AFTER DIGITIZATION...

TAXONOMY?

GBIF: Over 400 million occurrence data
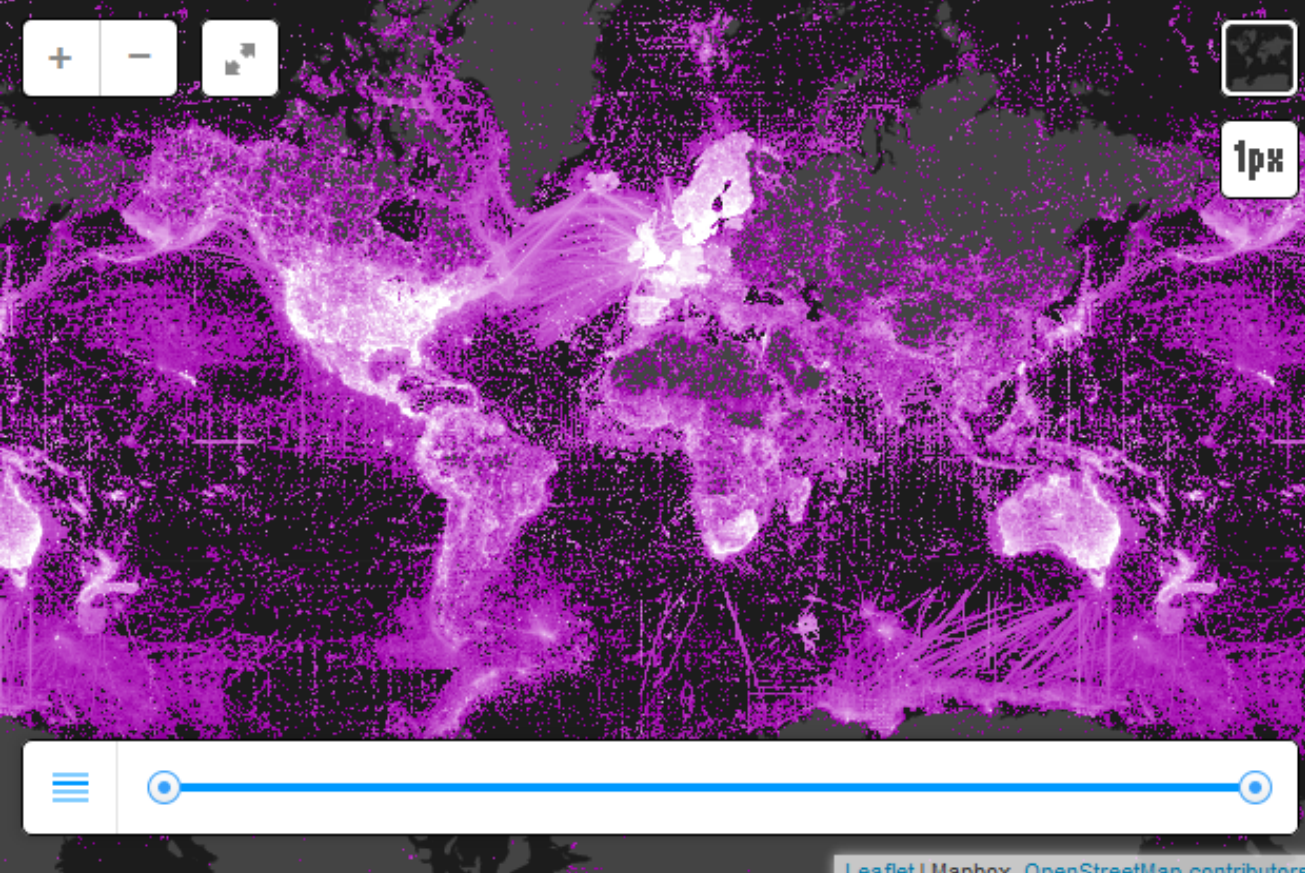
GBIF: Over 350 million georeferenced occurrence data
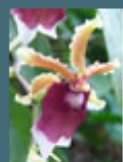
Symbiota
Promoting Bio-Collaboration

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Password:

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Active Symbiota Projects

The following biodiversity projects use the Symbiota Virtual Biota software package to establish biodiversity portals with specific regional and/or taxonomic scopes. Each portal represents the community of collaborating researchers that manage the core scientific data. If you are interested in becoming a data contributor for an already established data portal, contact the portal administrator for more information on gaining access to their data editing tools. For more information on what is involved in being a data provider, read the Specimen Integration page.

Quick Index

- SEINet
- Intermountain Regional Herbarium Network (IRHN)
- Consortium of North American Bryophyte Herbaria (CNABH)
- Consortium of North American Lichen Herbaria (CNALH)
- Mycology Collections Data Portal (MycoPortal)
- Consortium of Northeastern Herbaria Portal (CNH)
- Madrean Archipelago Biodiversity Assessment Project (MABA)
- Cooperative Taxonomic Resource for American Myrtaceae (CoTRAM)
- Herbario Virtual Austral Americano (HVAA)

SEINet - Southwest Environmental Information Network

SEINet is a virtual flora that covers the southwestern region of North America with a particular interest in the desert regions.

- http://swbiodiversity.org/seinet/index.php
- Active Projects
- Data Providers
- Data digitization funding
  - Completion and Coordination of Databases of Arizona Vascular Plants at ASU, ARIZ, and ASC BRC-0237418
  - Collaborative Research: Expanding SEINet HR-0847966

