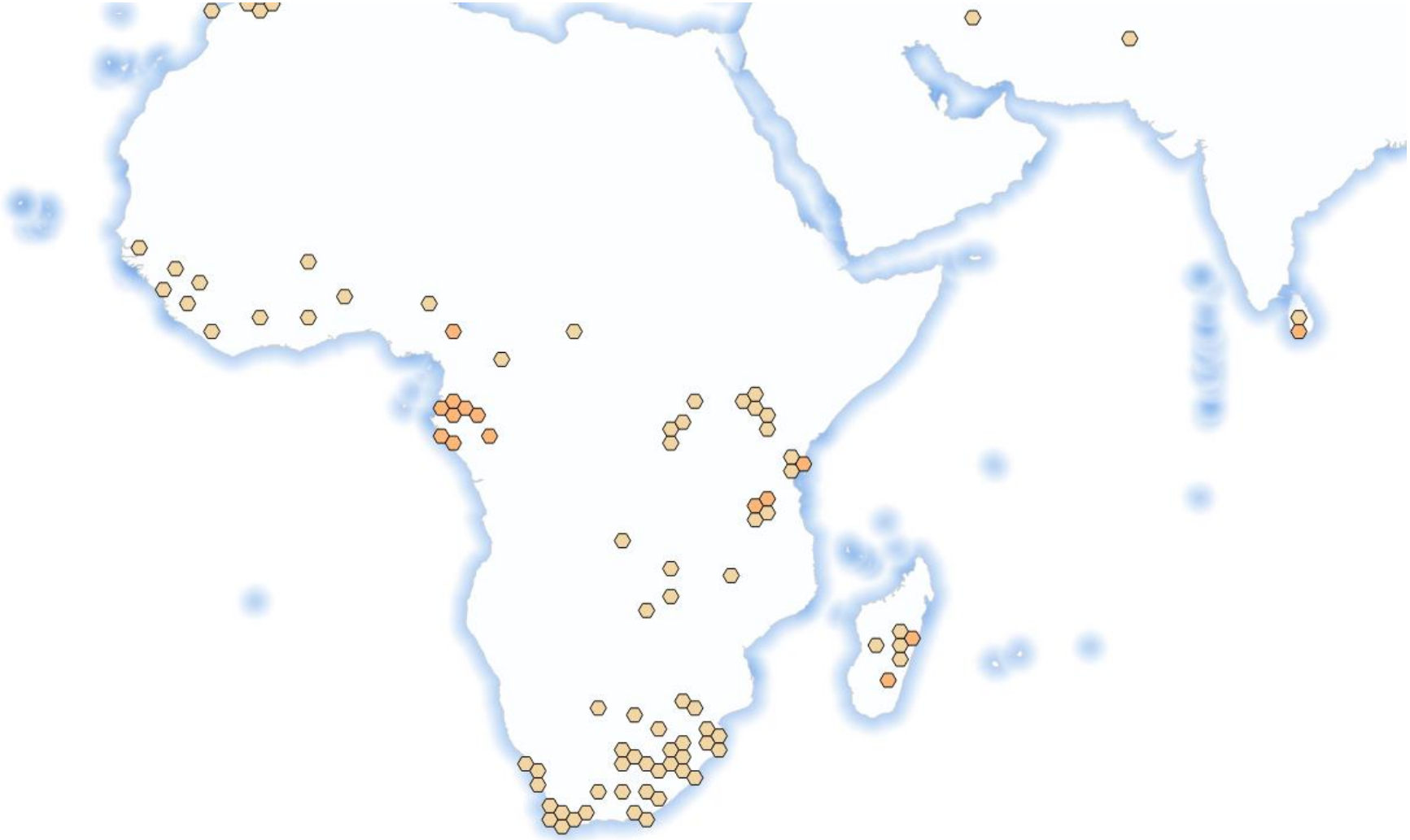
2018 AmphibianDisease.org

28,000+ Chytrid testing sites aggregated in 1- degree bins



2018 AmphibianDisease.org

