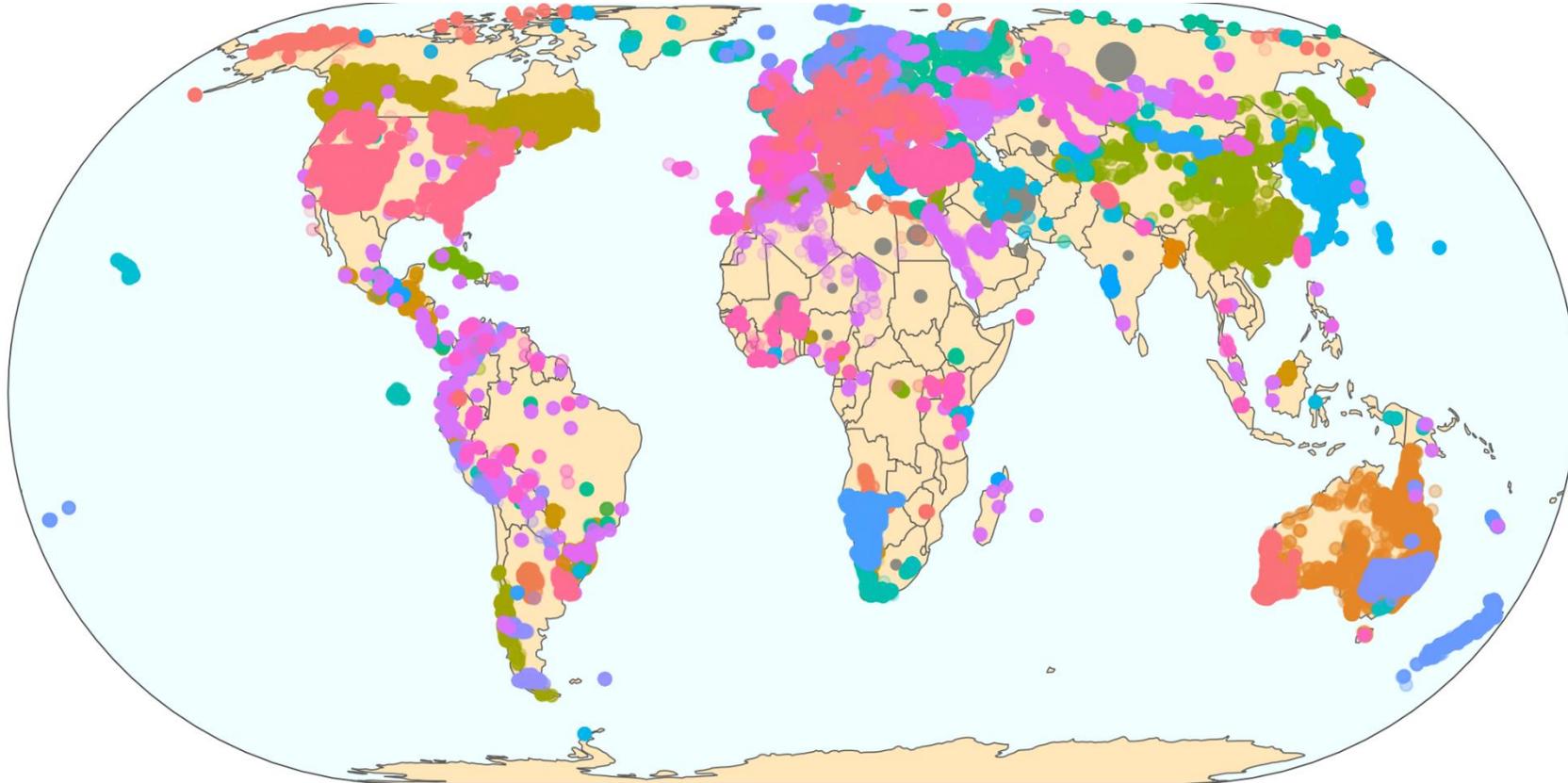# sPlot 4.0: towards a truly global database for understanding vegetation spatiotemporal changes



**Gabriella Damasceno**, G Hähn, I Biurun, M Chytrý, F Sabatini, S Wiser, H Bruelheide &

all members of the sPlot consortium

# One year ago in Madrid...

# Release of sPlot 4!

# The sPlot project

- Collaborative global database of vegetation plots

- Globally widespread:
  - 7 continents
  - 141 countries
  - 518 ecoregions
  - all biogeographic realms



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# The sPlot project



- Collaborative global database of vegetation plots

- Globally widespread:
  – 7 continents
  – 141 countries
  – 518 ecoregions
  – all biogeographic realms

- Aimed to understand global patterns of plant diversity

65th Annual Symposium
**IAVS 2023**
AUSTRALIA
*The Future of Vegetation in the 22nd Century*
3 - 8 September 2023 Coffs Harbour, Australia

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# The Future of Vegetation in the 22ⁿᵈ Century

# The Future of Vegetation in the 22<sup>nd</sup> Century



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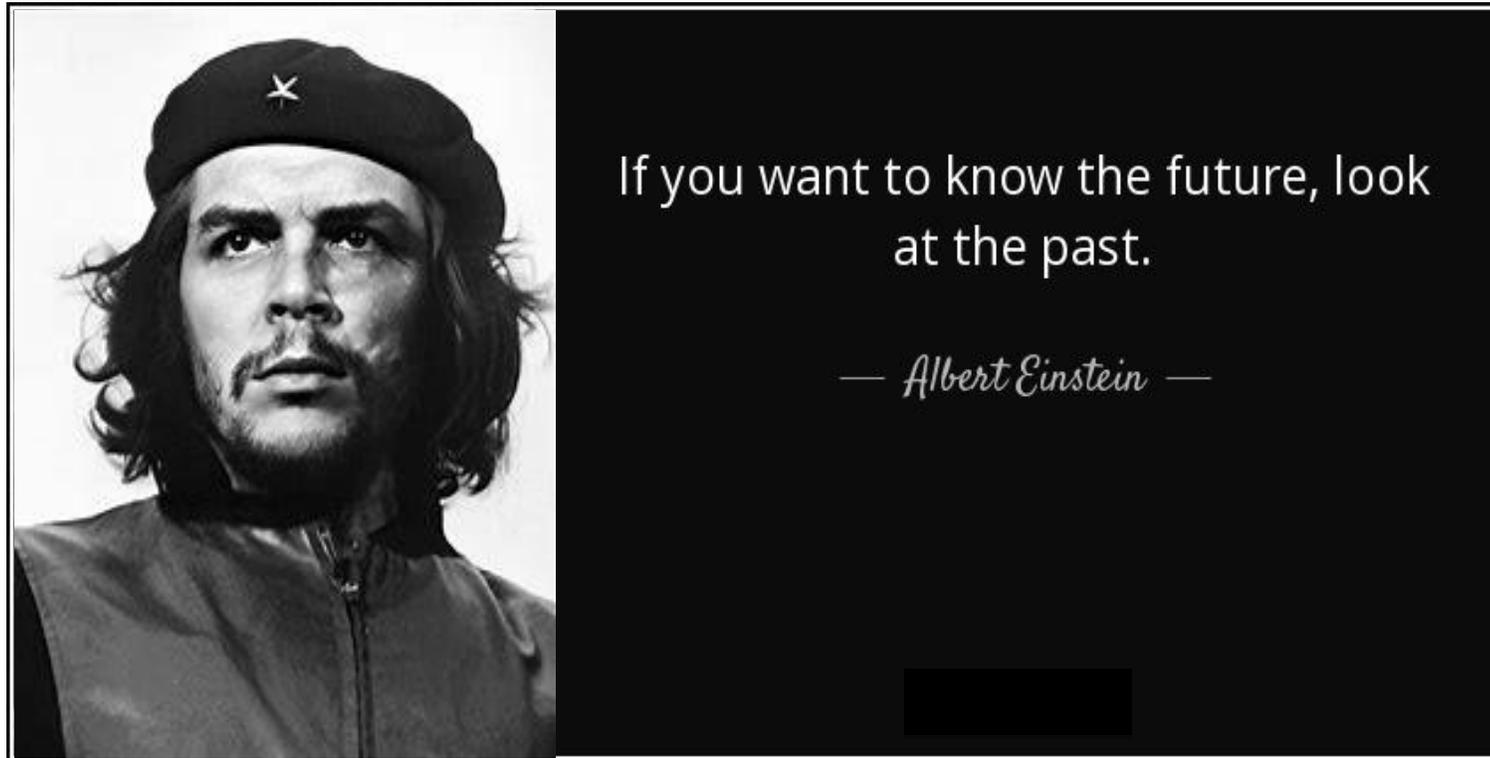
# The Future of Vegetation in the 22ⁿᵈ Century
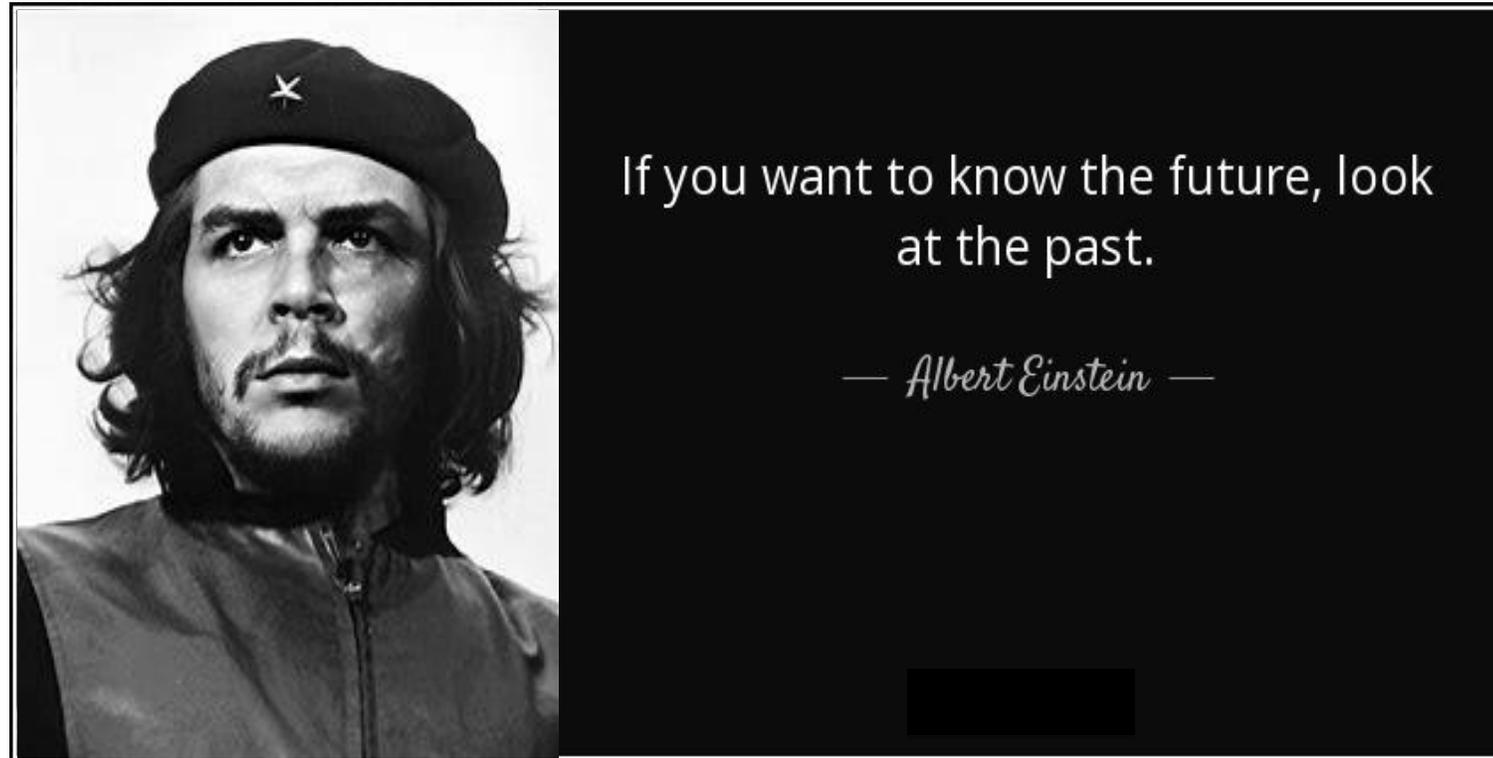


sPlot: input for modeling and monitoring

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# sPlot 4 in comparison to sPlot 3

# sPlot 4 in comparison to sPlot 3: contributors

- 335 members in total
  - 49 contributors from developing regions


- 129 new members
  - 26 new contributors from the developing regions (increase of 113%)
  - ReSurvey: 45 new contributors (35% of new members)
  - Global South: 50 new contributors (39% of new members)