Is this taxonomy real?
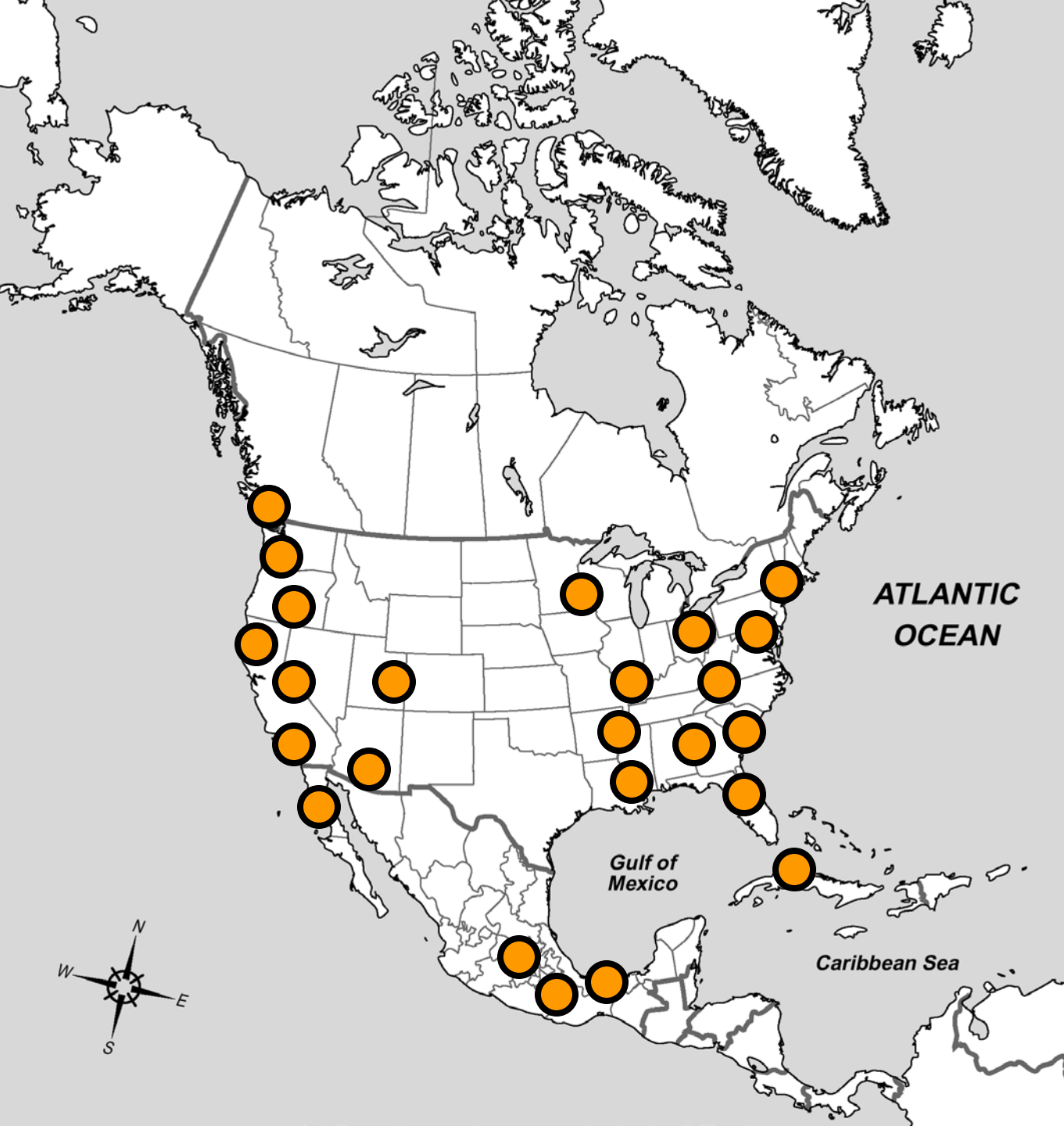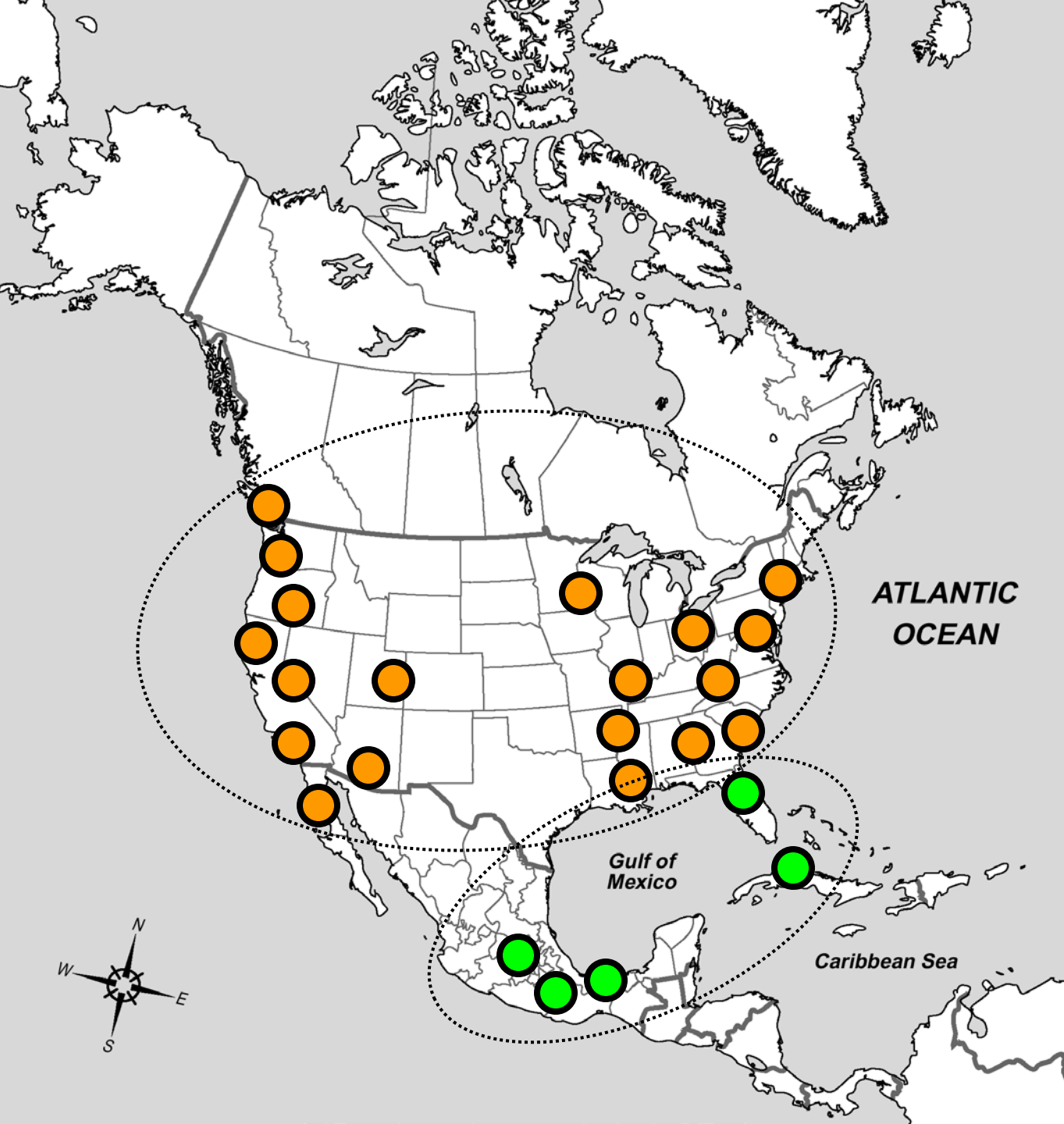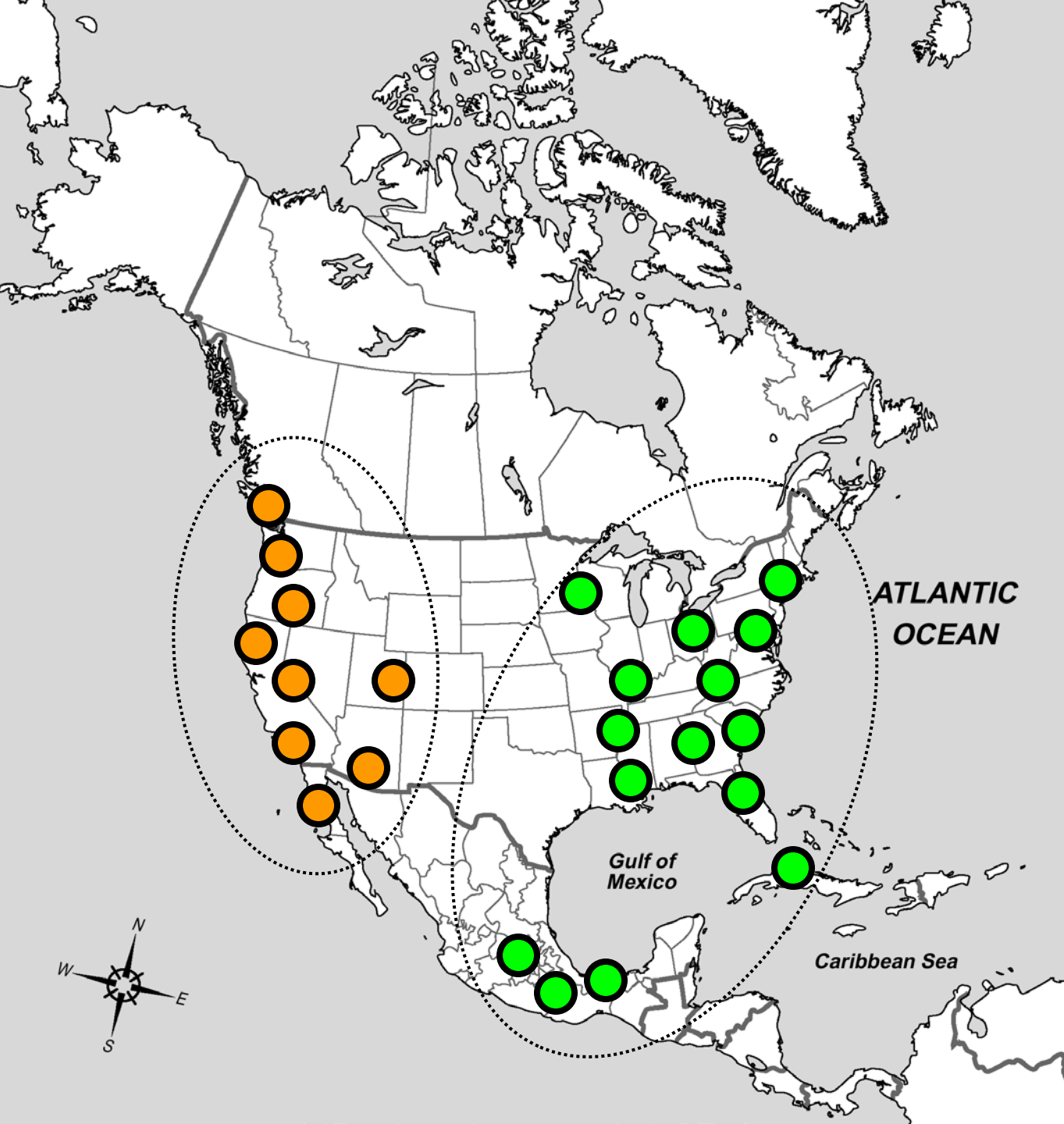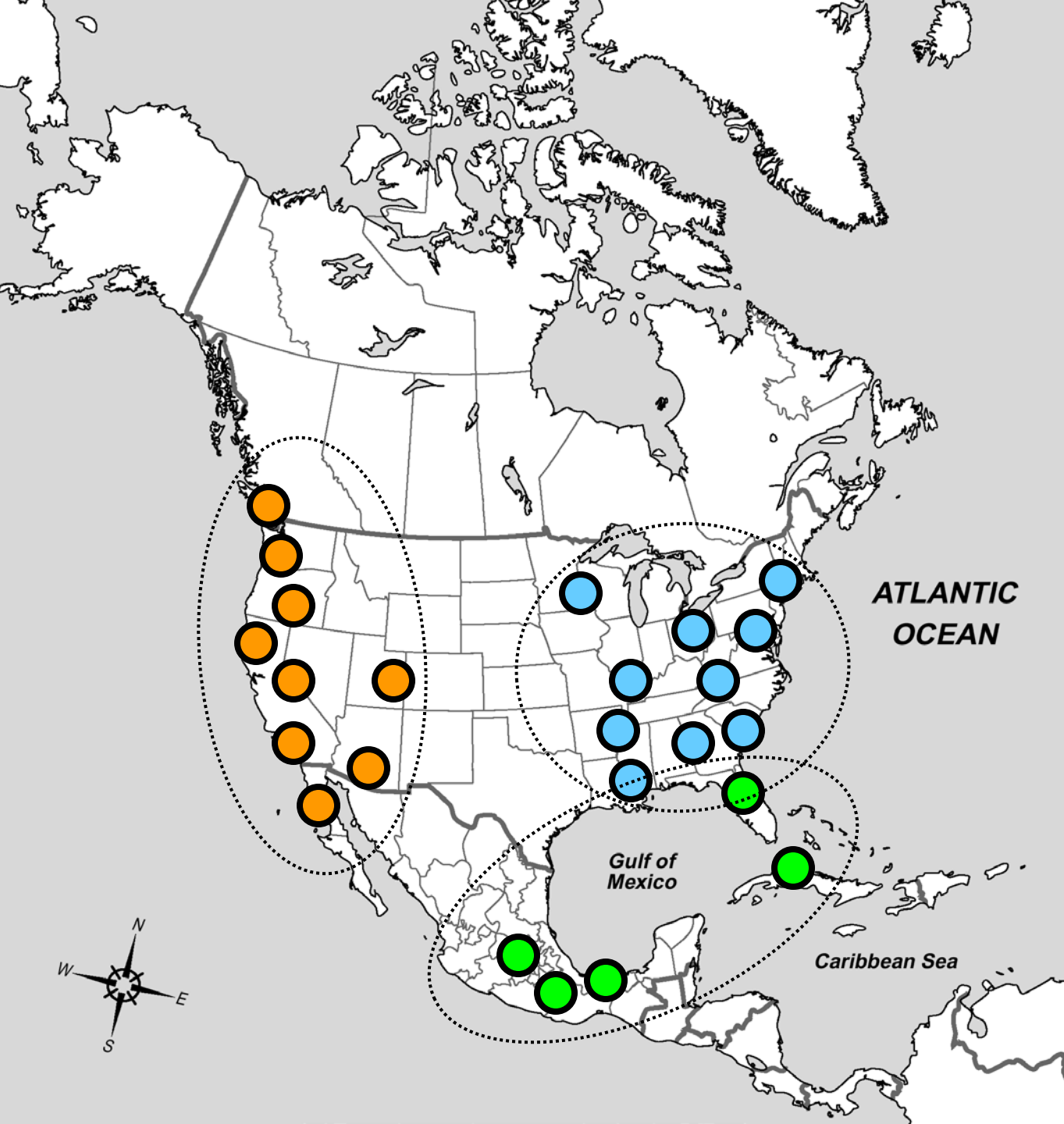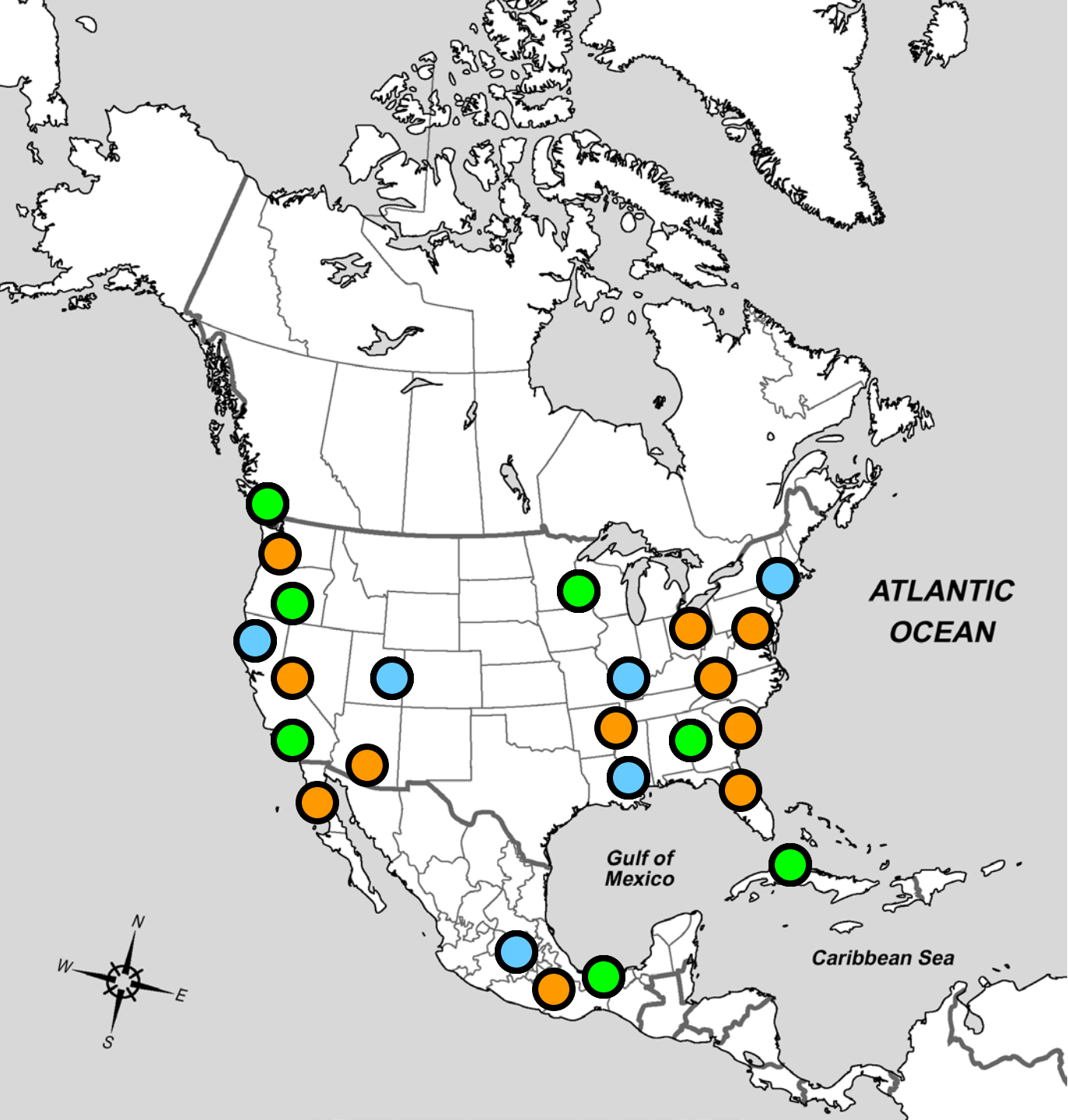
Problems:

1. Changes in nomenclature (genus names, epithets)

2. Plain wrong identifications

3. Changes in species concepts (splitting, lumping)

Problems:

1. Changes in nomenclature (genus names, epithets)

2. Plain wrong identifications

3. Changes in species concepts (splitting, lumping)

Pseudocyphellaria crocata

GBIF: Occurrence data
Pseudocyphellaria crocata (global)

GBIF: Occurrence data
Pseudocyphellaria crocata
(North America)

Pseudocyphellaria_spec_EU558719_Argentina_Stenroos_5319_ITS
Pseudocyphellaria_spec_EU558718_Argentina_Stenroos_5295_ITS
Pseudocyphellaria_granulata_AF350313_NewZealand_Thomas_1215_ITS
Pseudocyphellaria_faveolata_AF350311_NewZealand_Thomas_994_ITS
Pseudocyphellaria_pilosella_EU558740_Argentina_Stenroos_5283_ITS
Pseudocyphellaria_coriifolia_EU558708_Argentina_Stenroos_5264_ITS
Pseudocyphellaria_coriifolia_EU558707_Argentina_Stenroos_5563_ITS
Pseudocyphellaria_coriifolia_EU558709_Argentina_Stenroos_5477_ITS
Pseudocyphellaria_coriifolia_EU558706_Argentina_Stenroos_5476_ITS