28,000+ Chytrid testing sites aggregated in 1- degree bins



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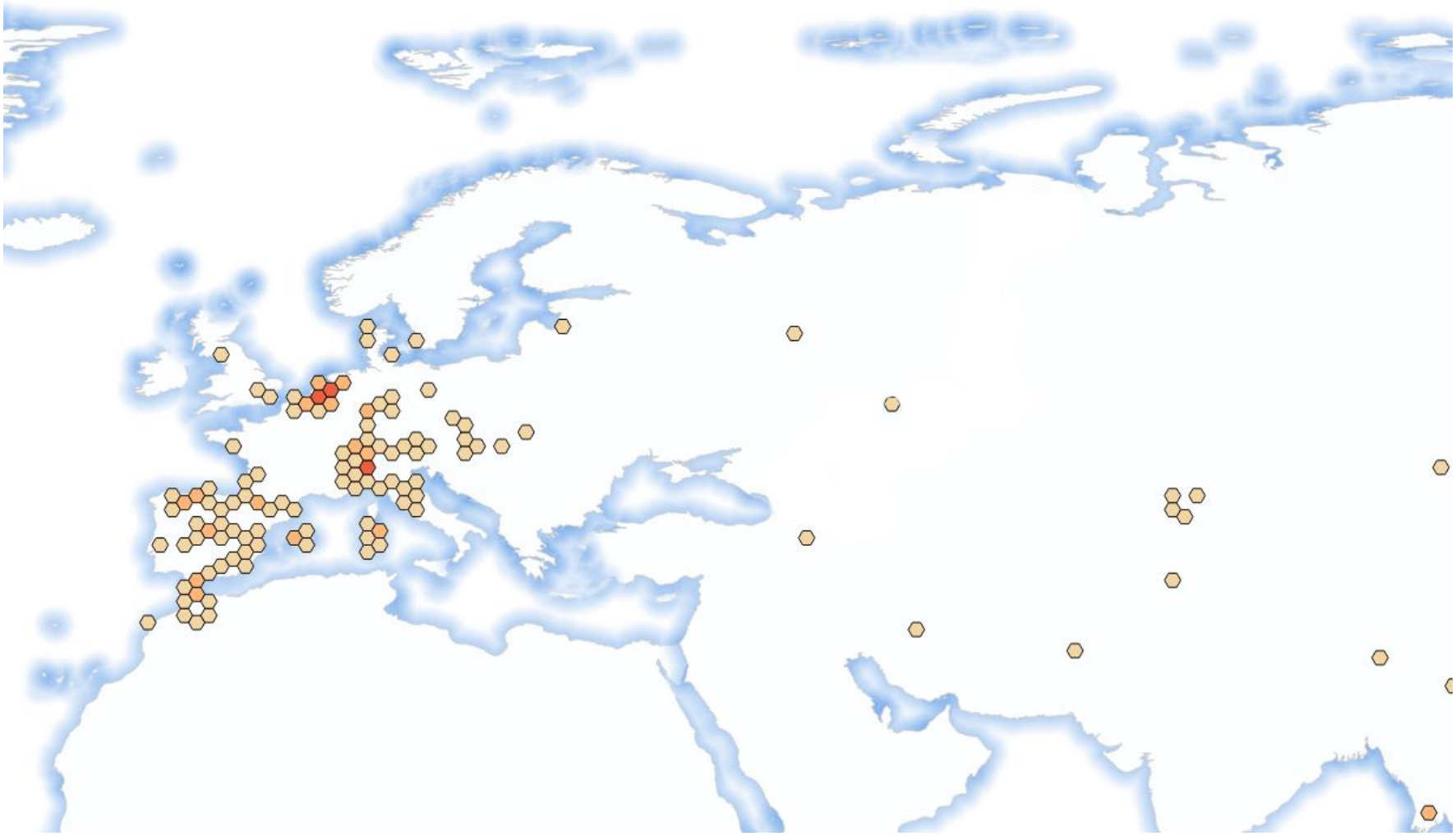