# sPlot 4 in comparison to sPlot 3
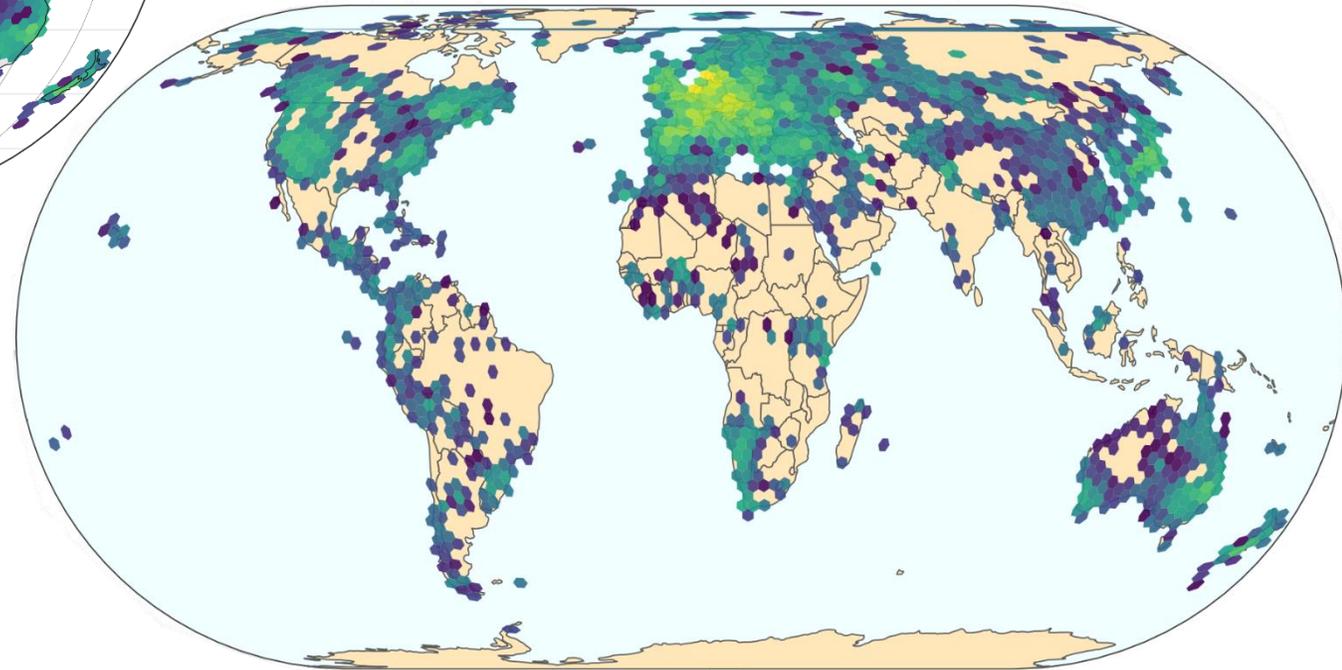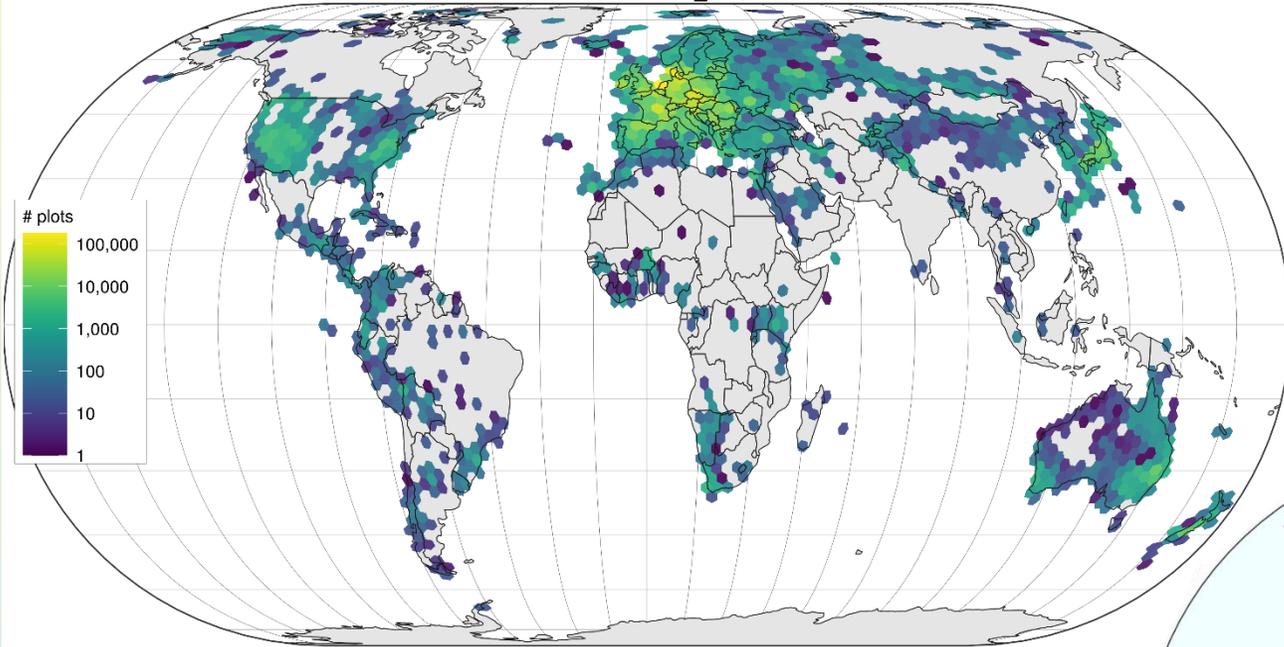


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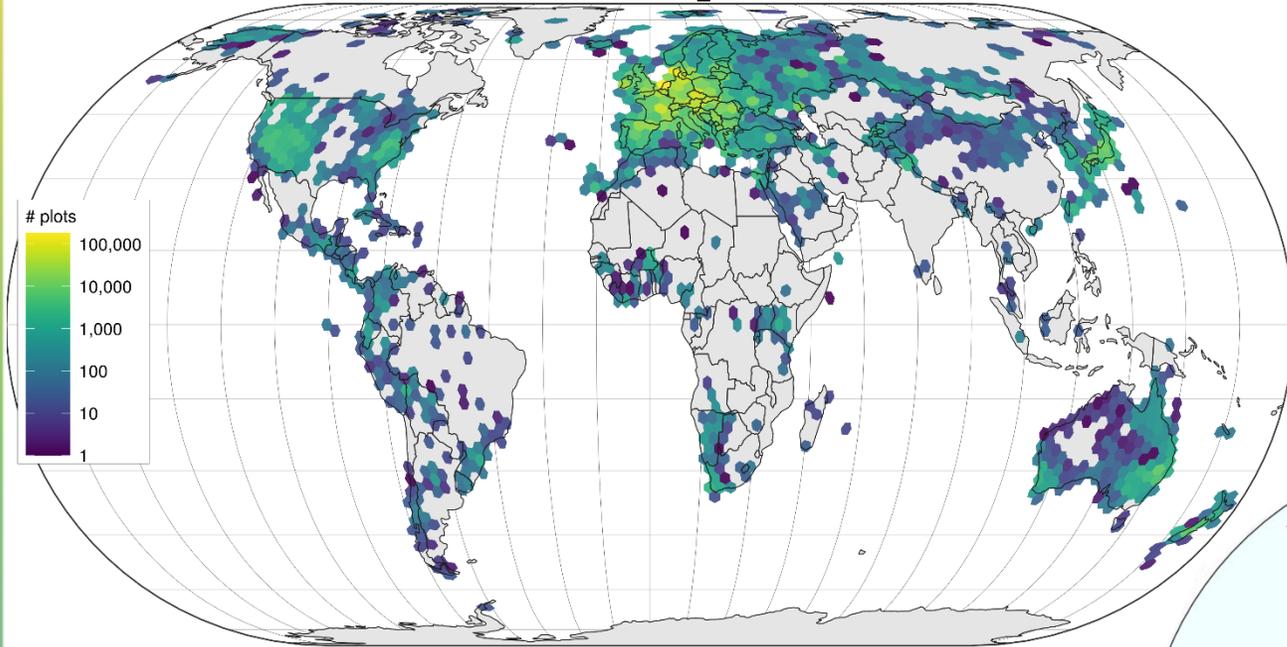# sPlot 4 in comparison to sPlot 3



- Increase of 85% in datasets
  – 308 in total

  – 142 new datasets

  – ReSurvey Europe:79
  (55% of new datasets)

# sPlot 4 in comparison to sPlot 3



- Increase of 85% in datasets
  - 308 in total

  - 142 new datasets
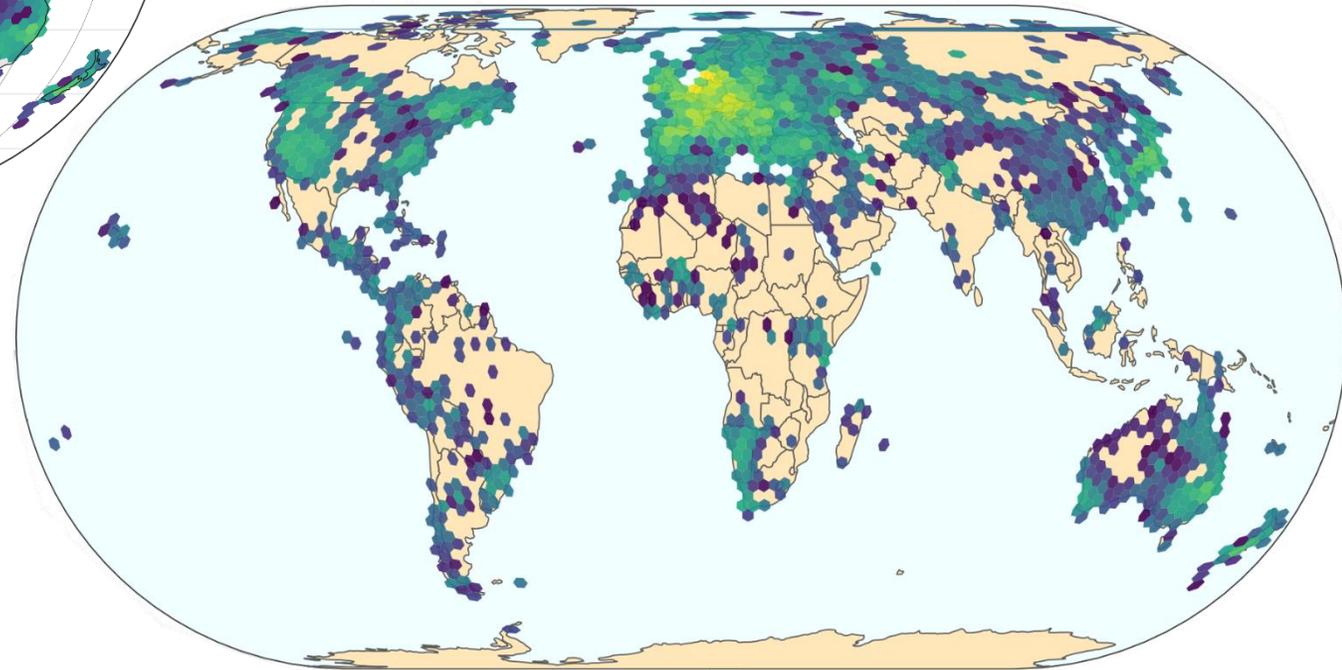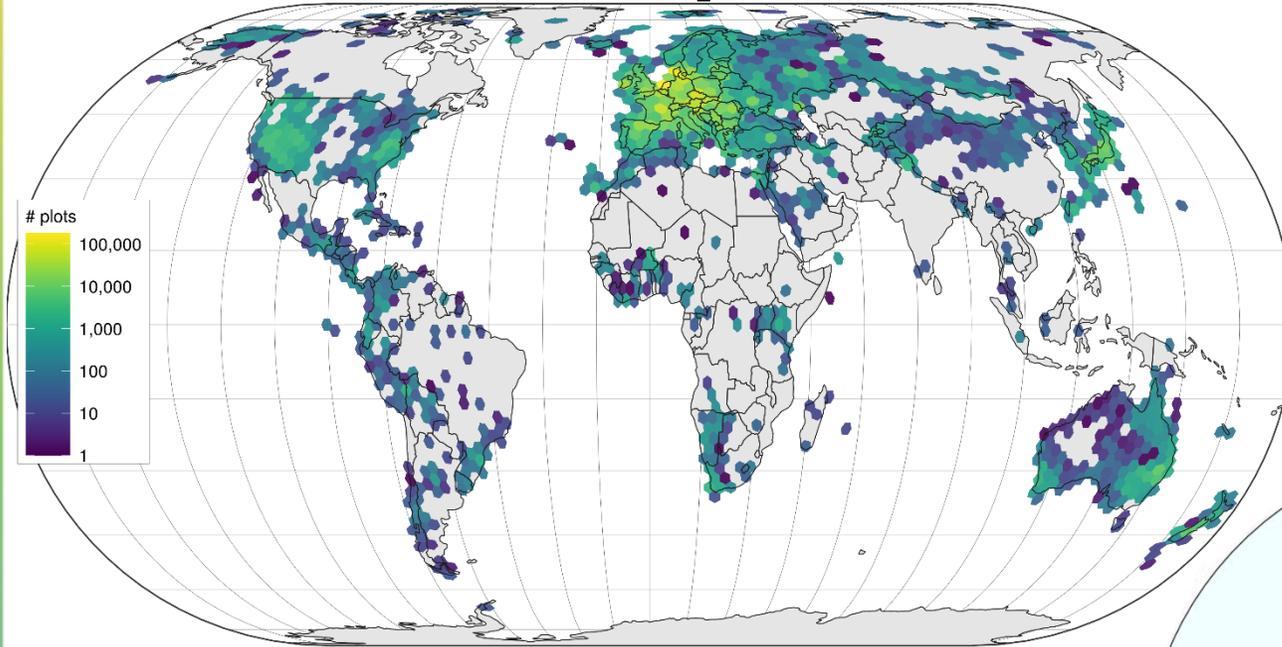
  - ReSurvey Europe: 79
  (55% of new datasets)

- Increase of 29% in plots
  - 2.5 million vegetation surveys

  - 570,220 new surveys
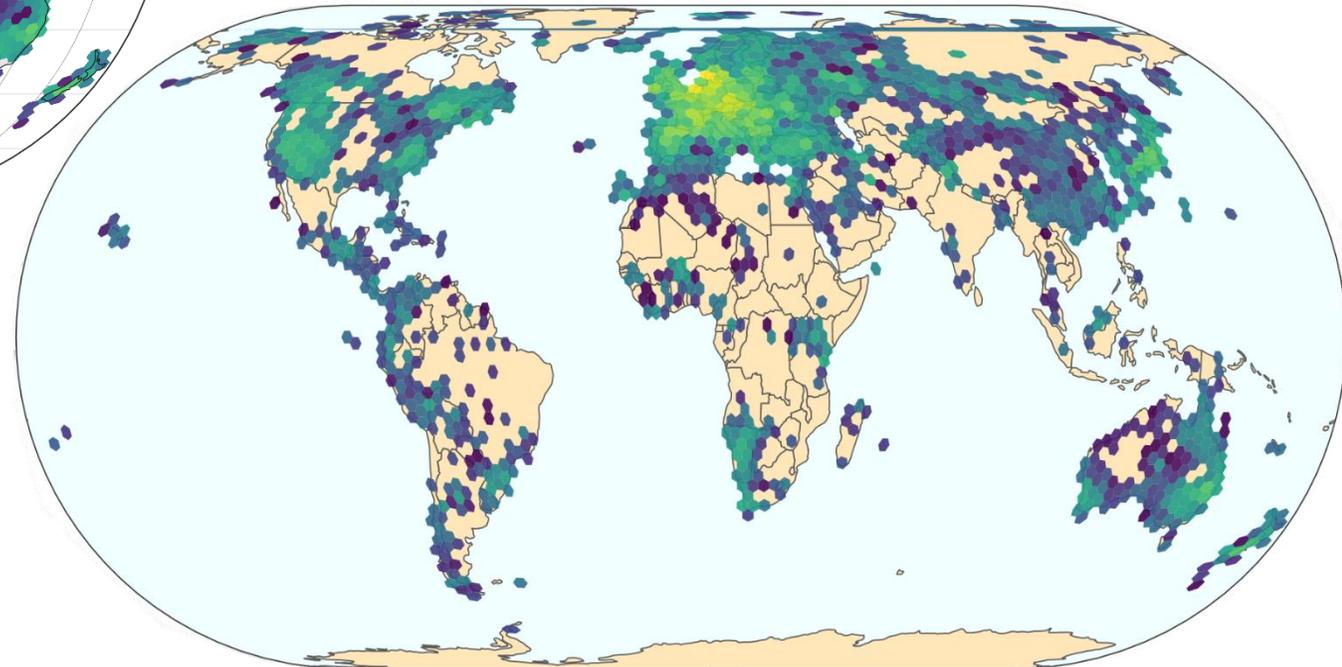
# Global South – developing countries

- Latin America

- Africa

- Asia
  – Israel
  – Japan
  – South Korea

- Oceania
  – Australia
  – New Zealand
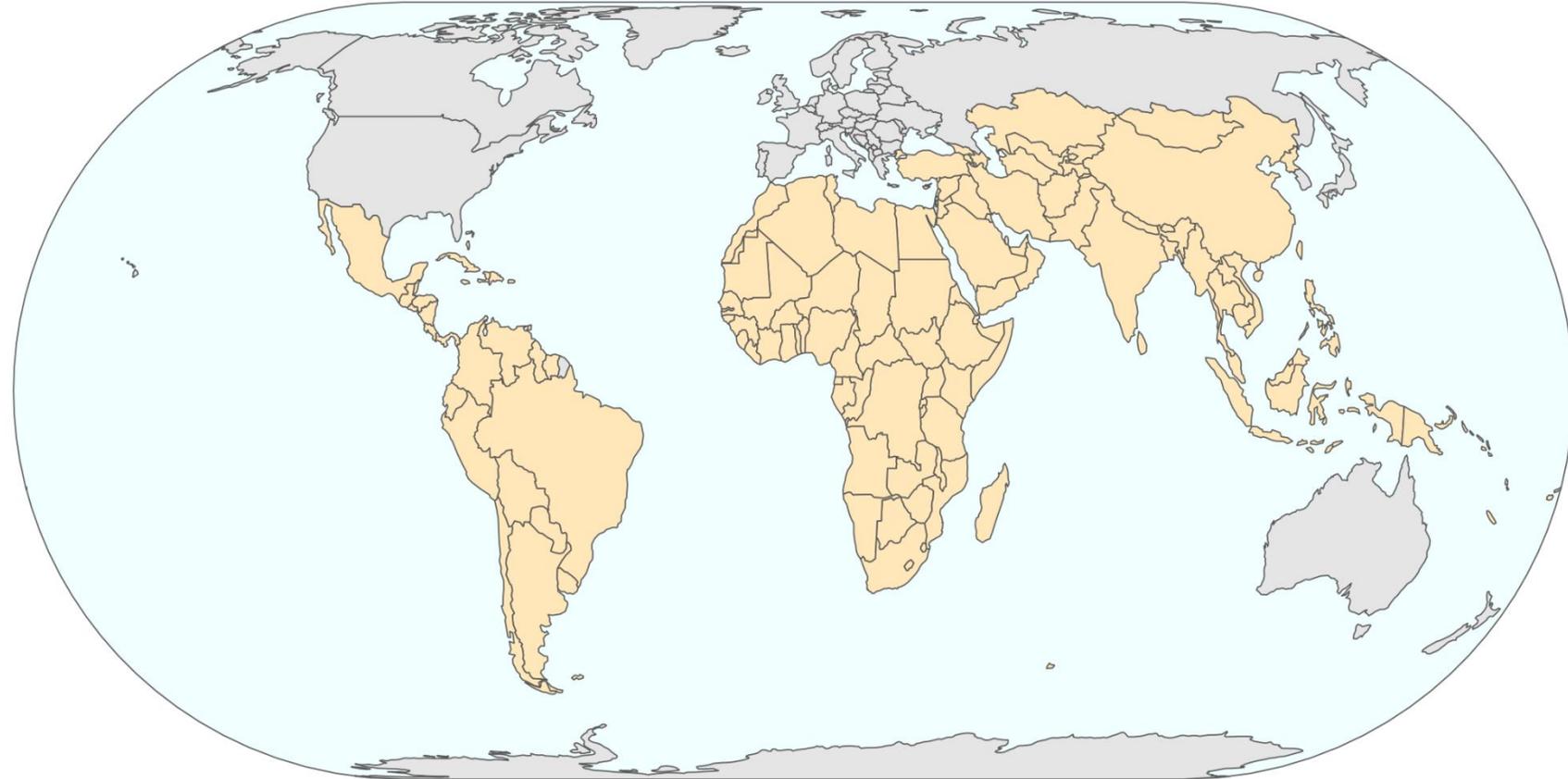
# Global South