Pseudocyphellaria_aff_crocata_1_EU558701_Argentina_Stenroos_5474_ITS
Pseudocyphellaria_aff_crocata_1_AJ888204_Chile_Galloway_PC11_ITS
Pseudocyphellaria_aff_crocata_1_AF401980_USAWest_McCune_25753A_ITS
Pseudocyphellaria_aff_crocata_1_AF401981_USAWest_McCune_23490_ITS
Pseudocyphellaria_aff_crocata_1_AF401979_USAWest_McCune_25753B_ITS
Pseudocyphellaria_aff_crocata_1_DNA7840_MON924_CostaRica_Luecking_34807_ITS
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Pseudocyphellaria_aff_crocata_1_DNA7830_MON914_CostaRica_Scharnagl_KS02_ITS
Pseudocyphellaria_aff_crocata_1_DNA7280_MON741_CostaRica_Moncada_5665_ITS
Pseudocyphellaria_aff_crocata_1_AF401978_USAWest_McCune_25753C_ITS
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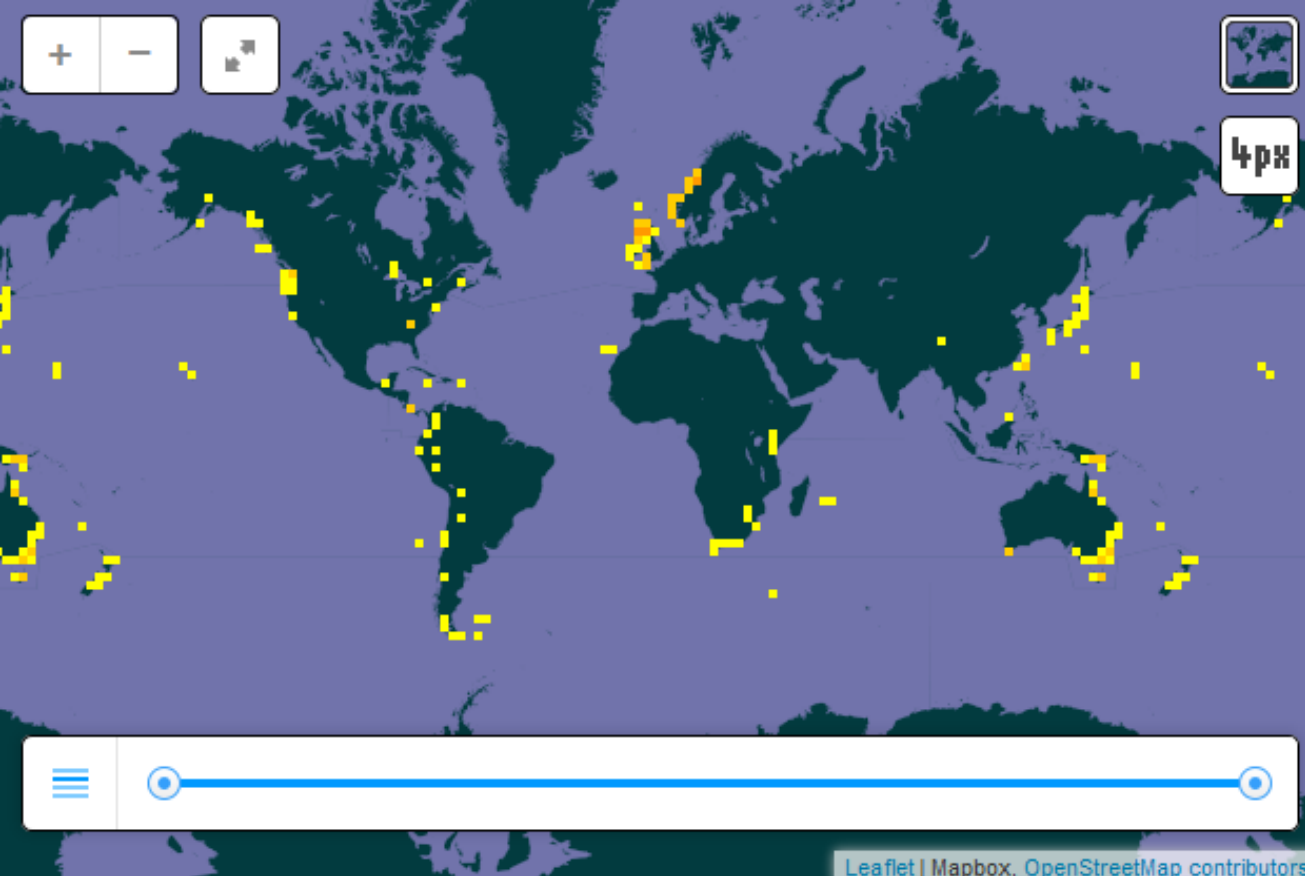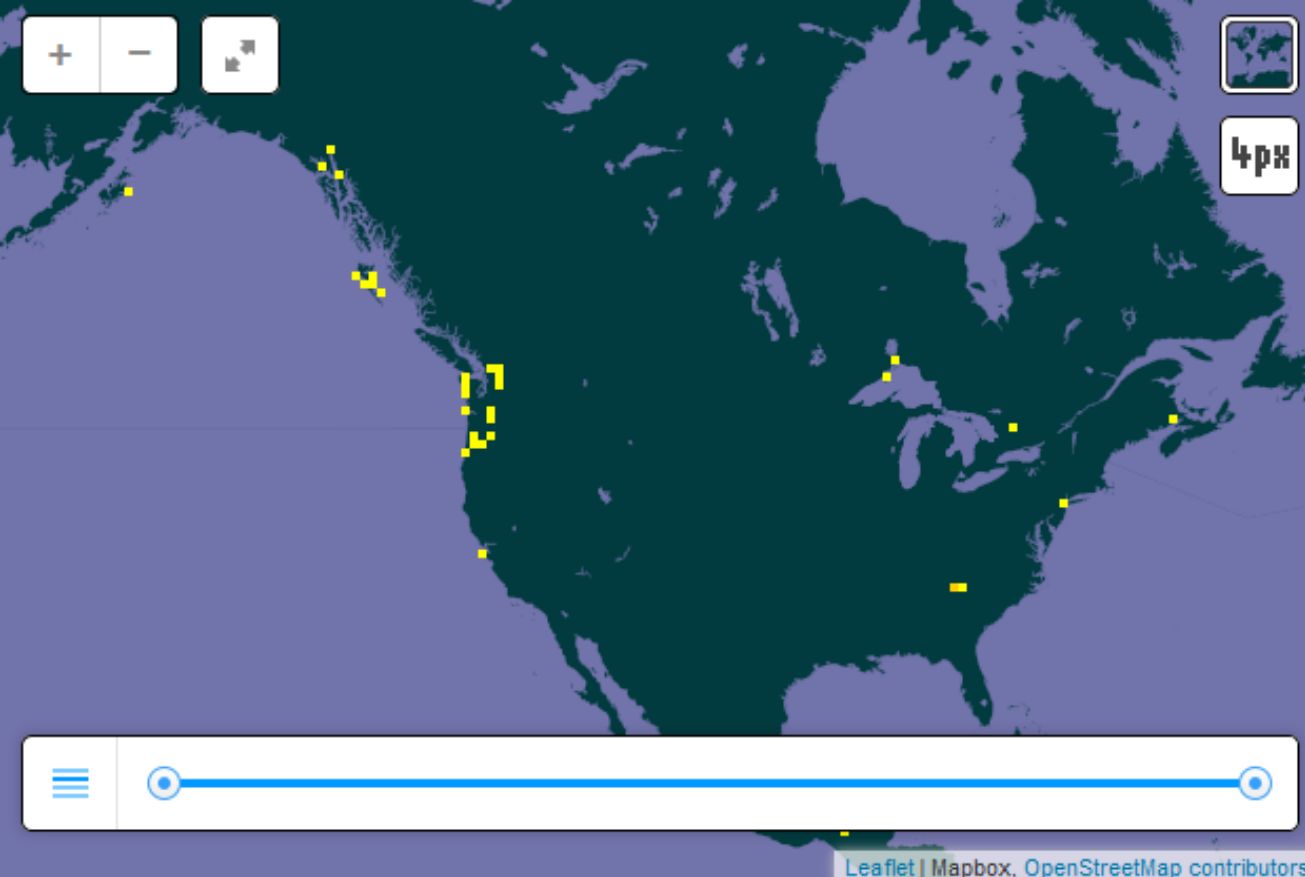Pseudocyphellaria_aff_crocata_1_AJ888205_Chile_Galloway_PC12_ITS

North America 1 (undescribed)

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Pseudocyphellaria_lechleri_AF261132_Argentina_Stenroos_5514_ITS
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Pseudocyphellaria_neglecta_AJ437687_NewZealand_Galloway_PN3_ITS
Pseudocyphellaria_neglecta_AJ437688_NewZealand_Galloway_PN4_ITS
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North America 2 (undescribed)

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crocata s.str.

Pseudocyphellaria_crocata_sstr_EU558700_Thailand_Watthana_090127_ITS
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Pseudocyphellaria_sandwicensis_2_DNA8076_MON1207_HawaiiMaui_Moncada_6944_ITS
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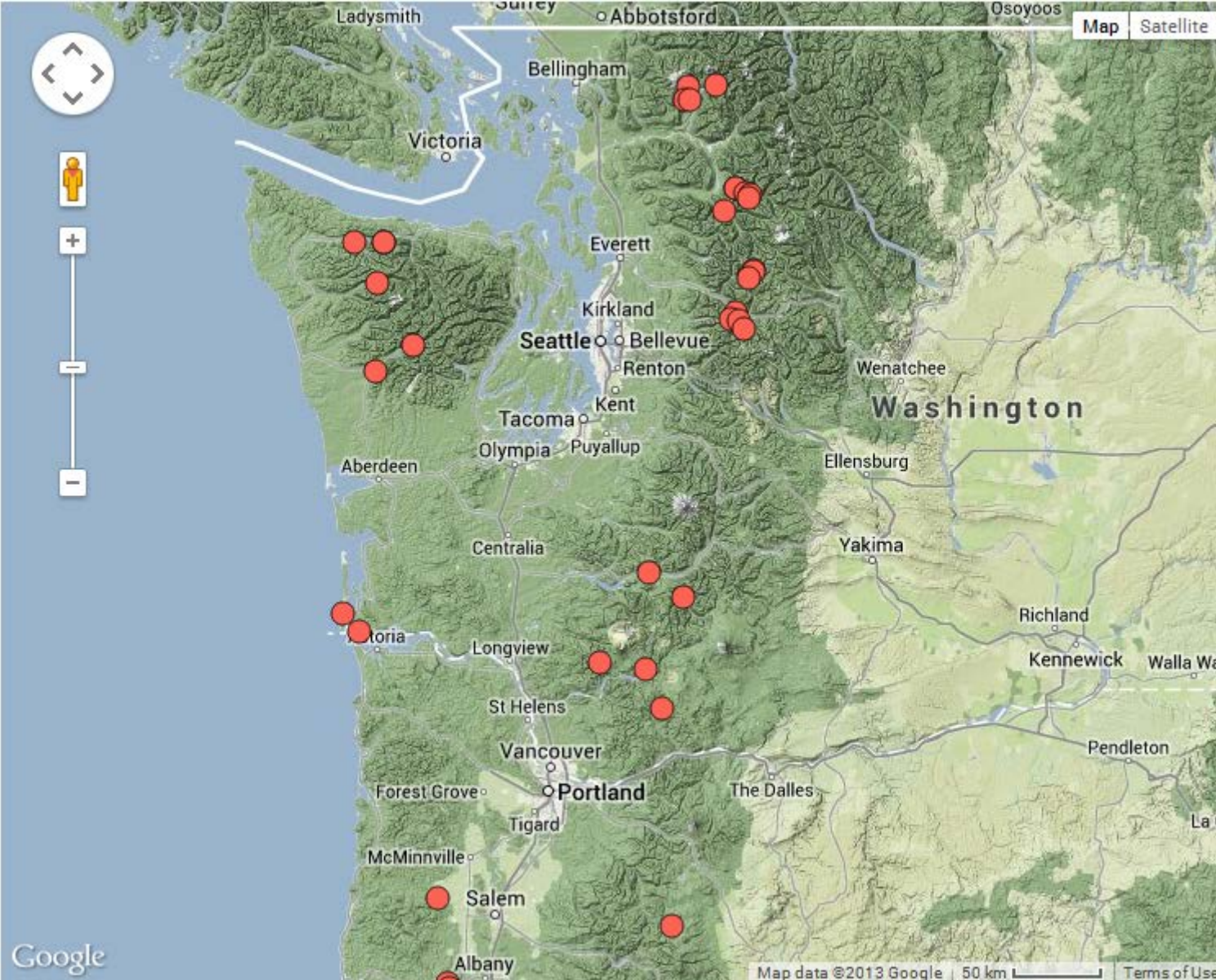**North America 2 (*hawaiiensis*)**