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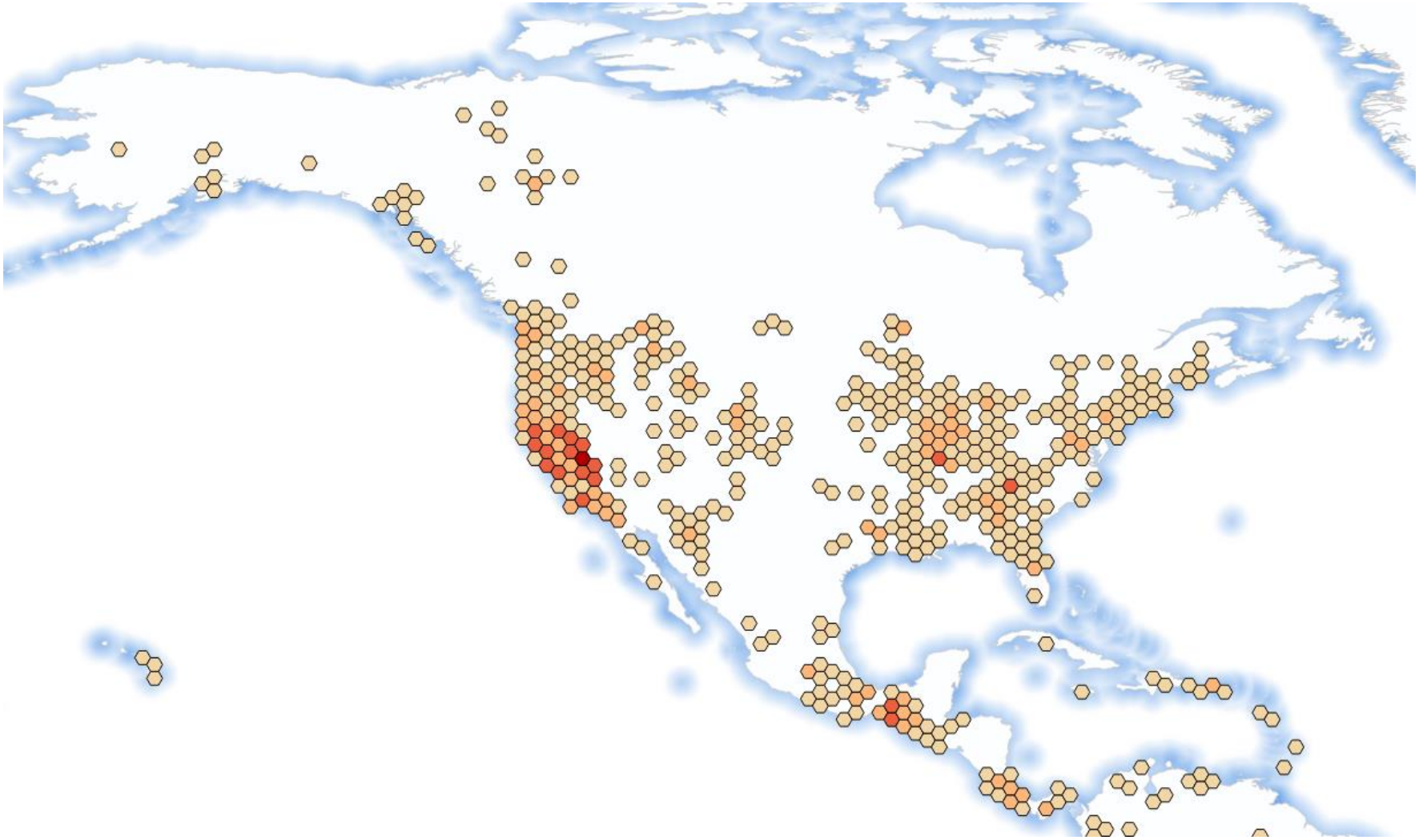