- Total of 146,214 plots
  - New plots: 63,597 (increase of 77%)

- Nine new contributed countries

- Mostly in Asia and Africa
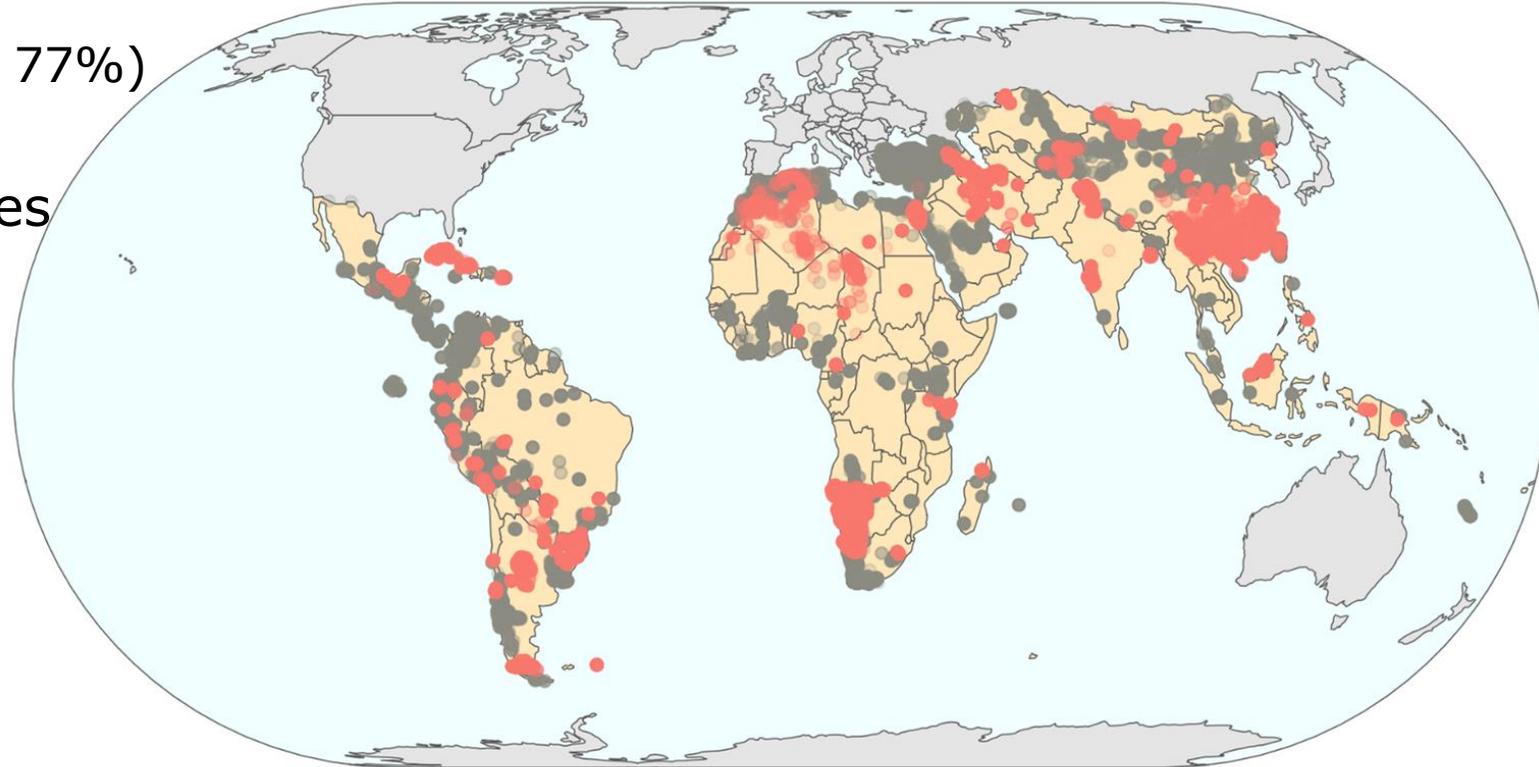
# Global South

- Asia
  - Armenia
  - Kuwait
  - North Korea
  - United Arab Emirates

- Africa
  - Chad
  - Mauritania
  - Sudan
  - Western Sahara

- Central America
  - Guatemala
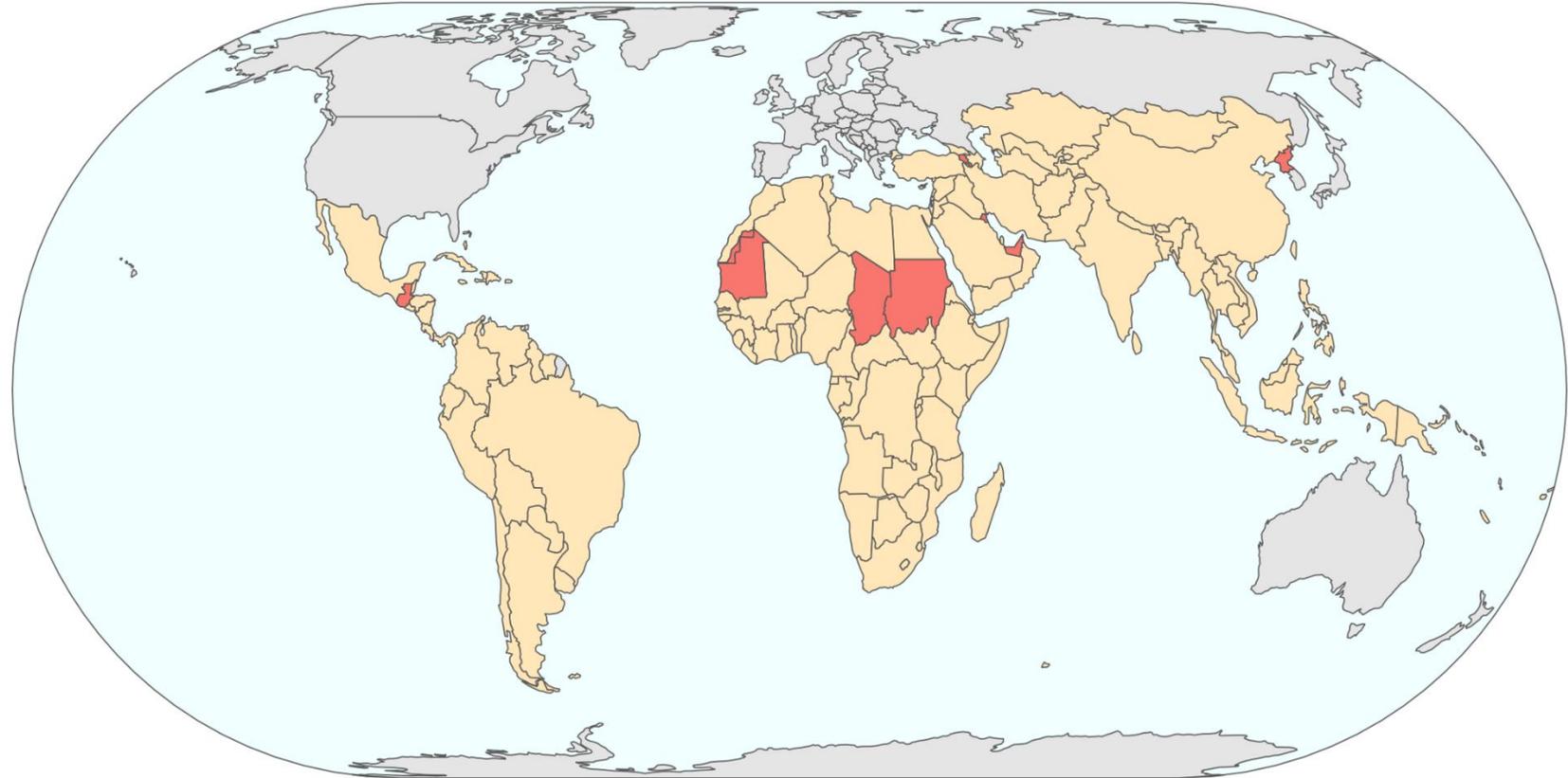
# Africa

**Namibia**
Ben Strohbach
Salomé Kruger

12,082 new plots

**Madagascar**
Daniel Handing
Heriniaina Randrianarison

200 new plots



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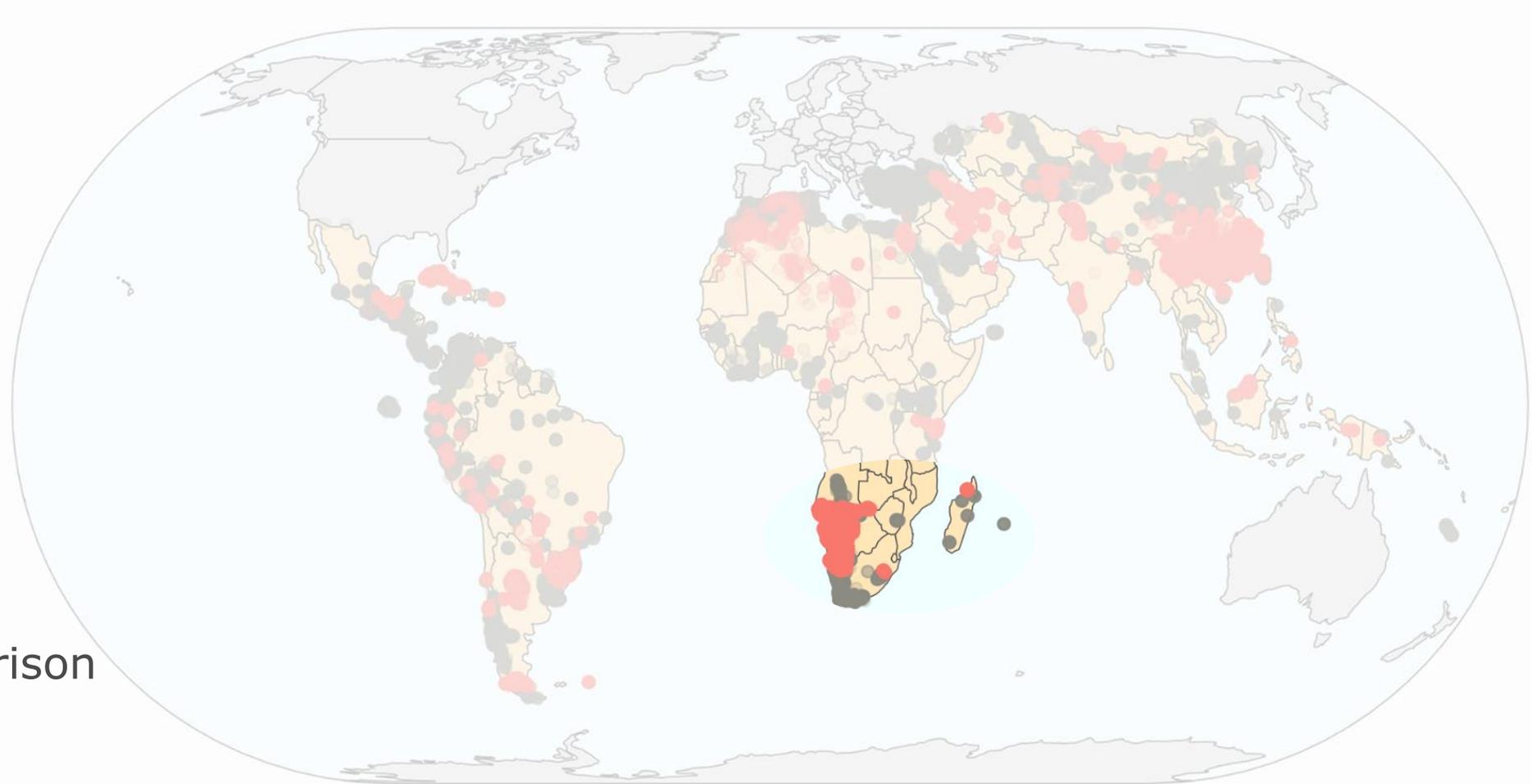
# Africa