0.03

North America

SYMBIOTA: Occurrence data
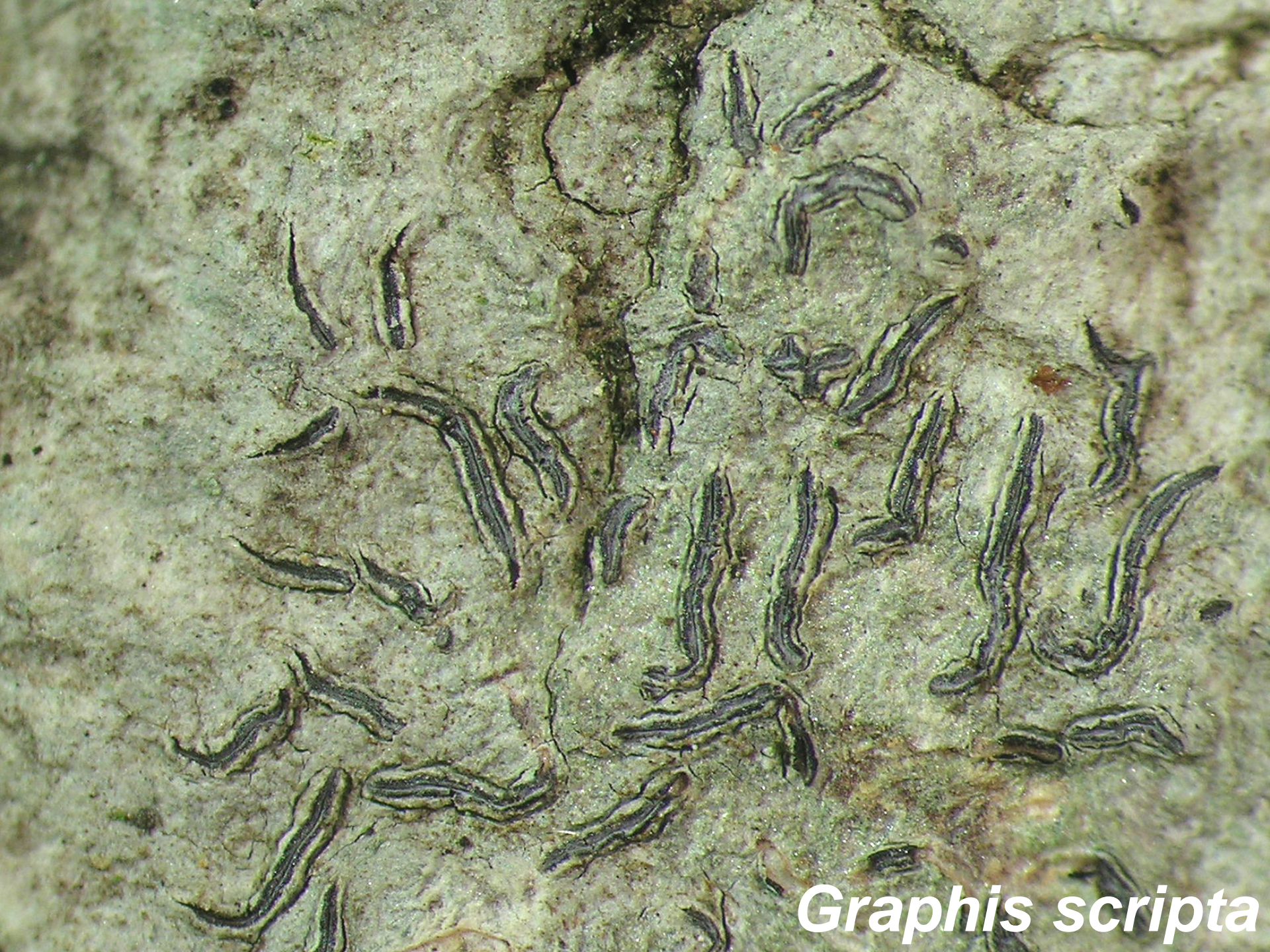*Pseudocyphellaria crocata*

Pacific North West

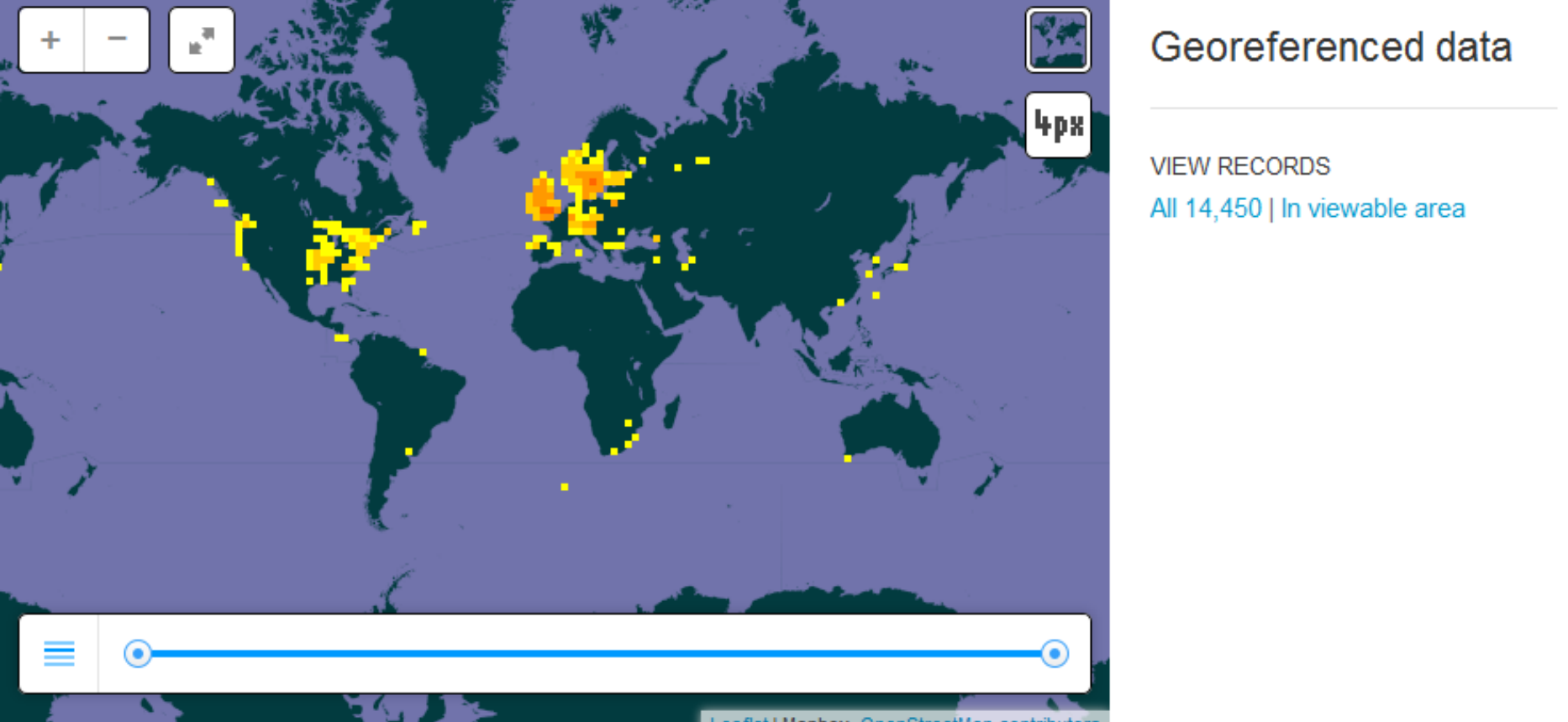**SYMBIOTA: Occurrence data**
Pseudocyphellaria crocata
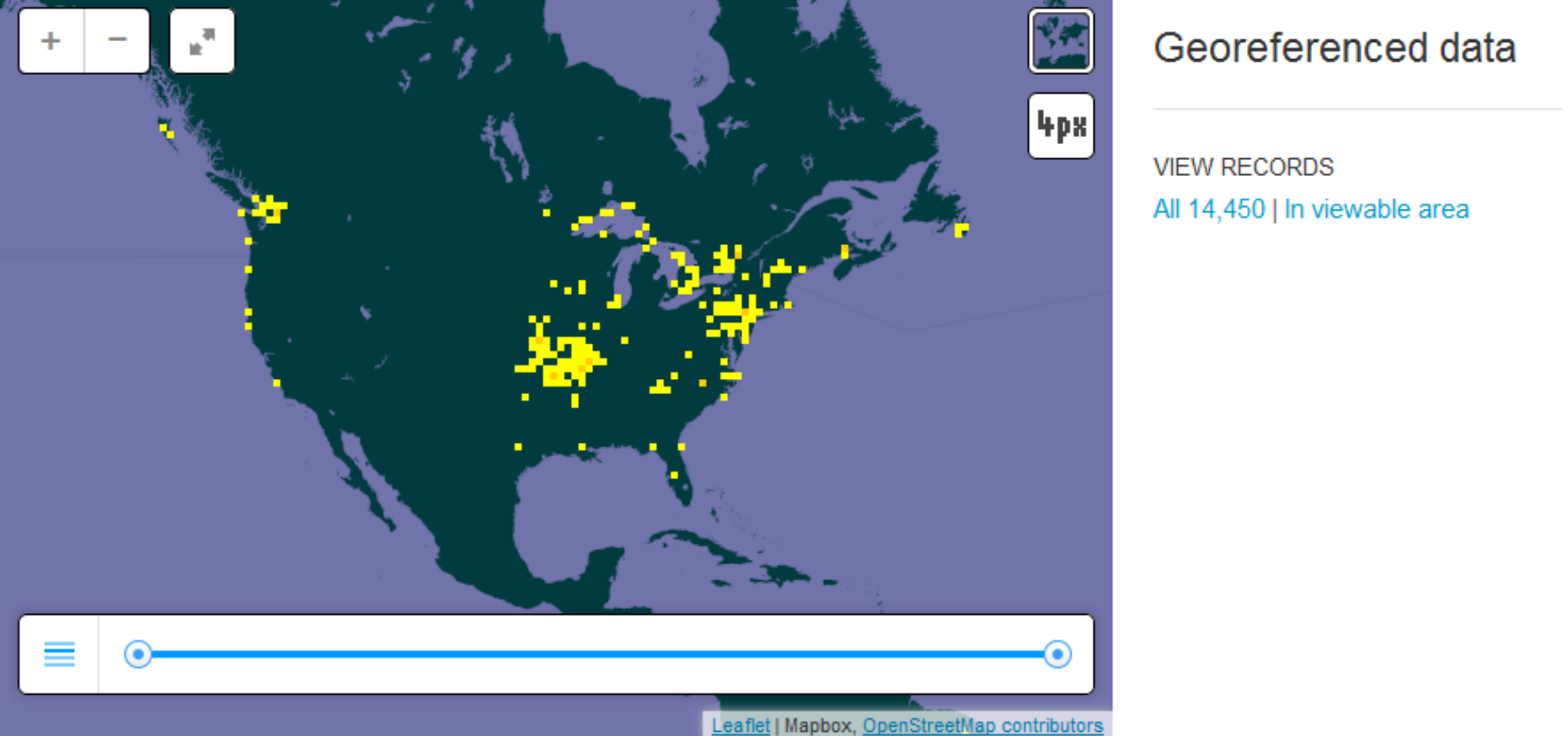
Wash-ington

Three species!