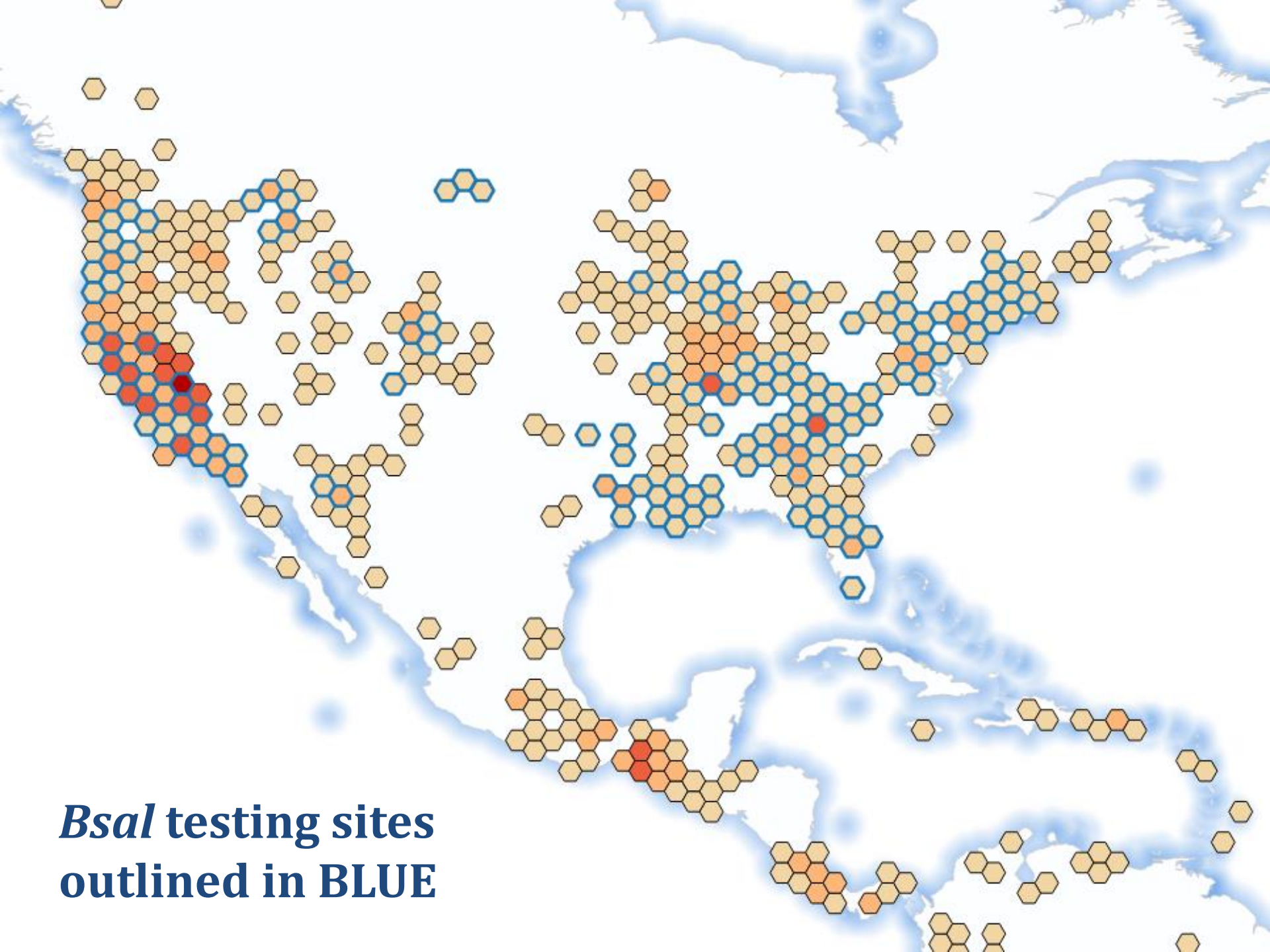
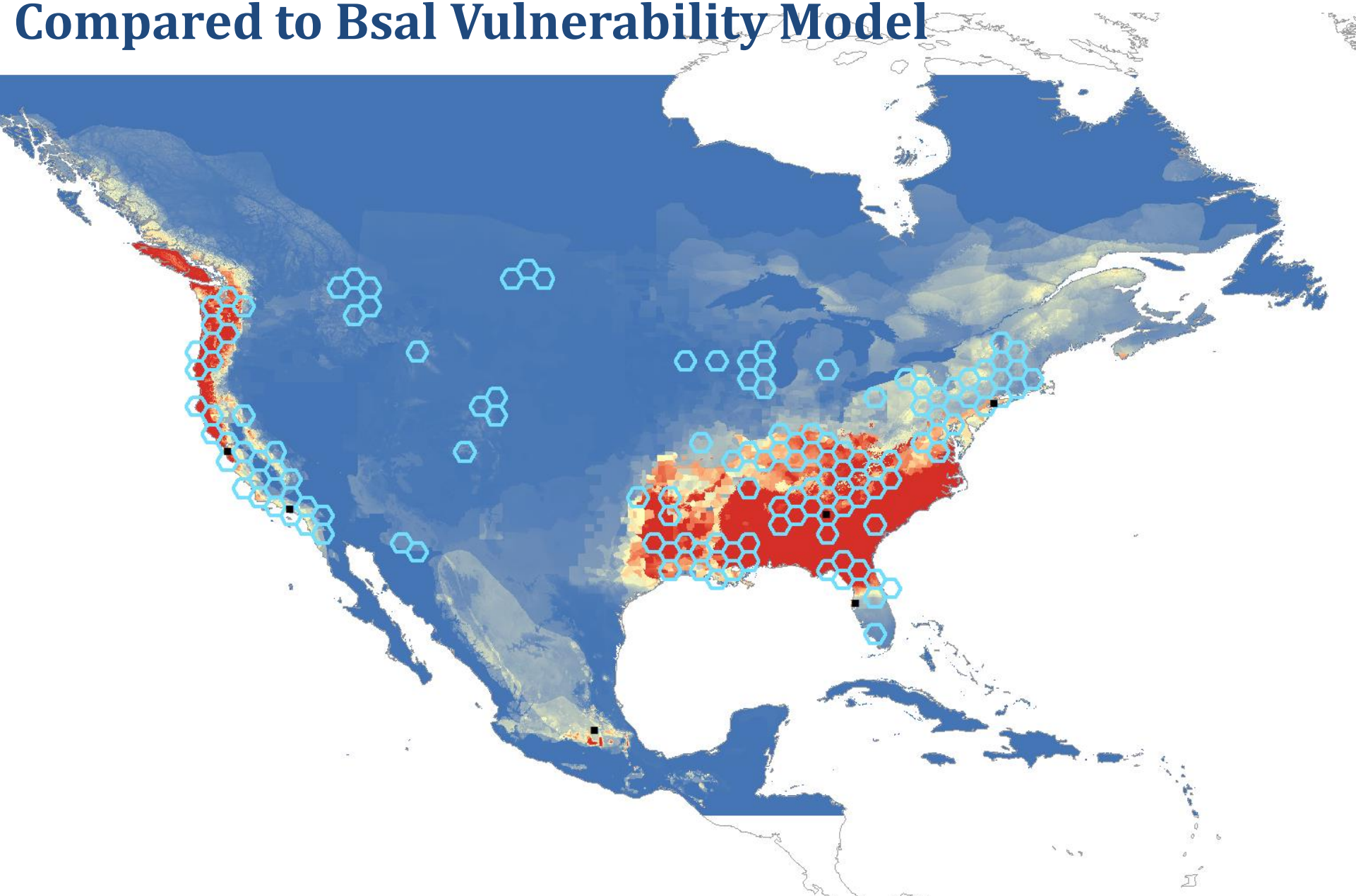