**Saharo-Arabian Database**
Mohamed Zakaria Hatim

3,718 new plots

**Kenya Forests**
Maria Fungomeli
Alessandro Chiarucci

3,318 new plots
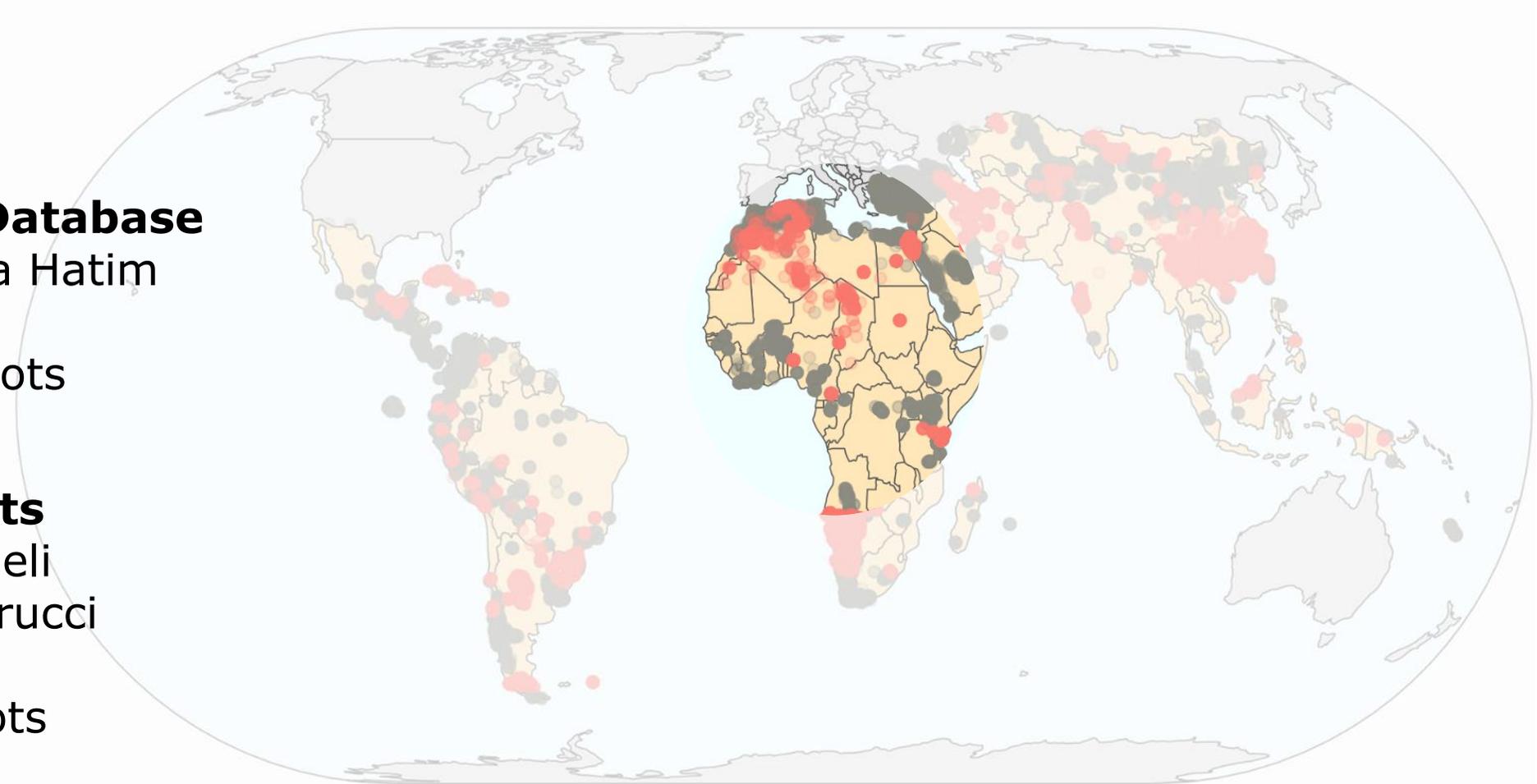
# Asia

### China Tropical
Jian Zhang
Houjuan Song

4,952 new plots

### Dzungarian Gobi
Oyundari Chuluunkhuyag
Karsten Wesche

644 new plots



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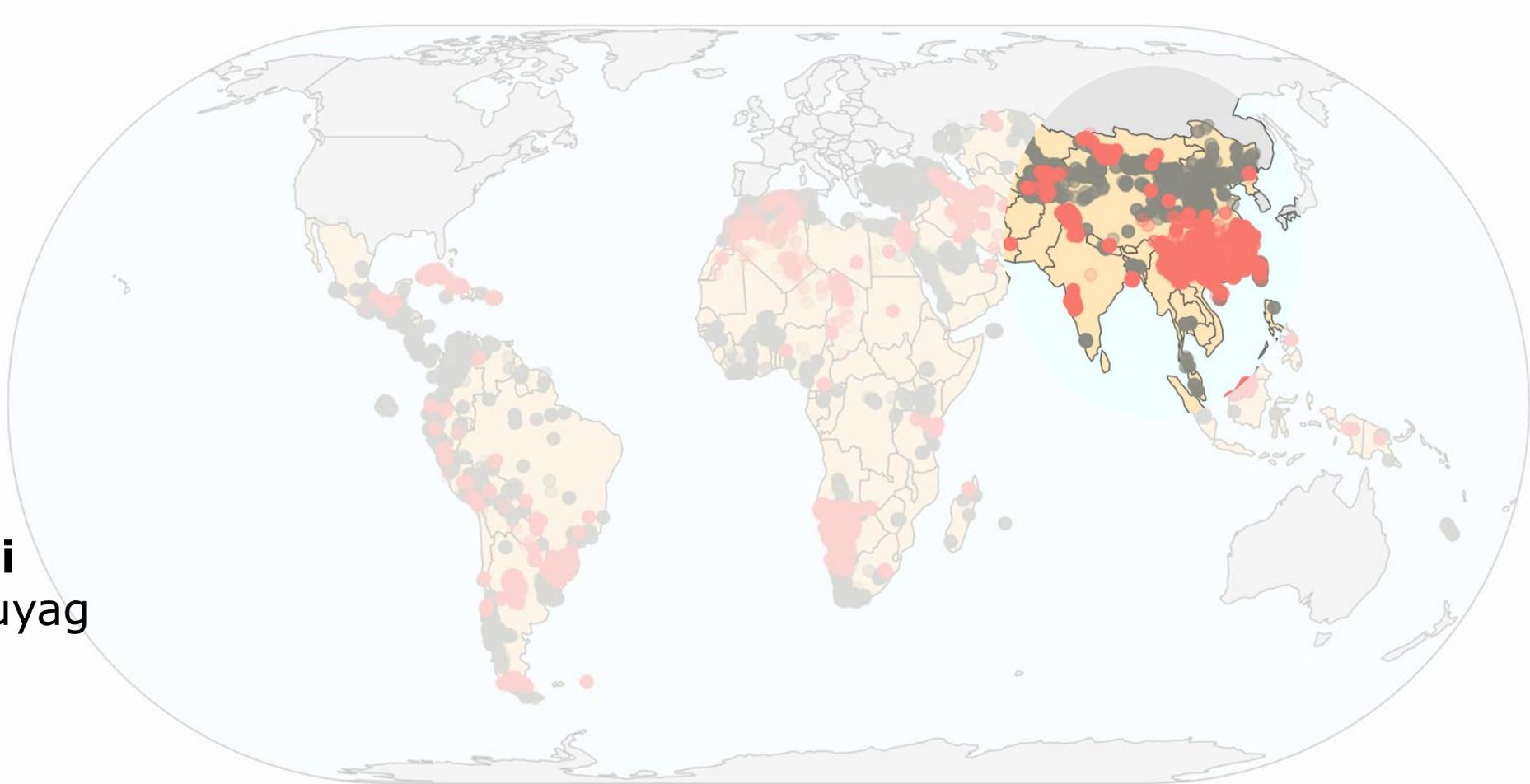
# Oceania

**Borneo**
Matthew Potts

1,618 new plots

**Philippines**
Sharif Mukul

20 new plots



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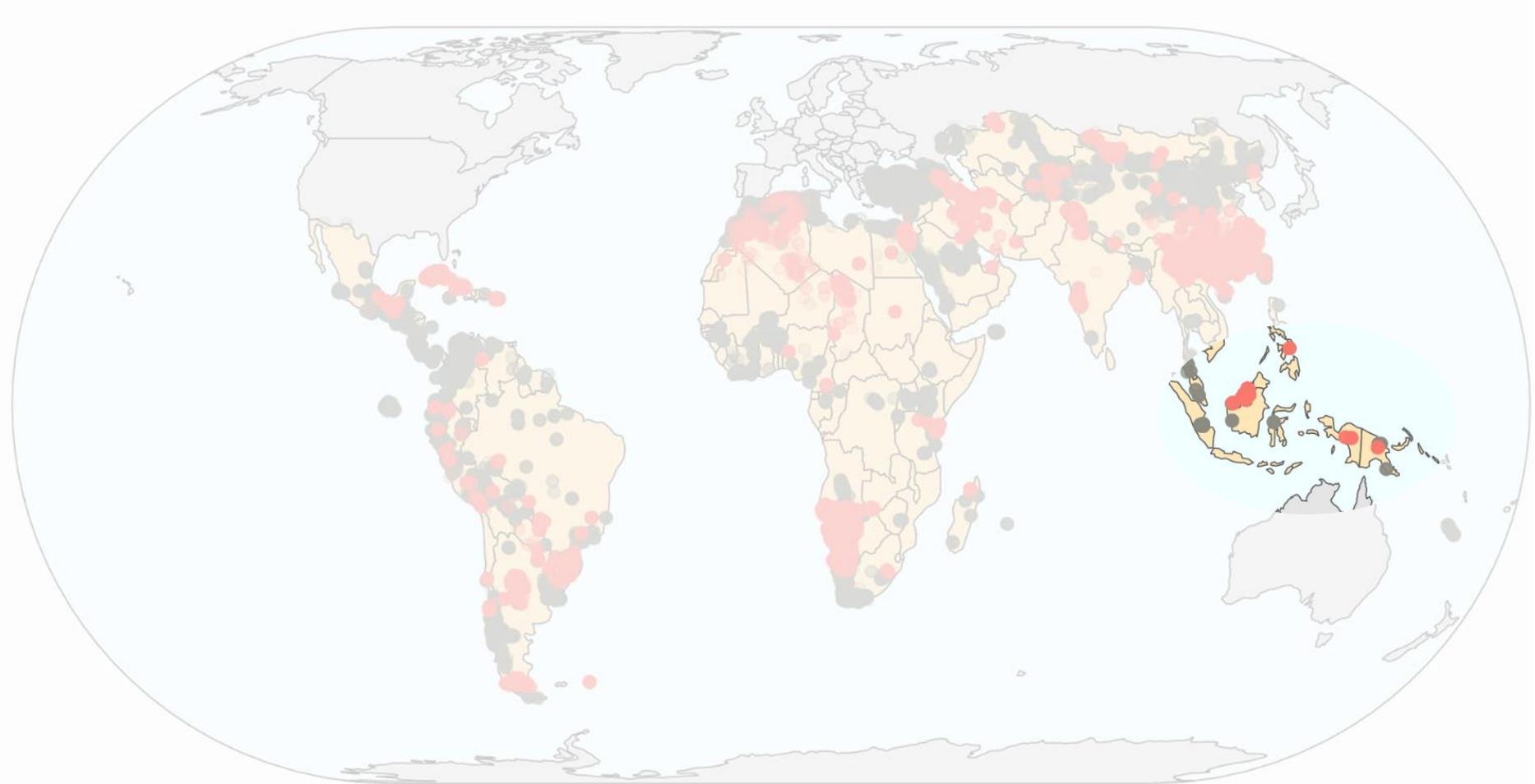
# South America

**Peru**
António Galán-de-Mera

181 new plots

**Atlantic Forest**
Sandra Cristina Müller
Kauane Maiara Bording
Joice Klipel
Rodrigo Scarton Bergamin
João André Jarenkow

1,600 new plots



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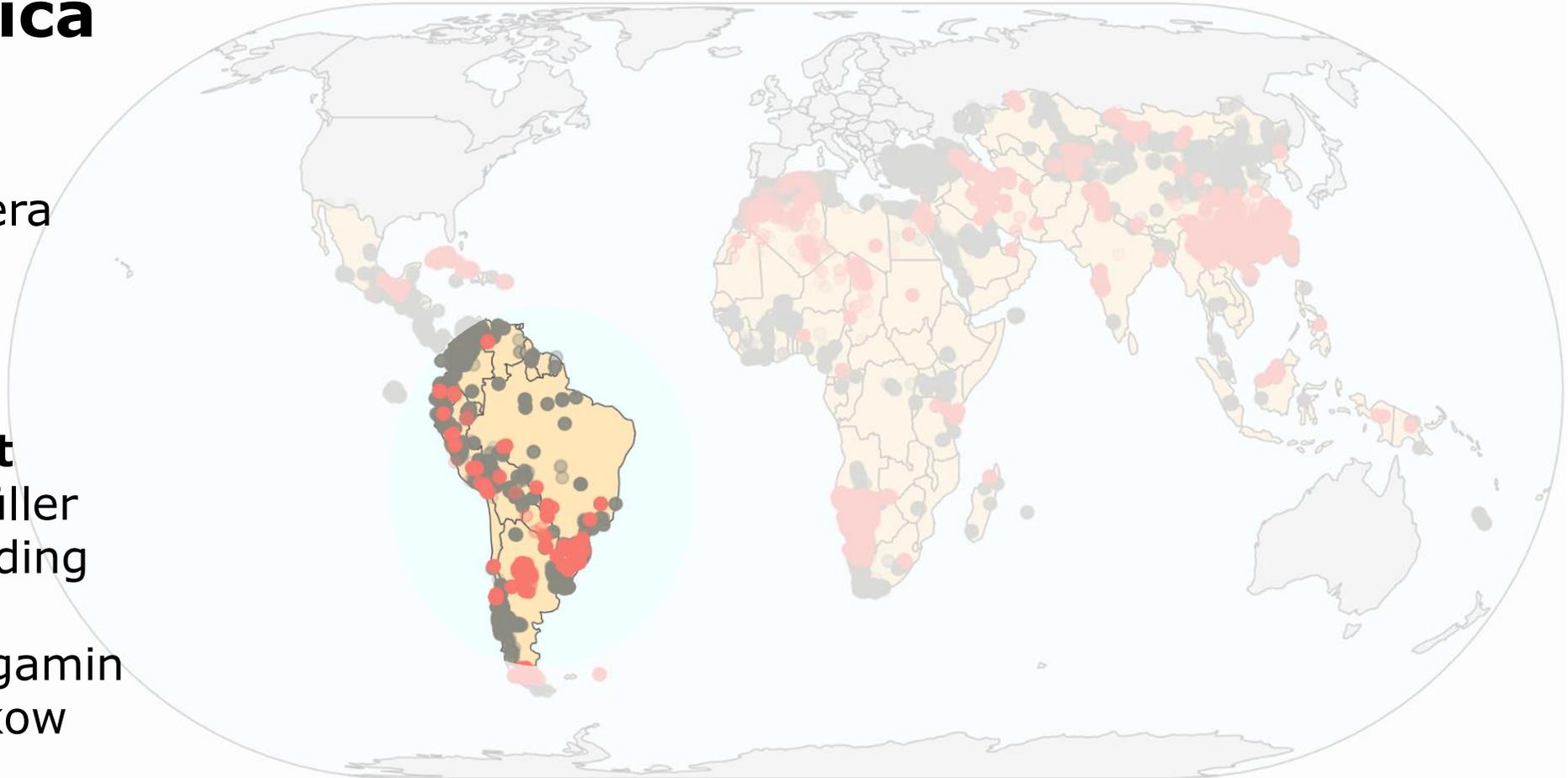
# South America

## Transecta Patagonia
Karina Speziale
Ana Cingolani

## 662 new plots



1 Vegetation of Southern Patagonia in the 70s - Digitization of a gray

2 literature dataset as a monitoring baseline in a changing world

3

4 Running title:

5 Historical vegetation plots of Southern Patagonia

6 Authors:

7 Francesco Maria Sabatini[1,2,*,†], Georg Hähn[3,†], Karina Speziale[4], Ana María Cingolani[5], Gabriella

8 Damasceno[6,3], Helge Bruelheide[3,6]

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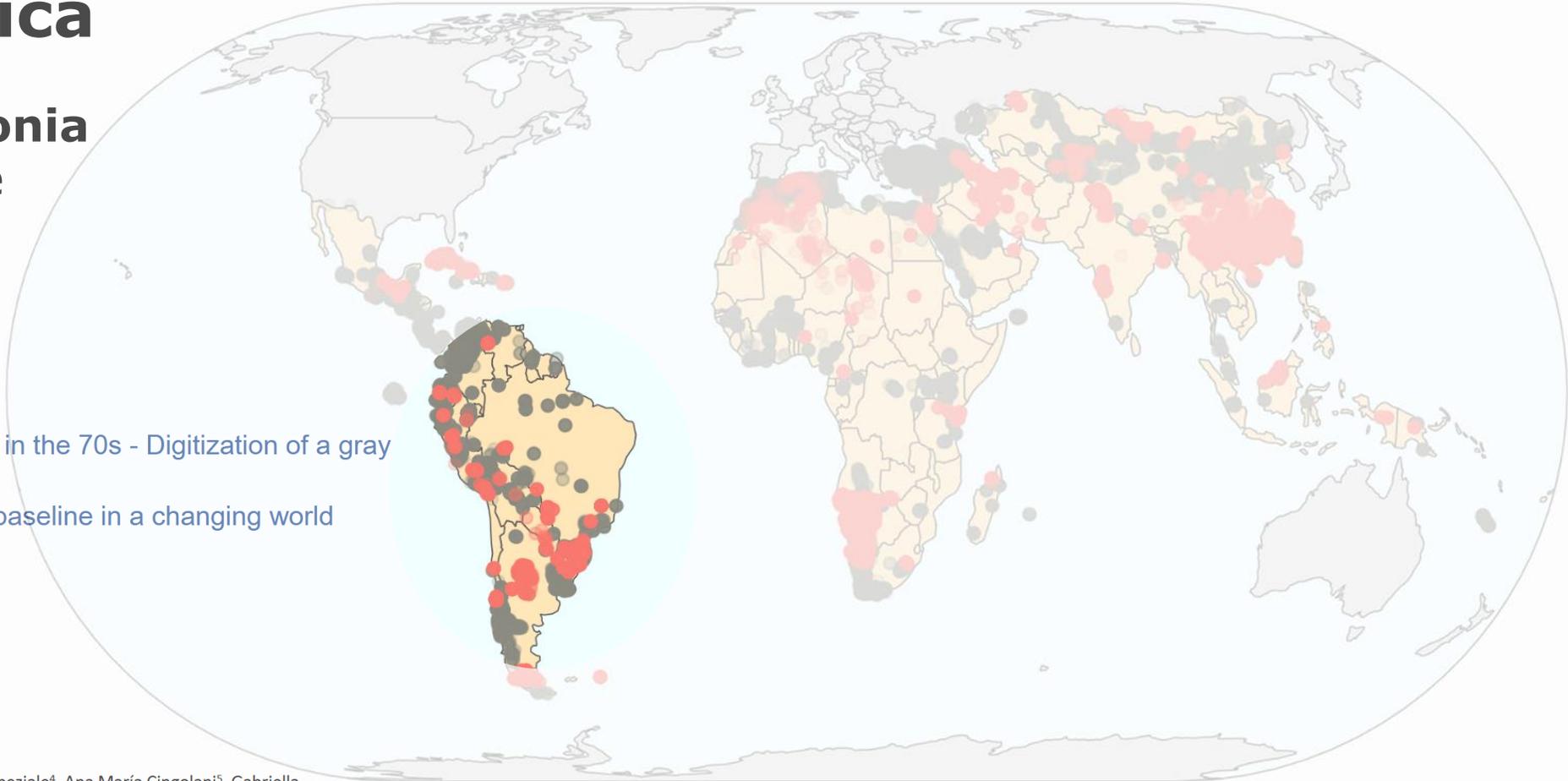
# Central America