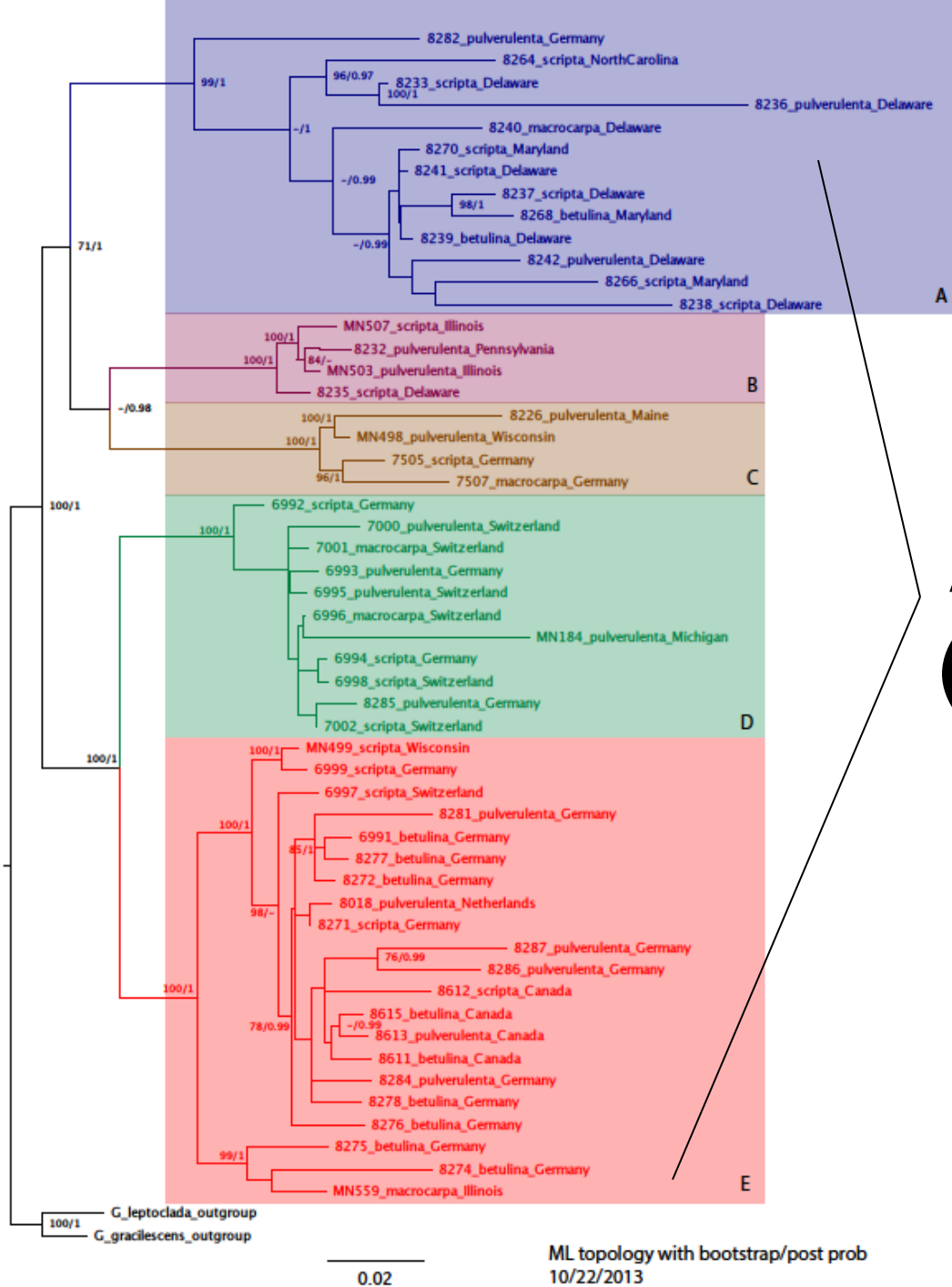**SYMBIOTA: Occurrence data**
Pseudocyphellaria crocata

Graphis scripta

GBIF: Occurrence data *Graphis scripta* (global)

GBIF: Occurrence data *Graphis scripta* (North America)

Up to 2011:
A single species
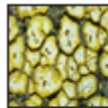(*Graphis scripta*)

Now:
At least six
distinct species

ML topology with bootstrap/post prob
10/22/2013

Cora glabrata

SYMBIOTA: Occurrence data
Cora glabrata

Arizona State University Lichen Herbarium

ASU

Catalog #: 522459
Taxon: *Dictyonema glabratum* (Spreng.) D. Hawksw.
Family: Corticiaceae
Determiner: T.L. Esslinger: Checklist of North America, 2002
Collector: T.H. Nash III   29128
Date: 05 January 1990
Locality: Venezuela, Mérida, , 17 km SE of Bailadores
   80.2166667 -71.875
   Elevation: 2600 meters (8528ft)
Substrate: roadbank

SYMBIOTA: Occurrence data
Cora glabrata

Corella
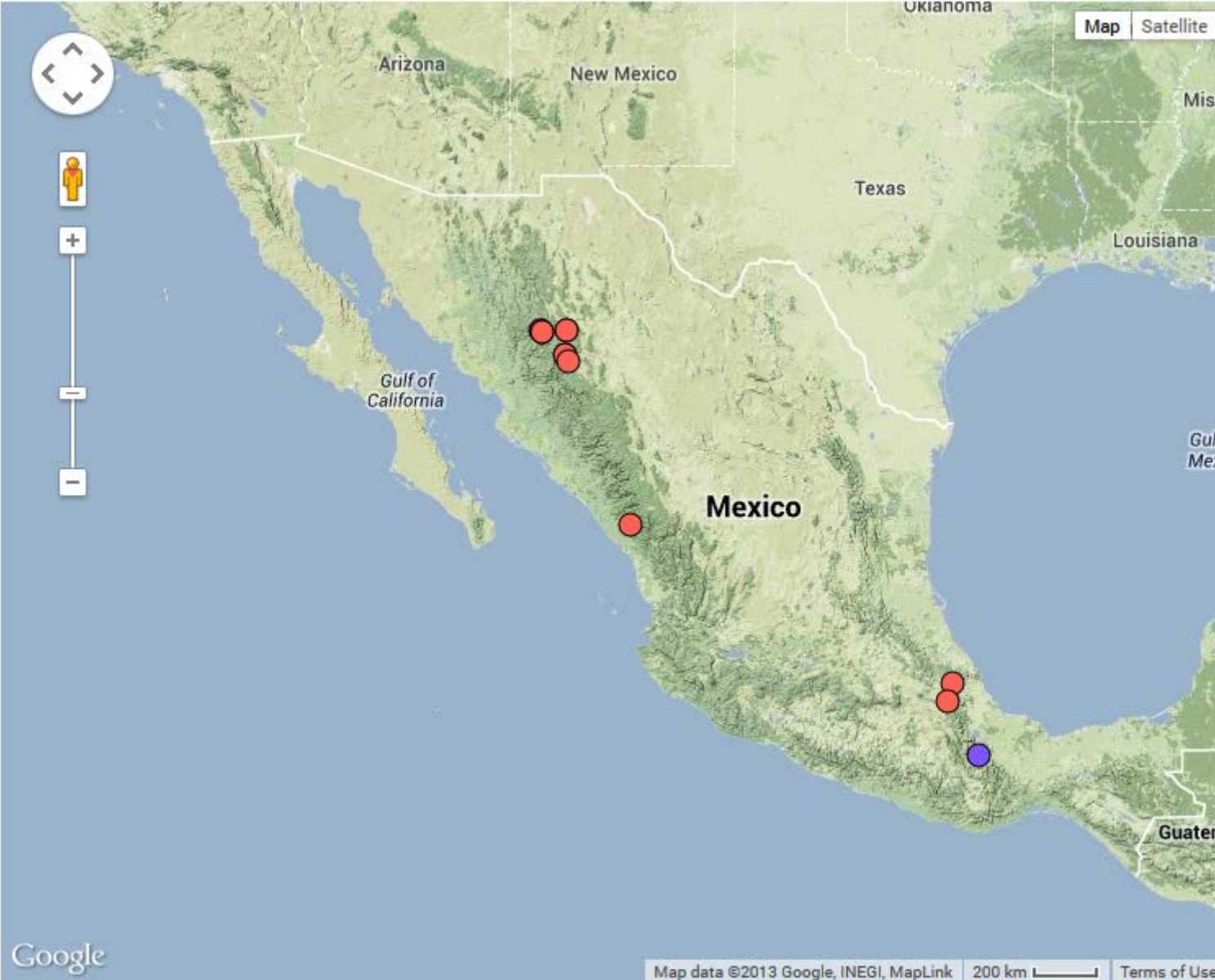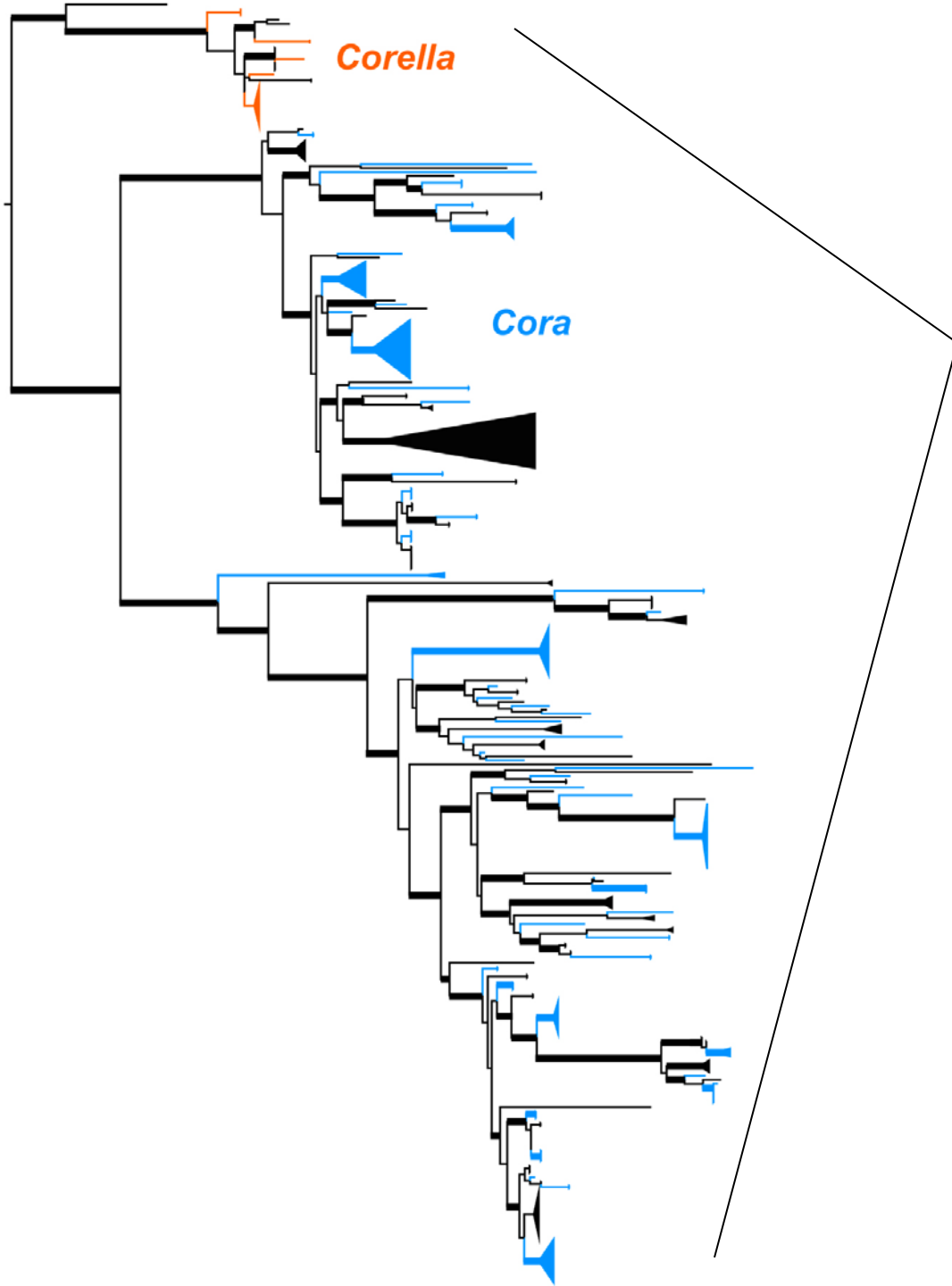
Cora