2018 AmphibianDisease.org

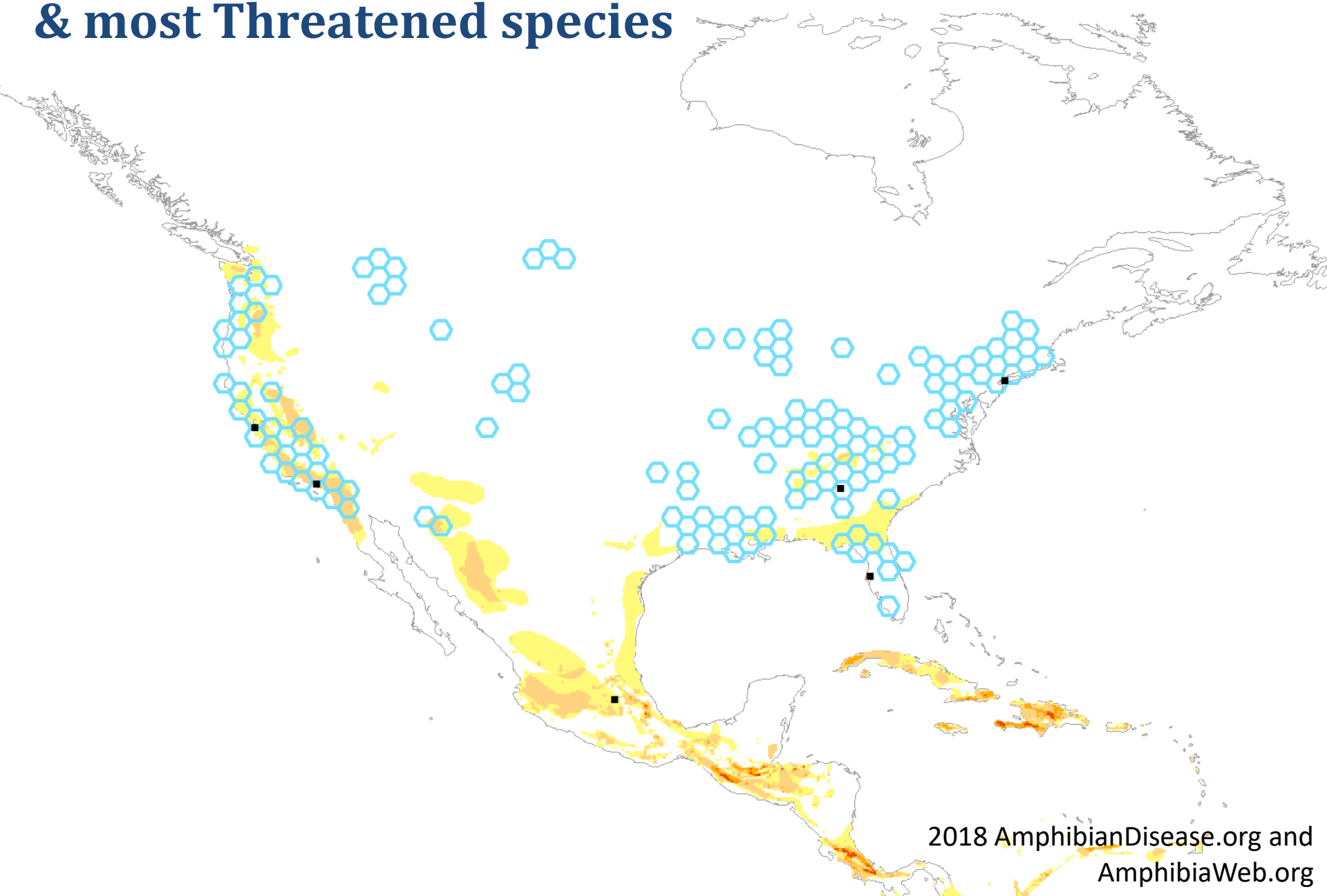

Bsal testing sites
outlined in BLUE