**Puerto Rico**
Robert Muscarella
María Uriarte

24 new observations

**Mexican Rainforest**
Ricard Arasa Gisbert
Víctor Arroyo Rodrígues

1,487 new observations

# Asia

**Alpine and subalpine vegetation of NE Asia**
Jiri Dolezal
Kirill Korznikov

1,067 new plots

**Coniferous forests of Northeast Asia**
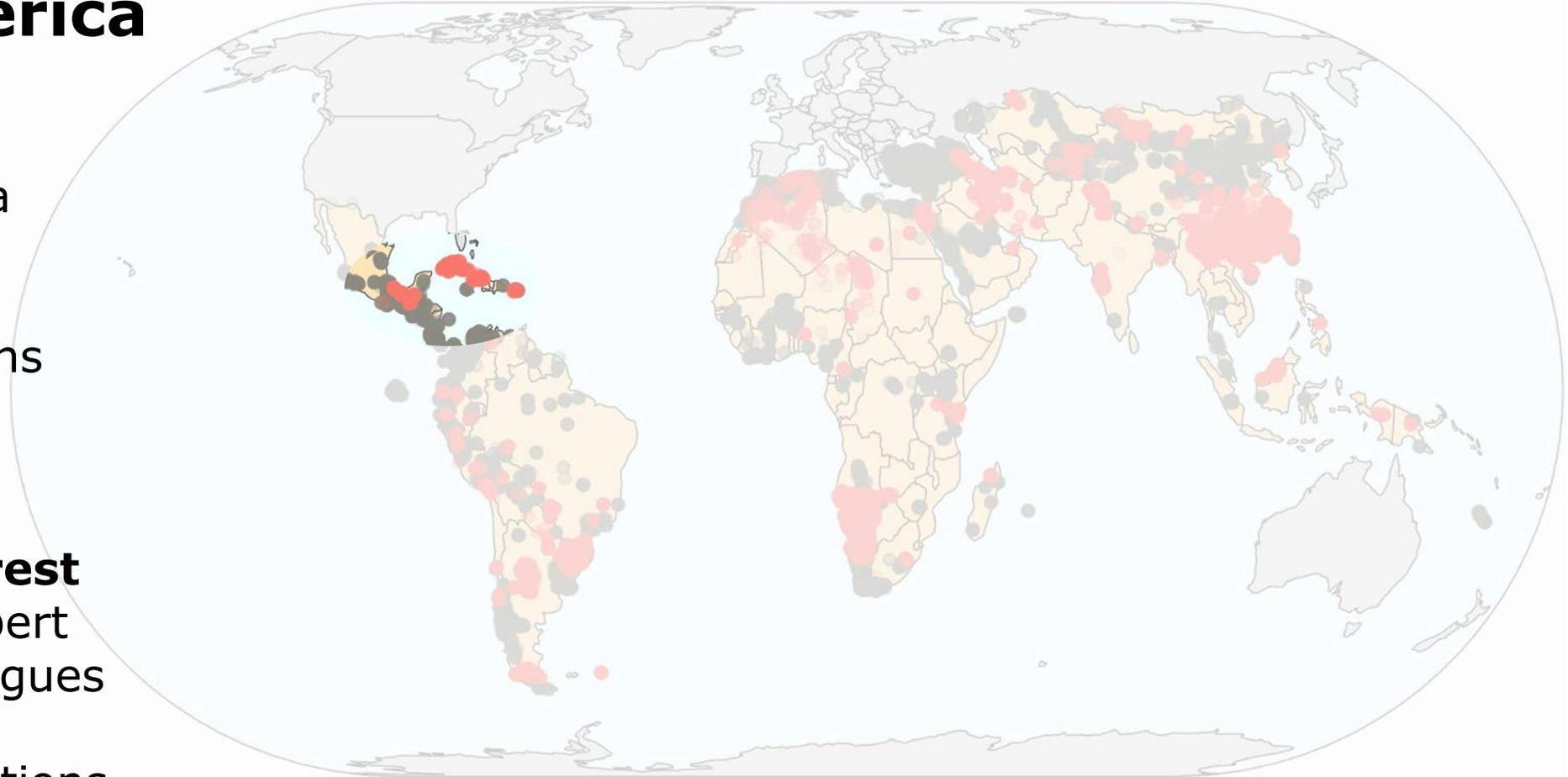Kiril Korznikov
Jiri Dolezal

454 new plots
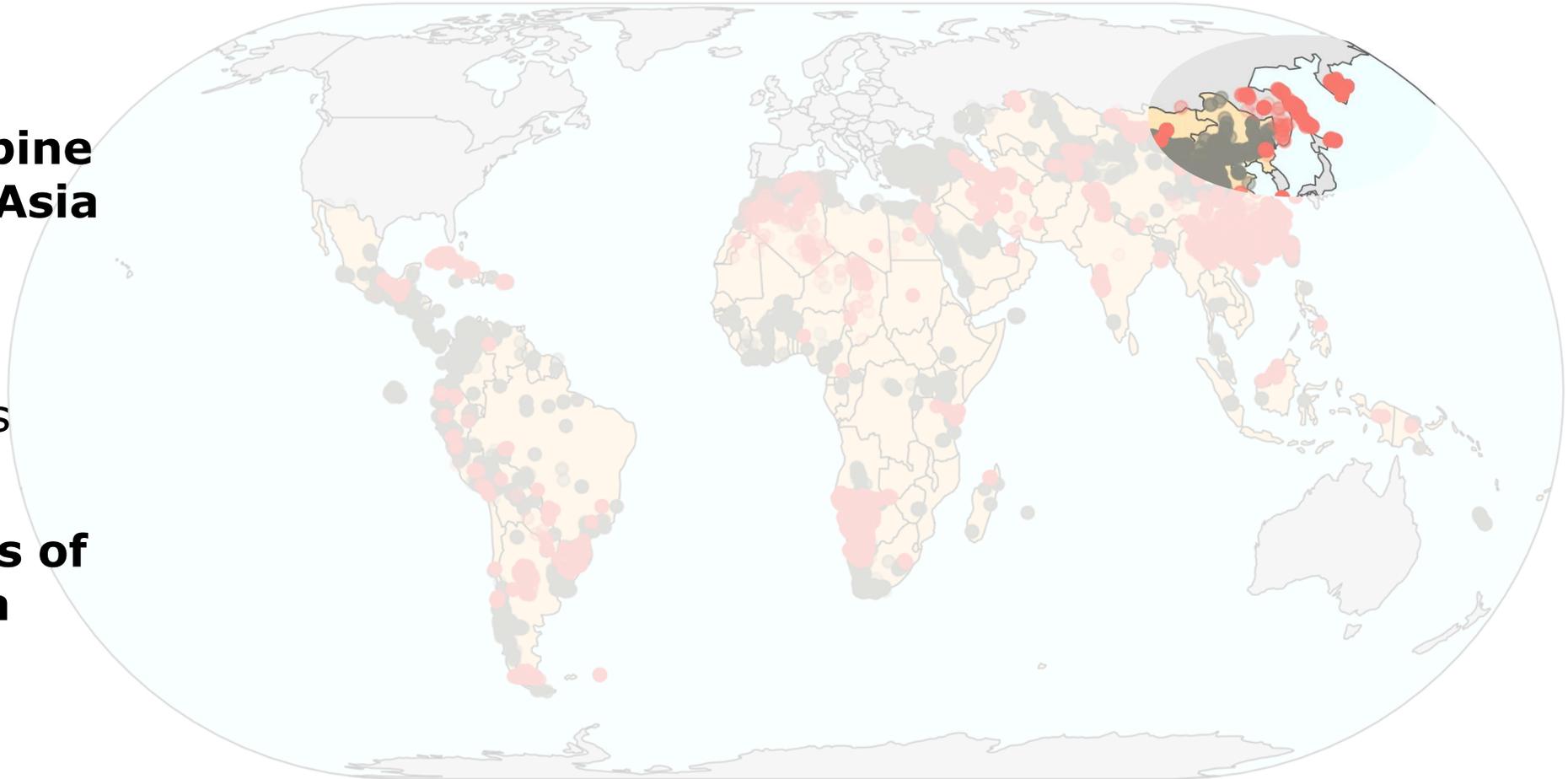
# (Inter)National aggregators

**GRASSPLOT**

Jürgen Dengler
Idoia Biurrun

2,326 new plots (outside EU)

**Iran**

Alireza Naqinezhad
Jalil Noroozi
Parastoo Mahdavi
Soghra Ramzi

7,573 new plots

**GLOBALP**

Riccardo Testolini
Borja Jiménez-Alfaro

2,796 new plots

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# Time-series data

- 280,553 observations
- 85,296 plots
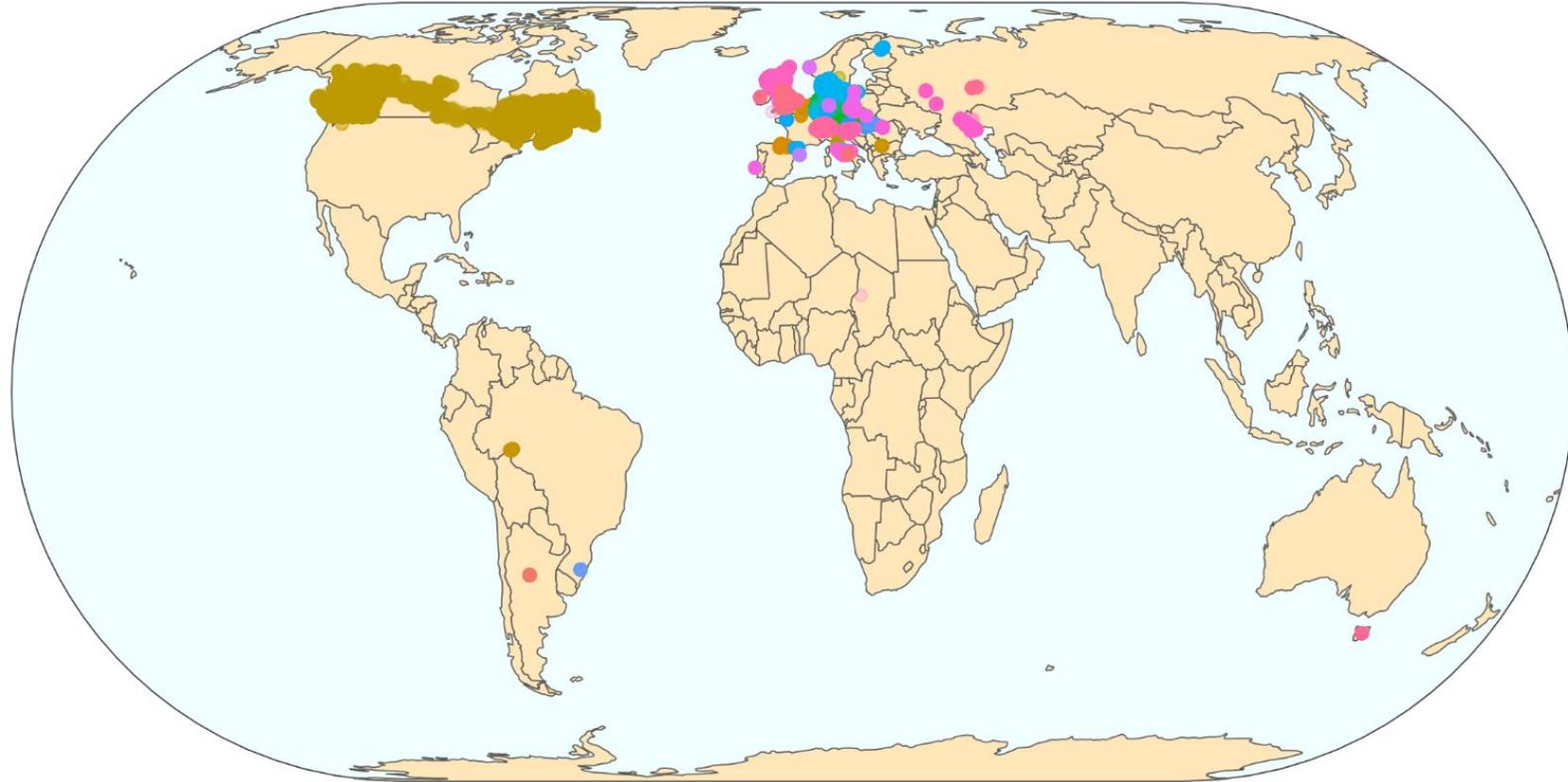
# Time-series data