**Up to 2009:
A single species
(*Cora glabrata*)**

**Now:
Over 100
distinct species**

How can we address this problem?
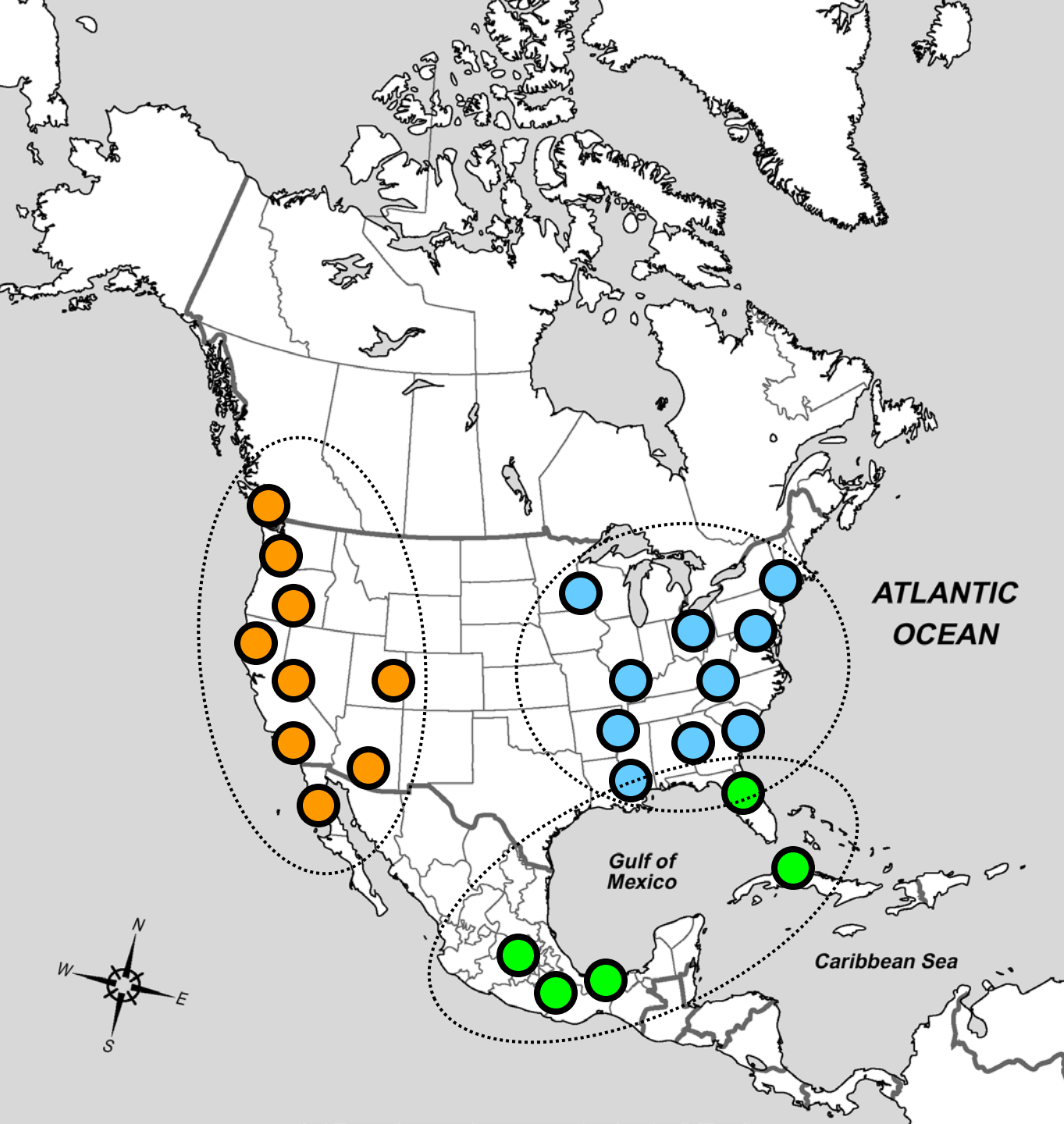
In an ideal world:

New round of NSF Funding (ATRBC)

"Advancing Taxonomic Revisions of Biological Collections"

Organize ourselves in TRNs

"Taxonomic Revisionary Networks"

In the real world:

Effective and largely automated ways to single out problematic records

Not only feed collections data into research but also feed research data into collections

"Global automated annotations"

1. Apply reliability ("quality") scores to each identification using a combination of:

**Date of most recent identification
Identification authority
Cited in monographic work?
Voucher for DNA studies?**

Quality score ranging from 1 to 10

2. Using automated georeferencing and statistical tools
to single out and prioritize problematic occurrence records
for taxonomic revision

3. Generate a network of taxonomic experts and automatically
alert experts about specific problematic occurrence records

4. Connect published and unpublished research to collections data through taxonomic experts network

"Global automated annotations"

Automated annotations include indication of tools and level of expertise required to correctly identify species.