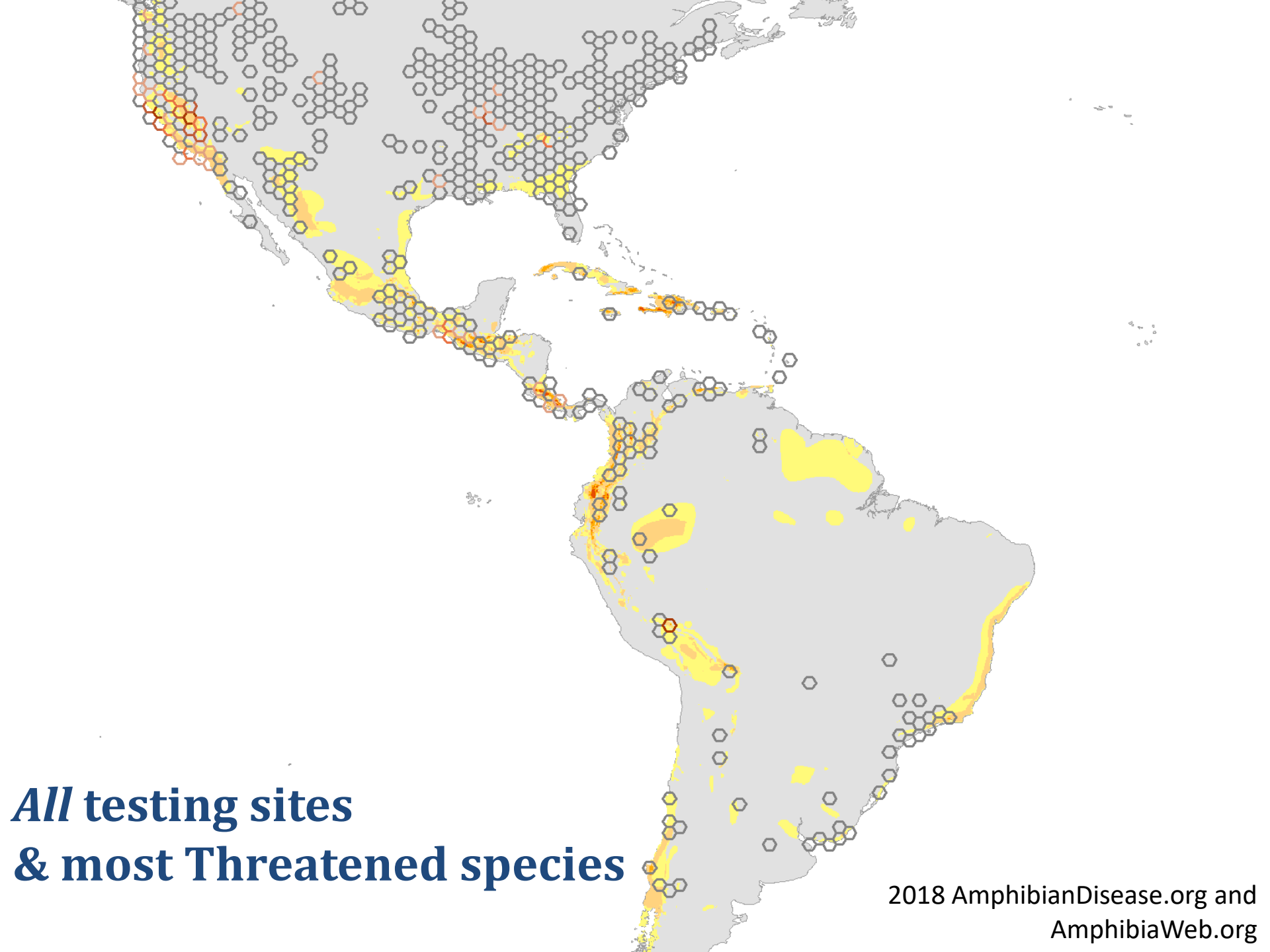
Bsal testing sites in BLUE
Compared to Bsal Vulnerability Model