- 280,553 observations
- 85,296 plots

- Europe: 211,130

  – North America: 68,925
    - Canada

  – Oceania: 95
    - Tasmania

  – Global South: 604
    - Brazil: 394
    - Argentina: 210

# Time-series data
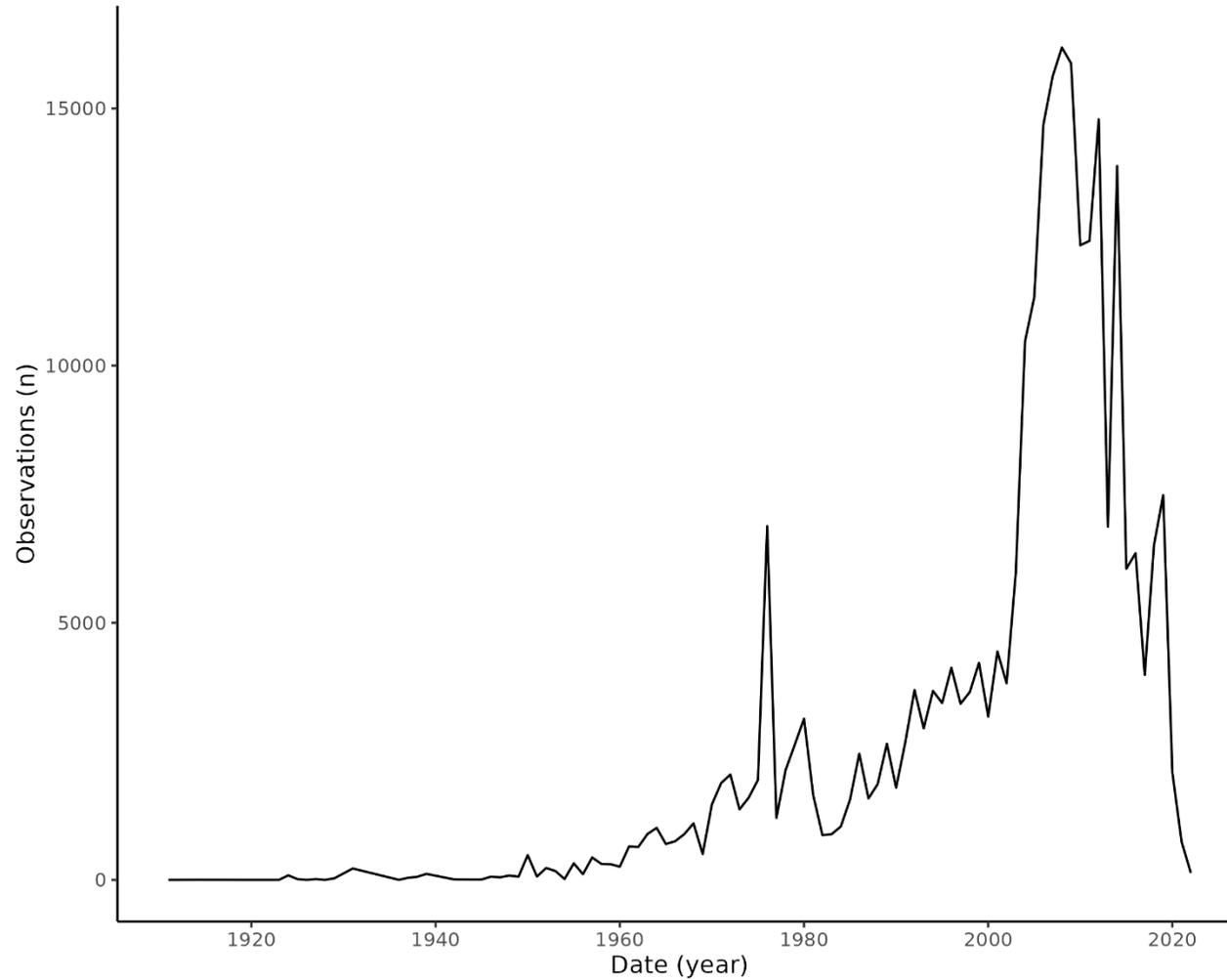
# Time-series data
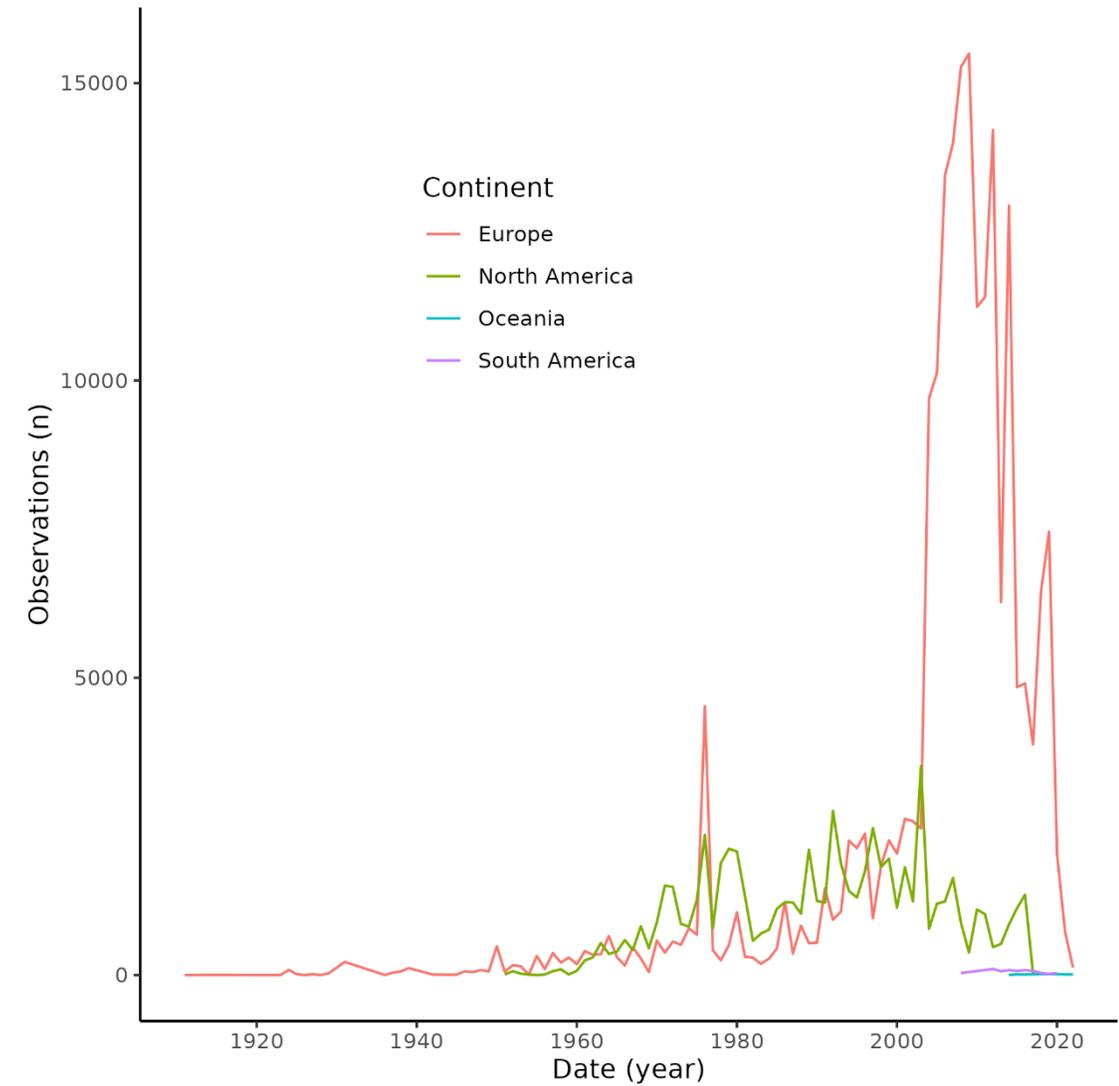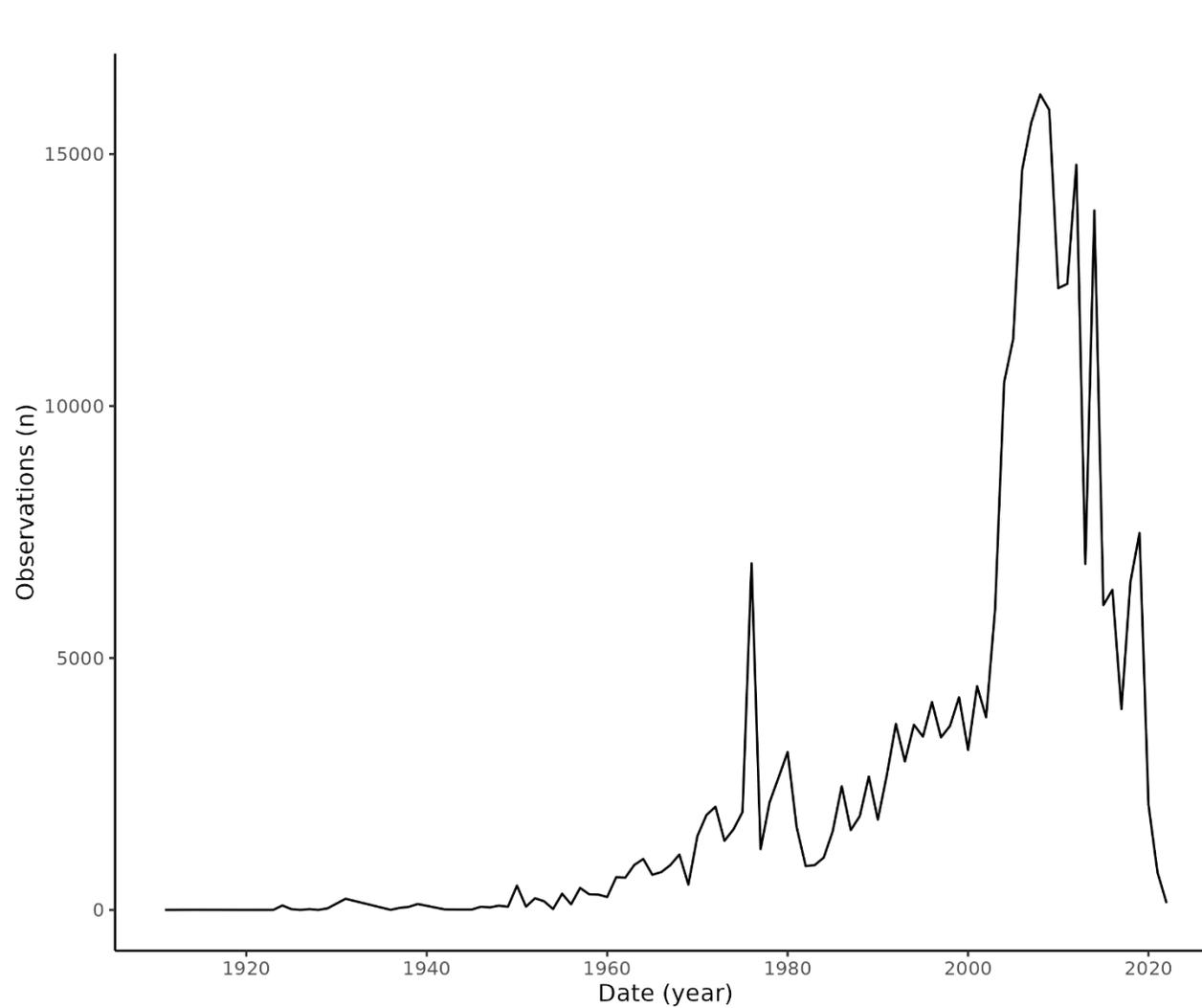
# Time-series data
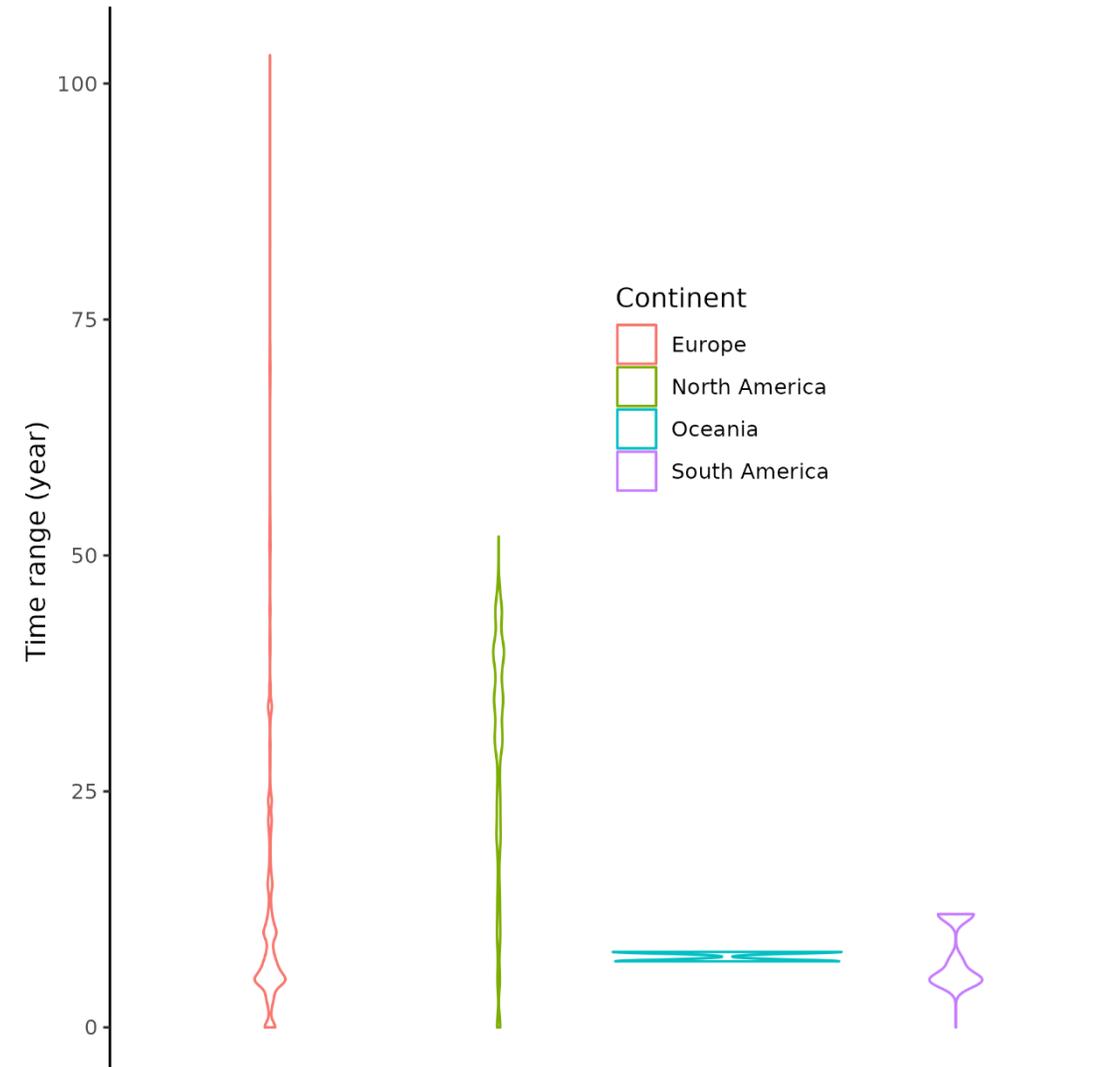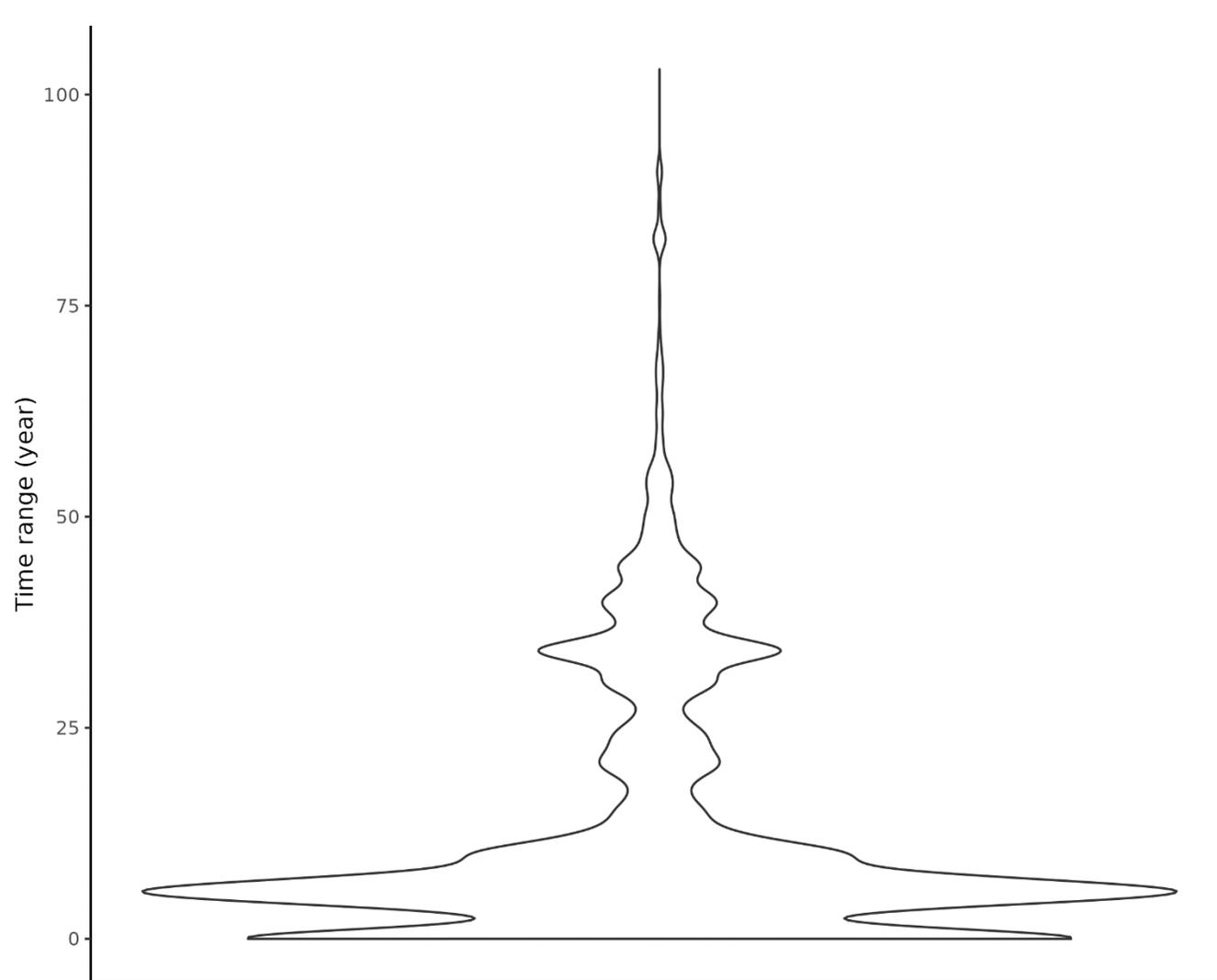
# Ecoregions