1. Apply reliability ("quality") scores
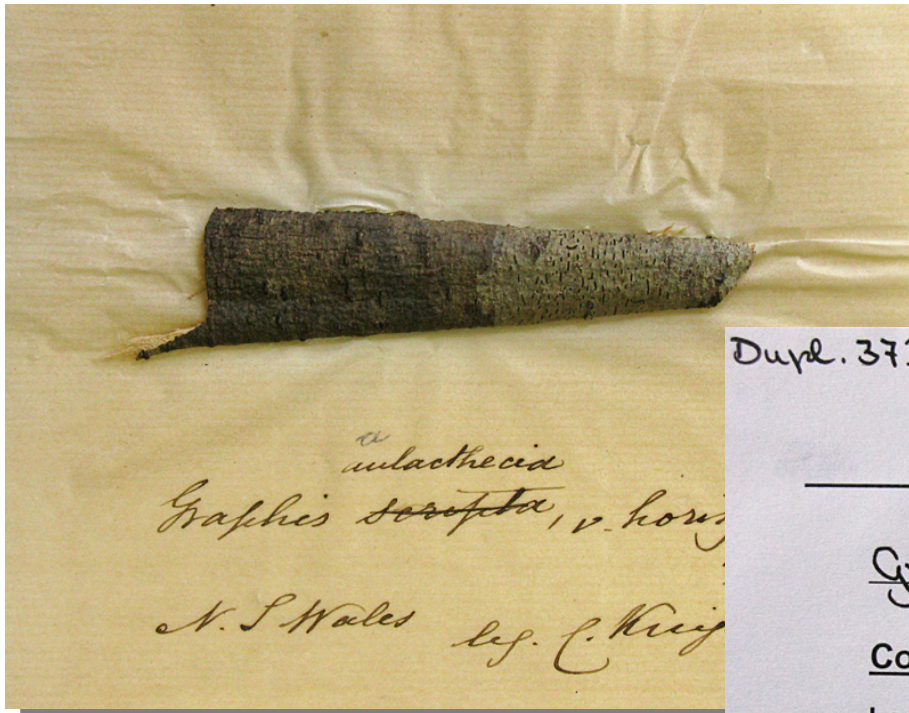
Score = 10

Score = 1

2. Using automated georeferencing and statistical tools
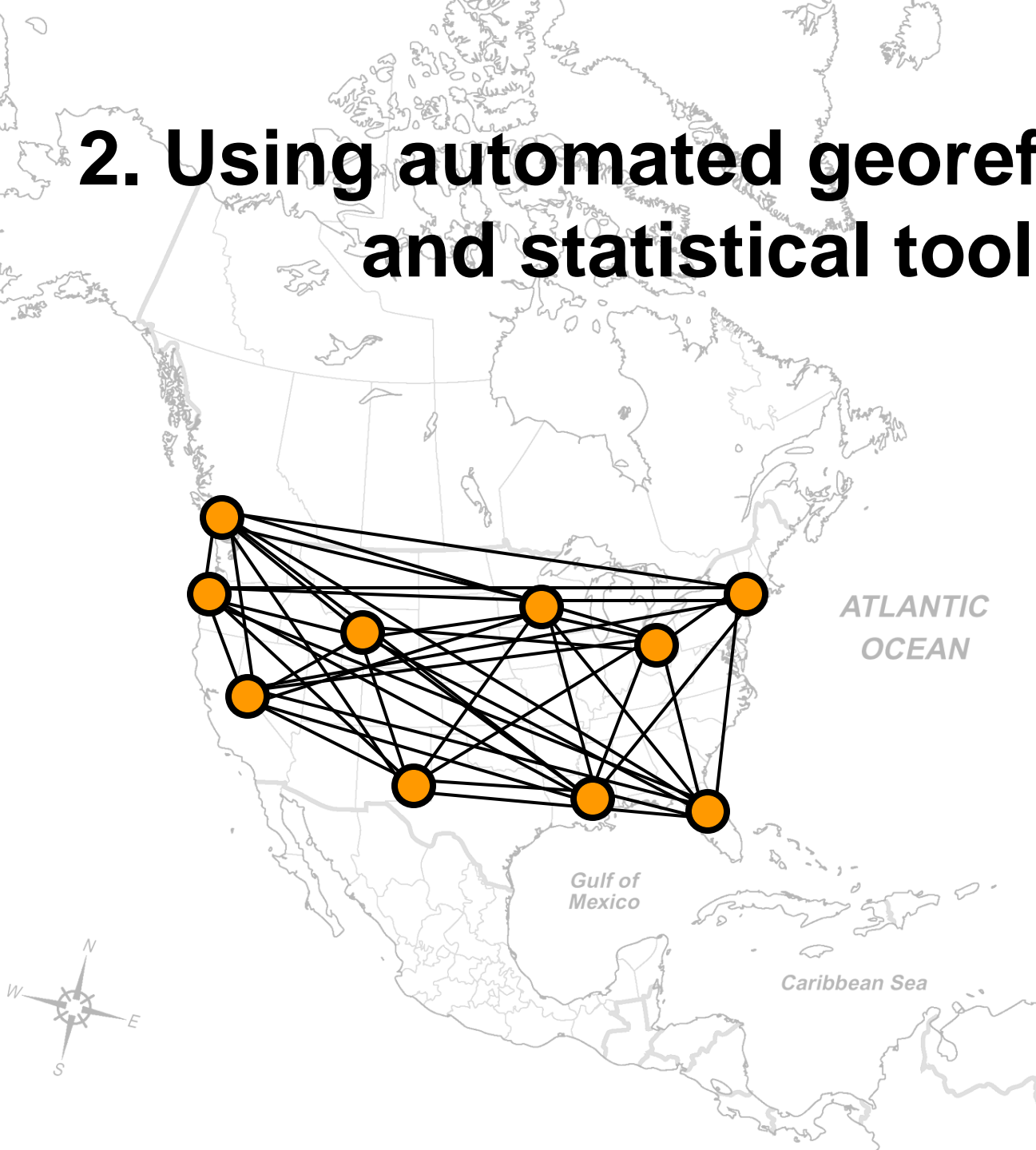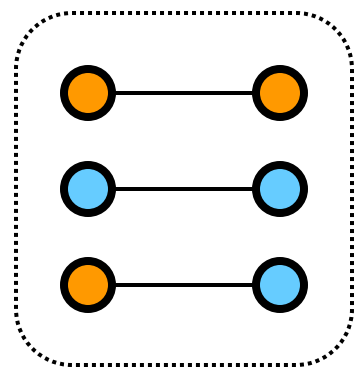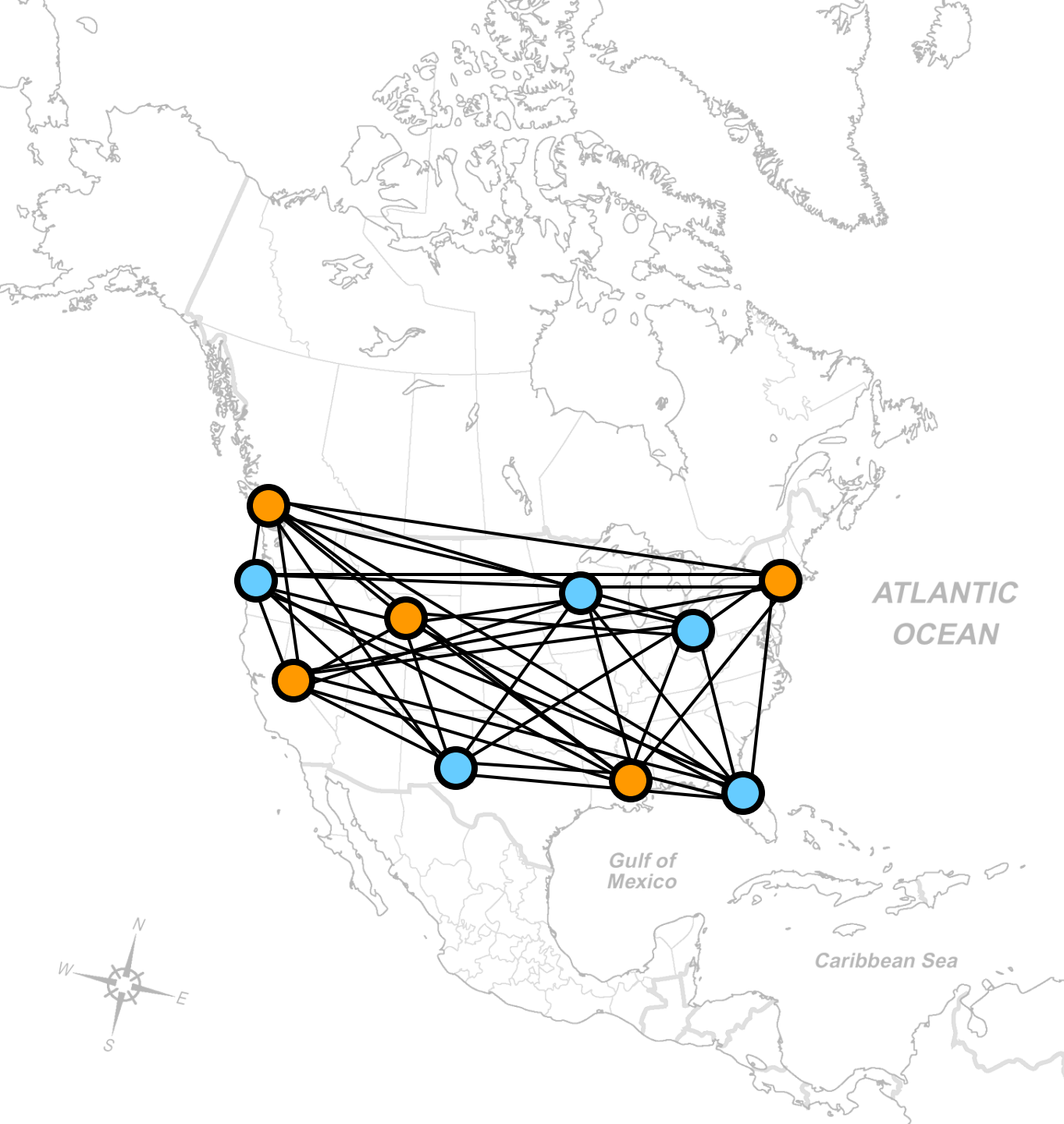
High quality score

Low quality score

3. Generate a network of taxonomic experts with automated alerts

Taxonomic experts database

Indicate taxonomic groups of expertise

Automatically send specimen alerts to indicated expert

4. Connect published and unpublished research to collections data through universal portals

Annotated specimen:
"point" correction

Annotated name:
global "alert" for all specimens identified with that name

"Global automated annotation" of species name:

Published reference and/or authority

Alternative correct identifications for a given name

Requirements to revise specimen (macroscopic, microscopic, DNA)

Magnitude of the problem?

Per institution:

1. Select 100 samples randomly
2. Evaluate correct identification
3. Score percentage of correct identification against:

Date of most recent identification
Identification expertise