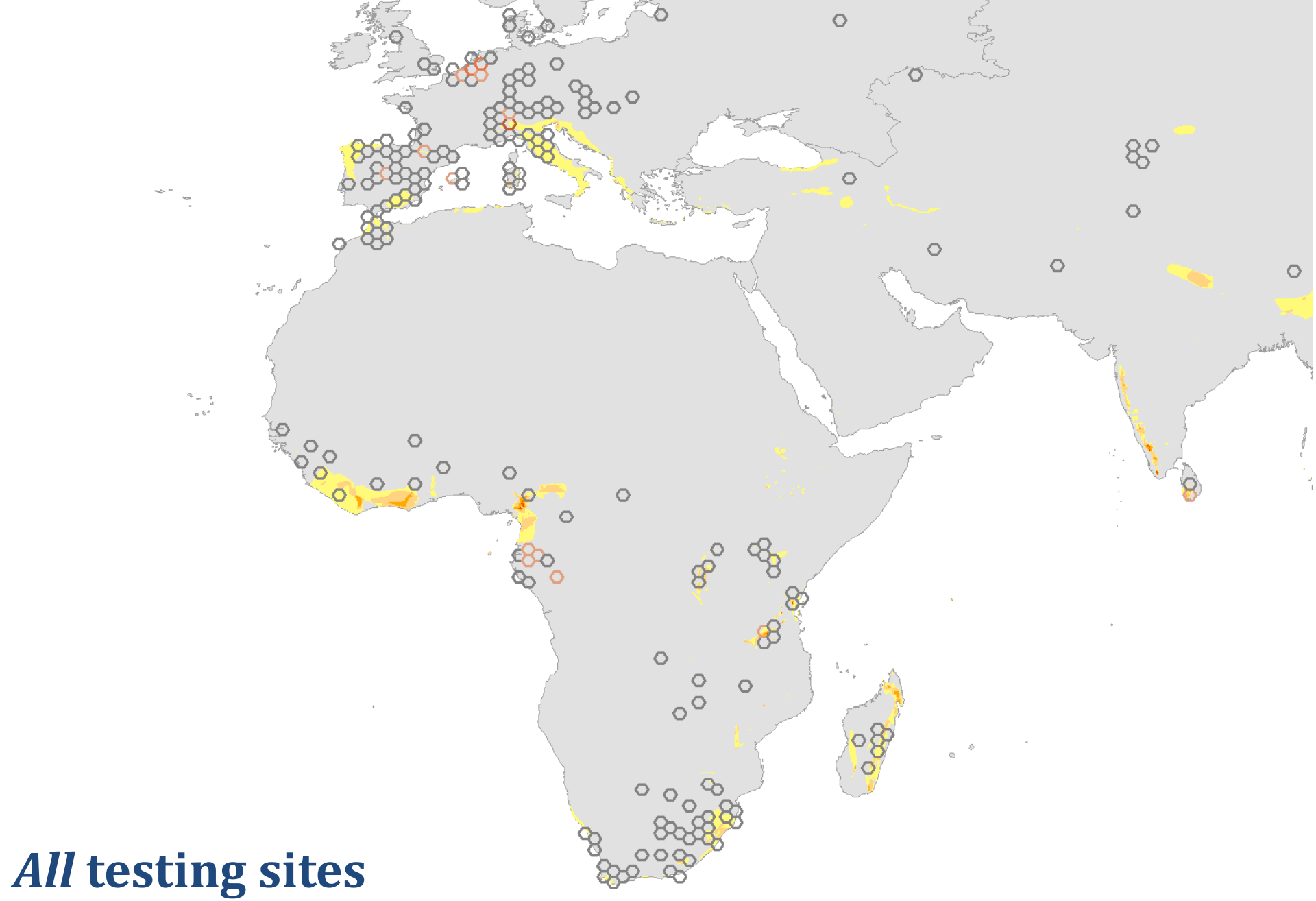
Yap, Koo, Ambrose, Wake, and Vredenburg 2015 *Science*