# Ecoregions

- 518 (61% of 857)

- 62 new (increase of 13%)

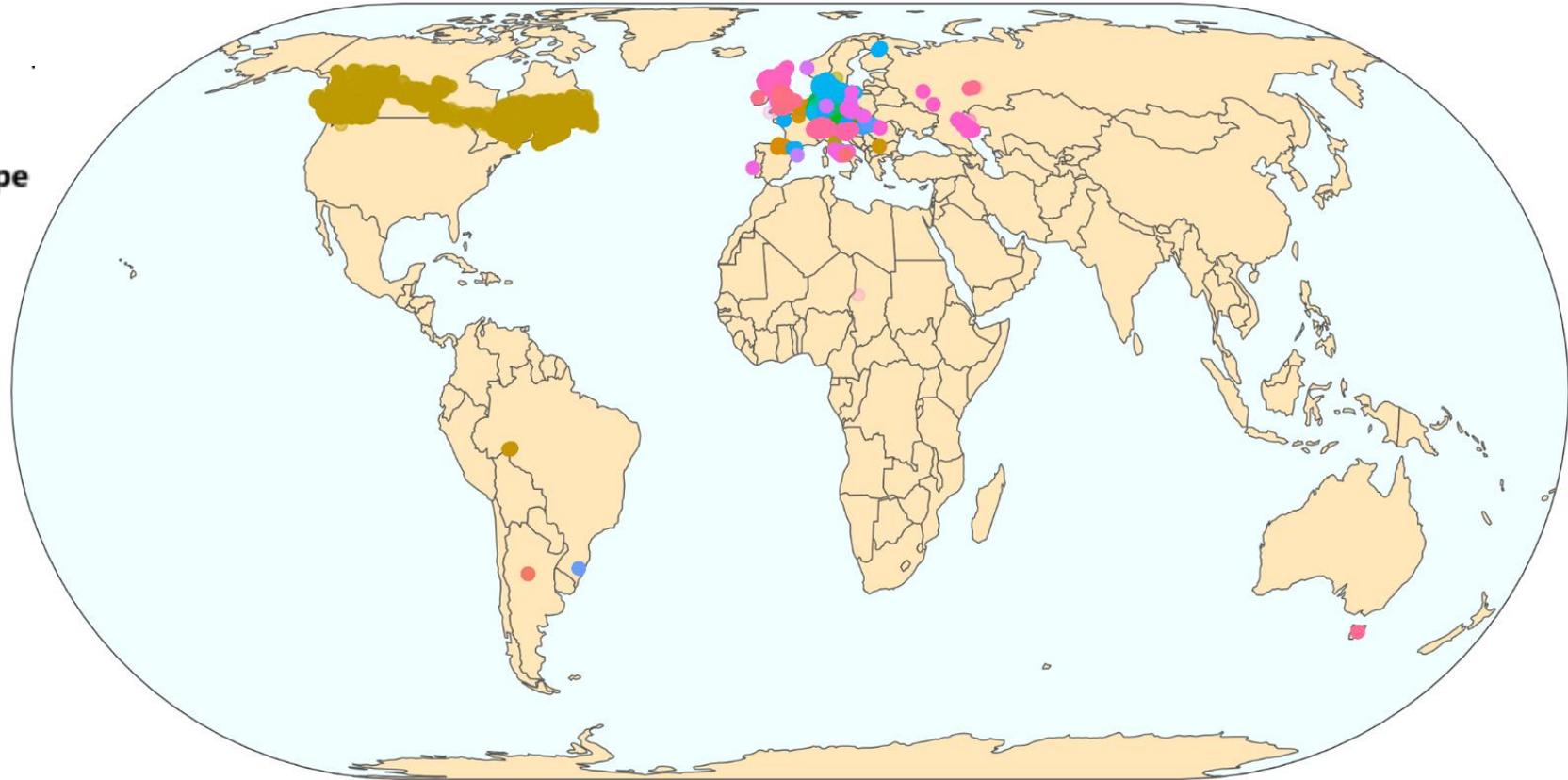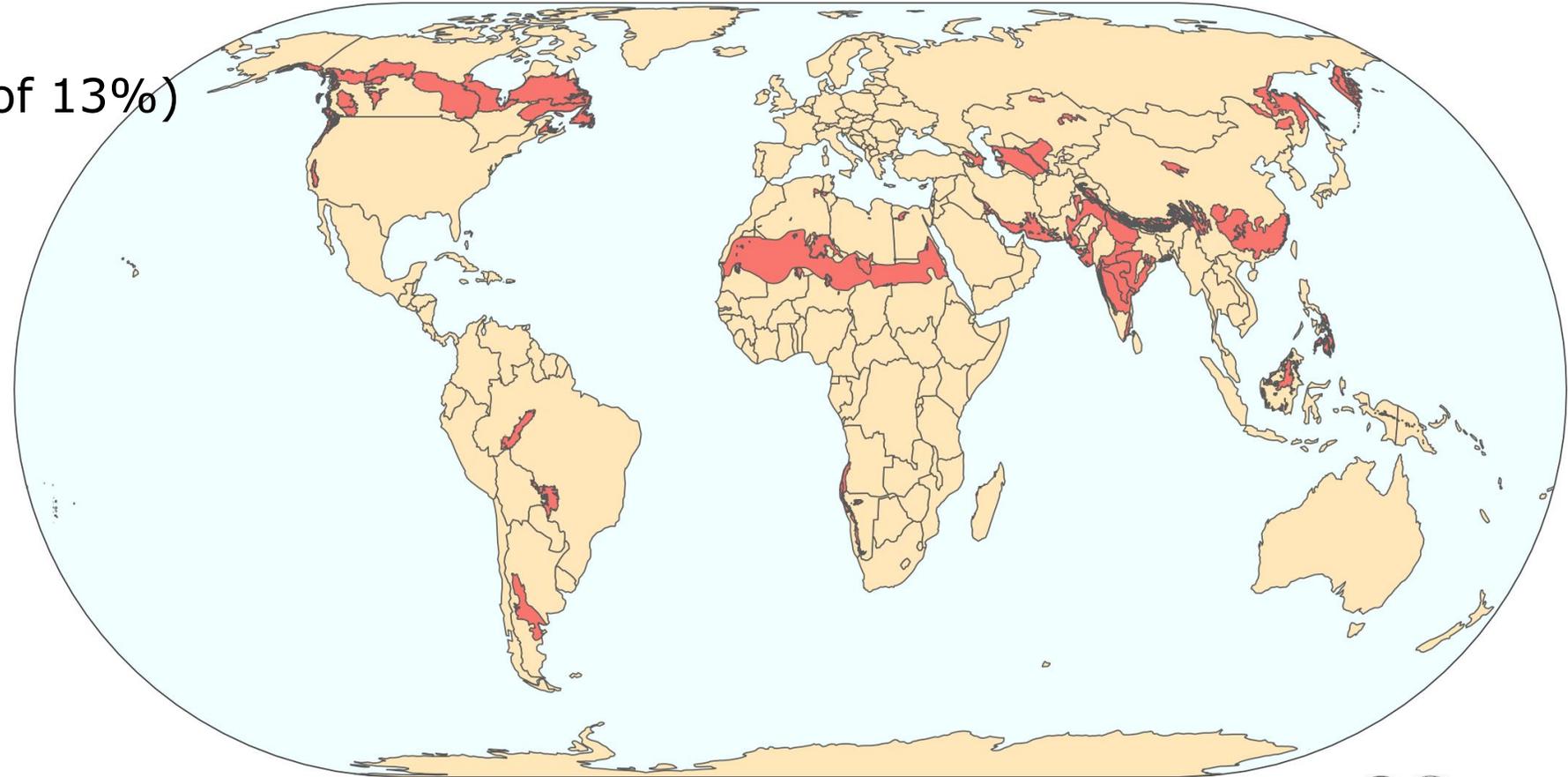# Ecoregions

- Pantanal

- Borneo peat swamp forests

- Namibian savanna woodlands

- Eastern Himalayan alpine shrub and meadows

- Eastern Canadian forests
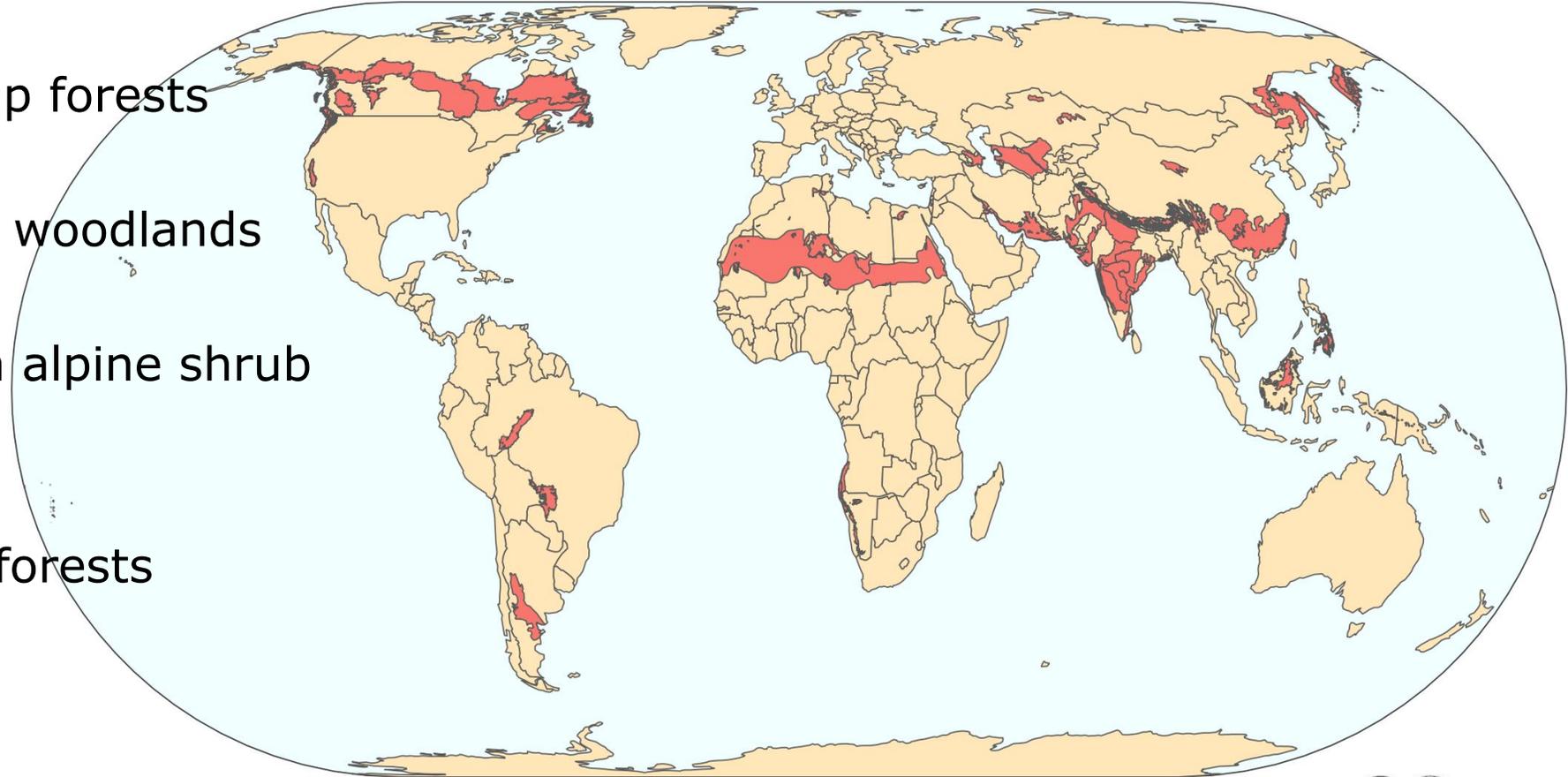
| Biome | Ecozones |
|---|---|
| Boreal Forests/Taiga | 10 |
| Deserts & Xeric Shrublands | 10 |
| Flooded Grasslands & Savannas | 4 |
| Mangroves | 2 |
| Montane Grasslands & Shrublands | 3 |
| Temperate Broadleaf & Mixed Forests | 3 |
| Temperate Conifer Forests | 11 |
| Temperate Grasslands, Savannas & Shrublands | 3 |
| Tropical & Subtropical Coniferous Forests | 1 |
| Tropical & Subtropical Dry Broadleaf Forests | 3 |
| Tropical & Subtropical Moist Broadleaf Forests | 10 |
| Tundra | 2 |

Mediterranean Forests, Woodlands & Scrub

# sPlot 4: plant species

- Total of 97,121 species after taxonomical harmonization (increase of 26%)

- 68,865 species with trait data from TRY 6.0

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# sPlot 4: plant species

• Total of 97,121 species after taxonomical harmonization (increase of 26%)

• 68,865 species with trait data from TRY 6.0

• Most recurrent species:

| Species | Family | Occurrences |
|---|---|---|
| *Festuca rubra* | Poaceae | 371,235 |
| *Holcus lanatus* | Poaceae | 317,769 |
| *Fagus sylvatica* | Fagaceae | 308,342 |
| *Dactylis glomerata* | Poaceae | 287,553 |
| *Plantago lanceolata* | Plantaginaceae | 278,516 |

# Vegetation classification

- World Formation Types

- Faber-Langendoen et al. 2016

- New data with formations informed by contributors

- Ad-hoc attribution to selected datasets in sPlot 3

- Cross-walk from EUNIS (European habitats)



USDA United States Department of Agriculture

**Classification and Description of World Formation Types**

Don Faber-Langendoen, Todd Keeler-Wolf, Del Meidinger, Carmen Josse, Alan Weakley, David Tart, Gonzalo Navarro, Bruce Hoagland, Serguei Ponomarenko, Gene Fults, Eileen Helmer

Forest Service    Rocky Mountain Research Station    General Technical Report RMRS-GTR-346    August 2016

# Vegetation classification

- 61% (1,565,953 plots) with information about vegetation formations
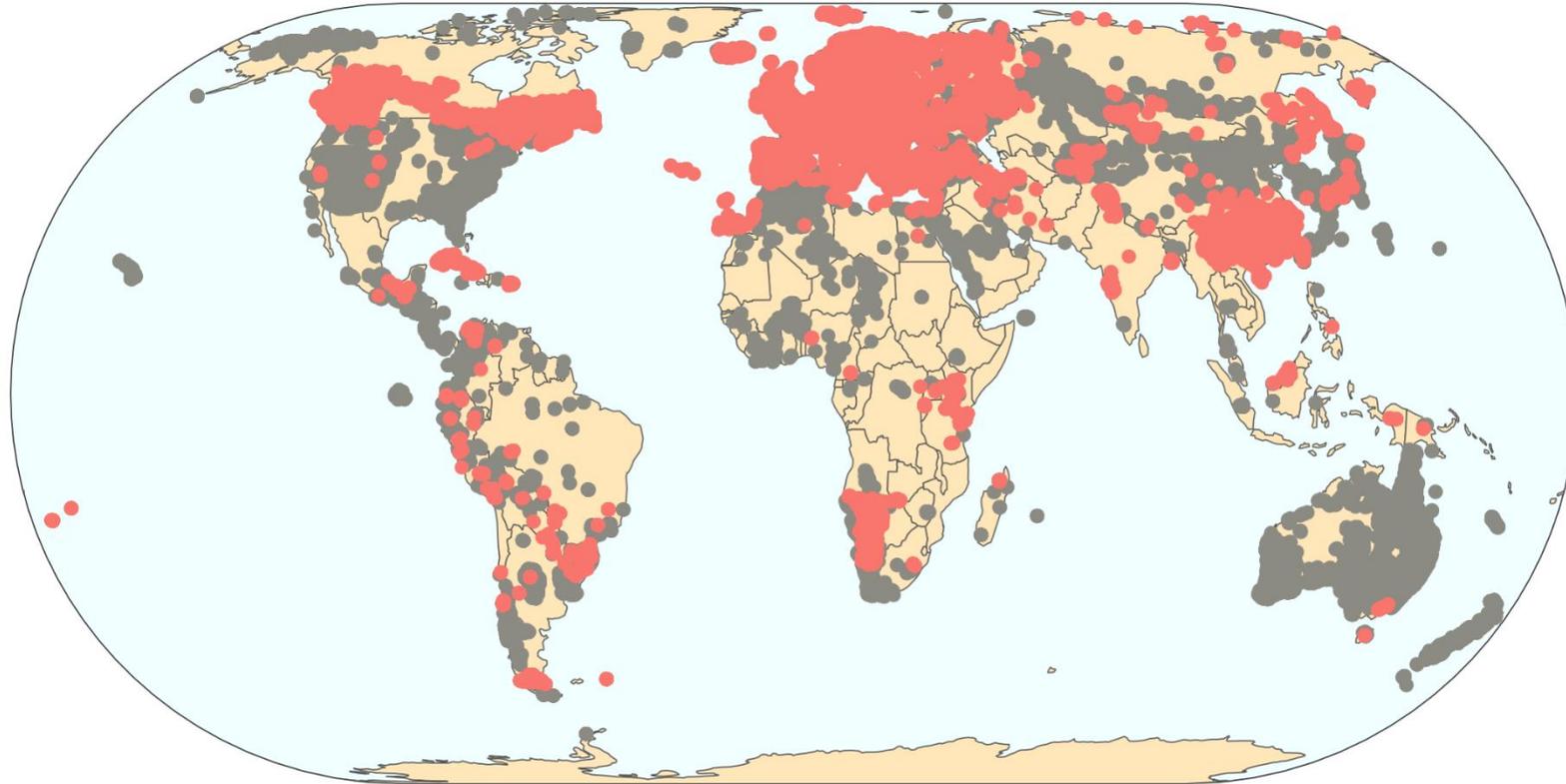
# Vegetation classification