Bsal testing sites in BLUE & most Threatened species

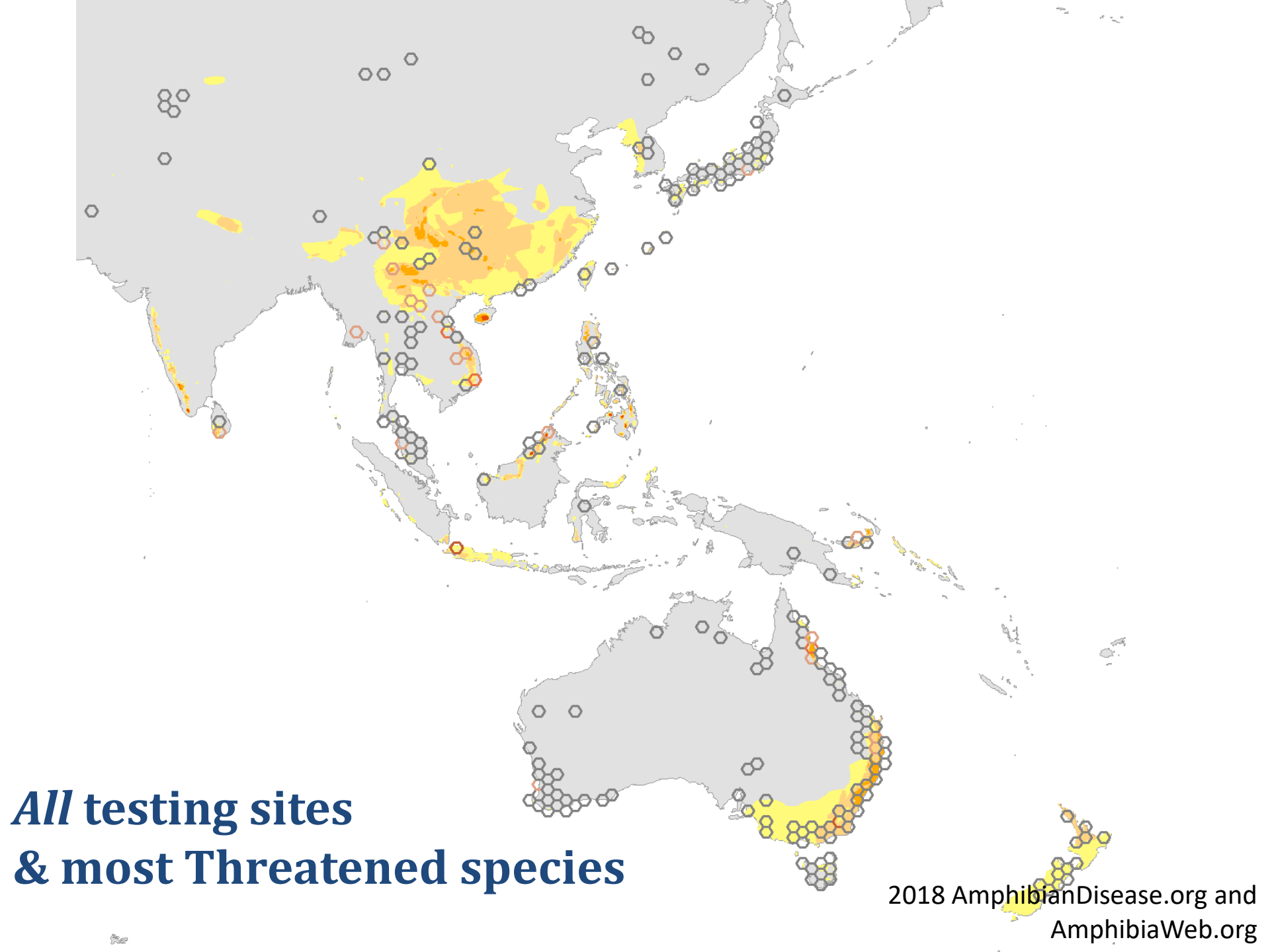




All testing sites
& most Threatened species



All testing sites & most Threatened species



All testing sites
& most Threatened species

Preliminary Messages

- *Bsal* testing targeted the most vulnerable places on US but we need to establish baseline in Asia and elsewhere
- Bd sampling is spotty globally
- Bd testing may miss critical areas
- Need to address: Ongoing work in genomics to differentiate strains?! eDNA? Monitoring?
- Need to improve all our models!

Come Visit, Contribute, Collaborate