Defining the world's formation types using the global vegetation database sPlot 4

Friday 8th September at 08:50

Session 14A: Biomes, vegetation mapping and classification

**Osprey room**

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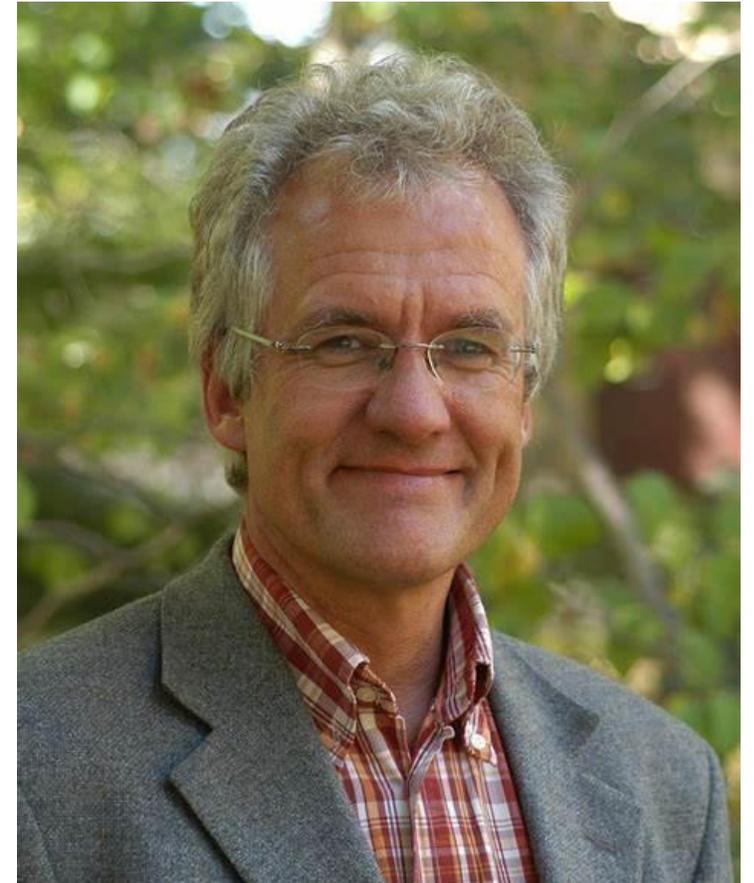MARTIN-LUTHER-UNIVERSITÄT
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# Vegetation classification

Defining the world's formation types using the global vegetation database sPlot 4

Friday 8th September at 08:50

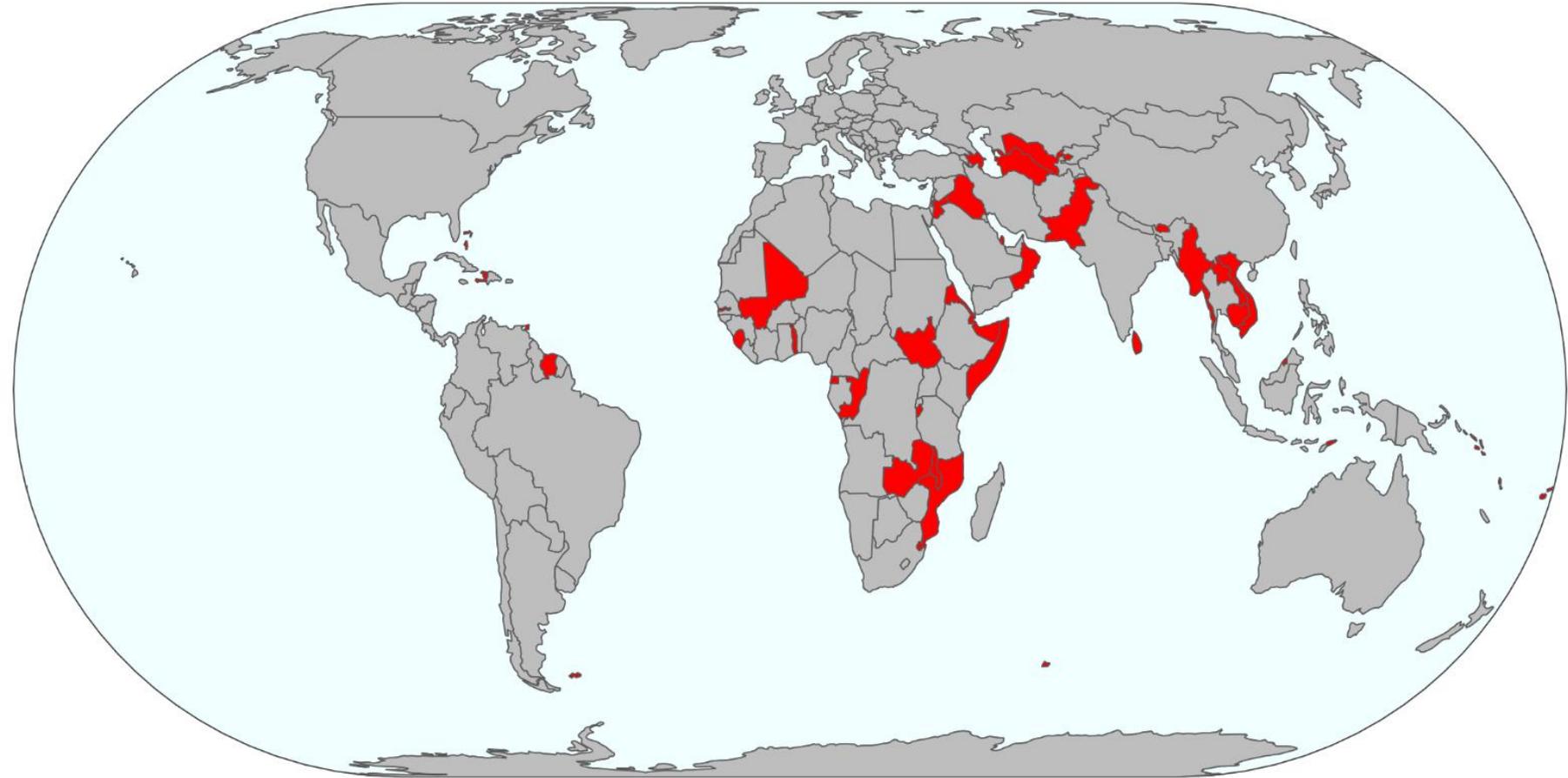Session 14A: Biomes, vegetation mapping and classification
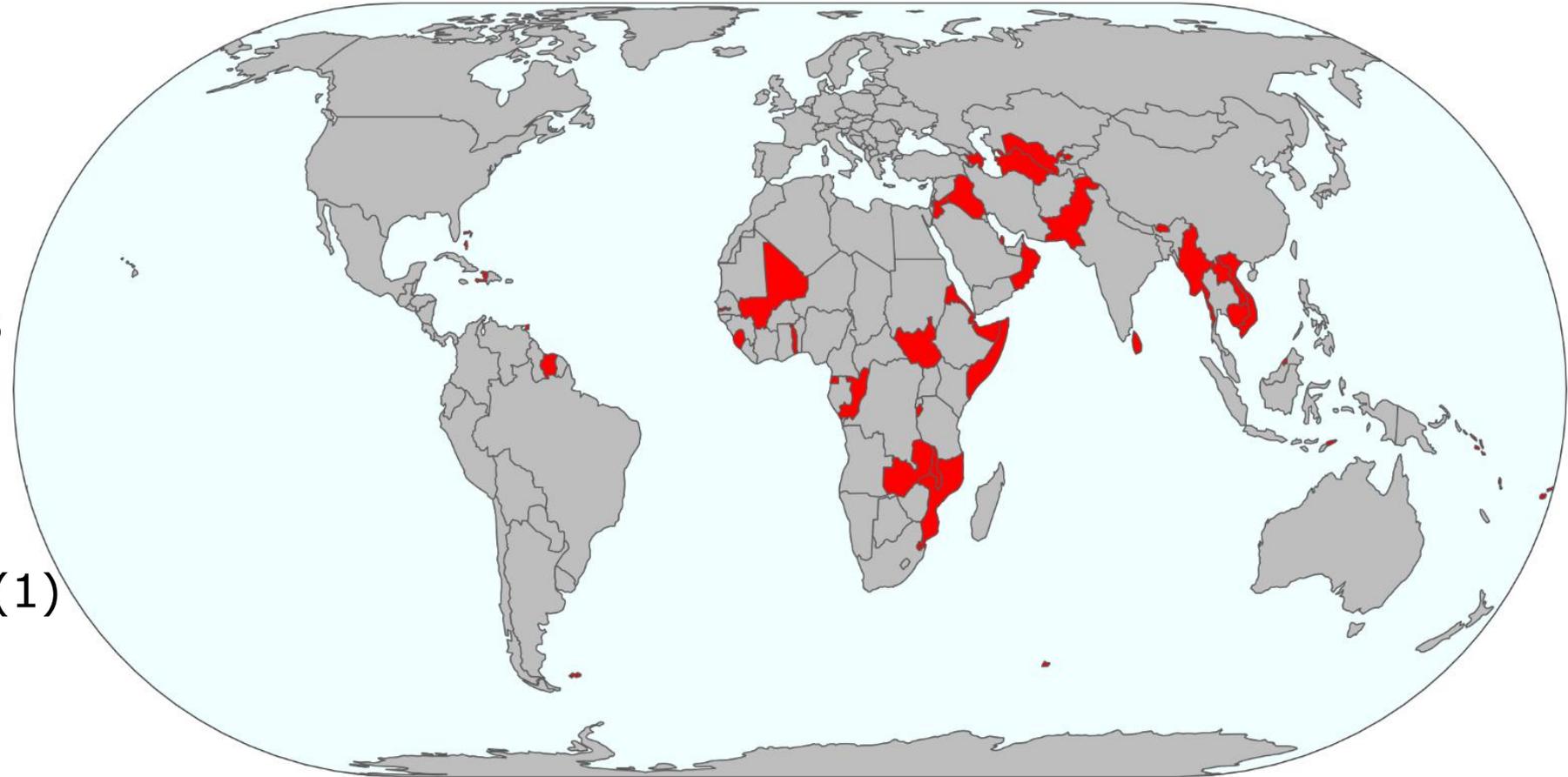
**Osprey room**

SPOILER ALERT!

99% of plots classified!

# Where we can do better
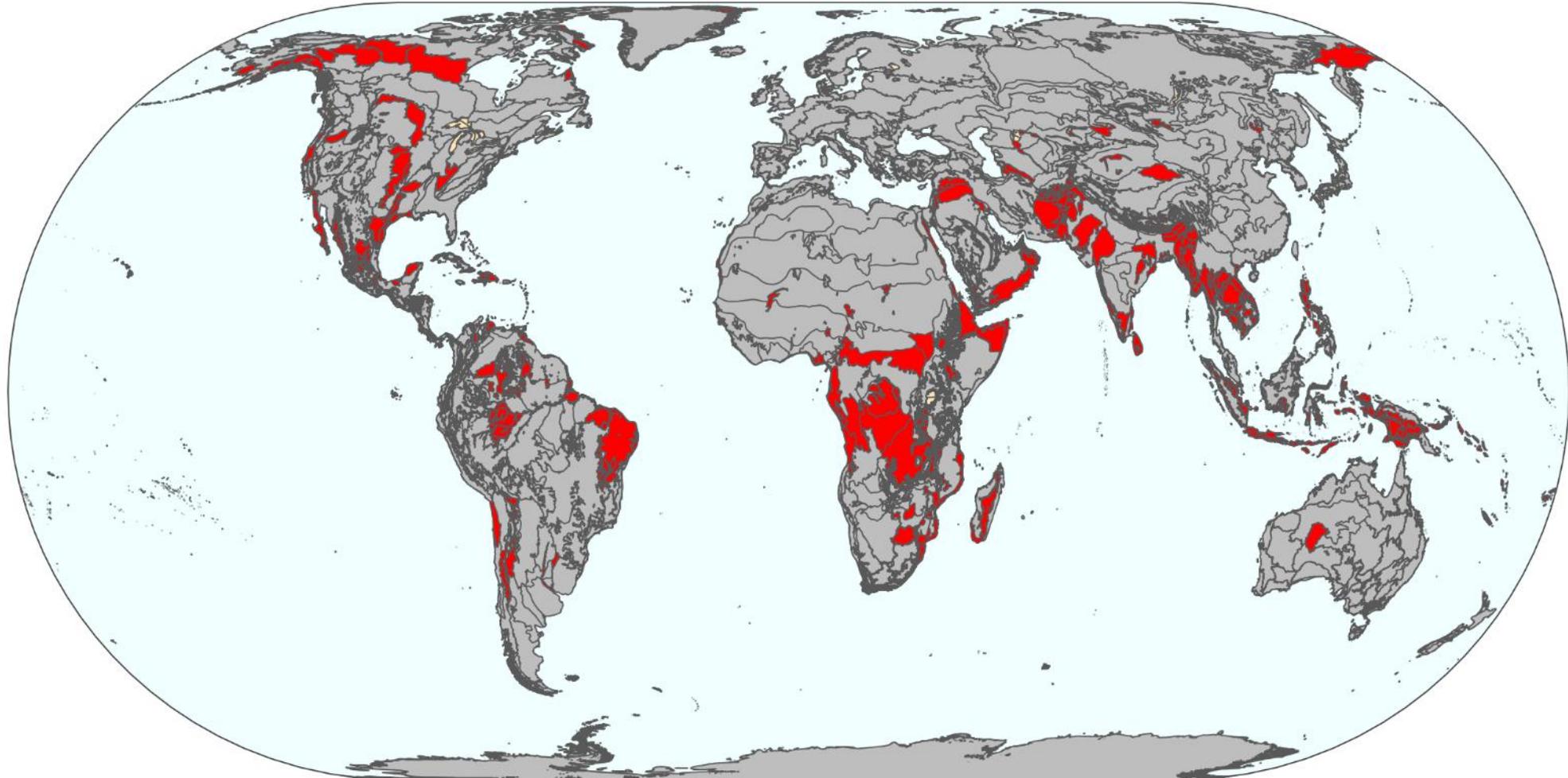


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# Where we can do better

- Africa: 12

- Asia: 16

- Central America: 3

- Oceania: 3

- South America: 1 (1)



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# Where we can do better

# Continuous effort for increasing representativeness!

- Community-level data (plots)

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# Continuous effort for increasing representativeness!

- Community-level data (plots)

- Required data:
  – Dozens of plots
  – Georeferenced plots
  – Species identification
  – Abundance data

**Please spread the call!**

www.idiv.de/en/splot

@sPlot-iDiv

gabriella.damasceno@idiv.de

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