



Lessons From Publishing: Do Researchers in Developing Countries Receive Credit for Their Work?

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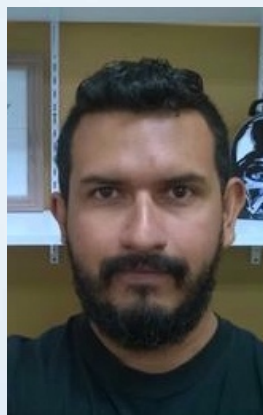
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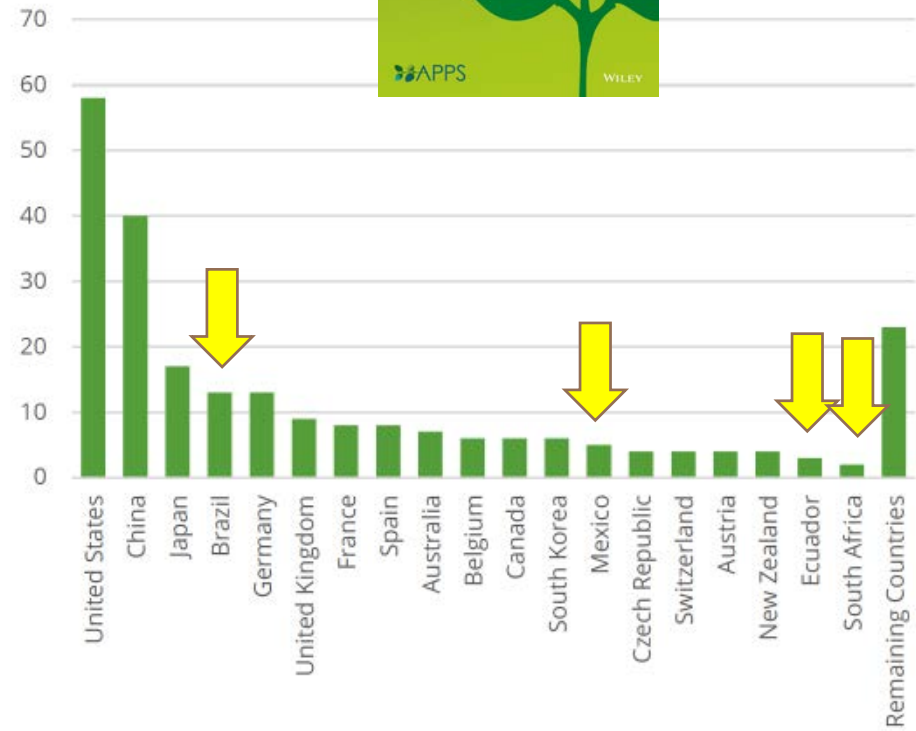
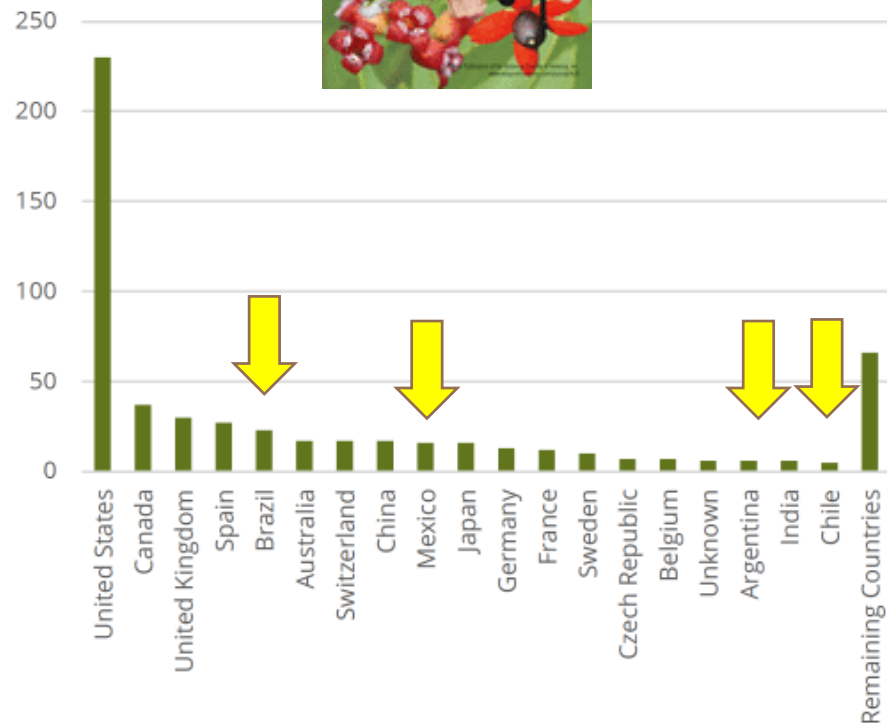
Zhaowei
Ren

Steps to Publishing



1. Identify your research question
2. Conduct your research project – gather data & analyze
3. Write up your manuscript
4. Submit to a peer-reviewed journal
5. Wait for the review feedback
6. Revise or resubmit
7. Publication!!

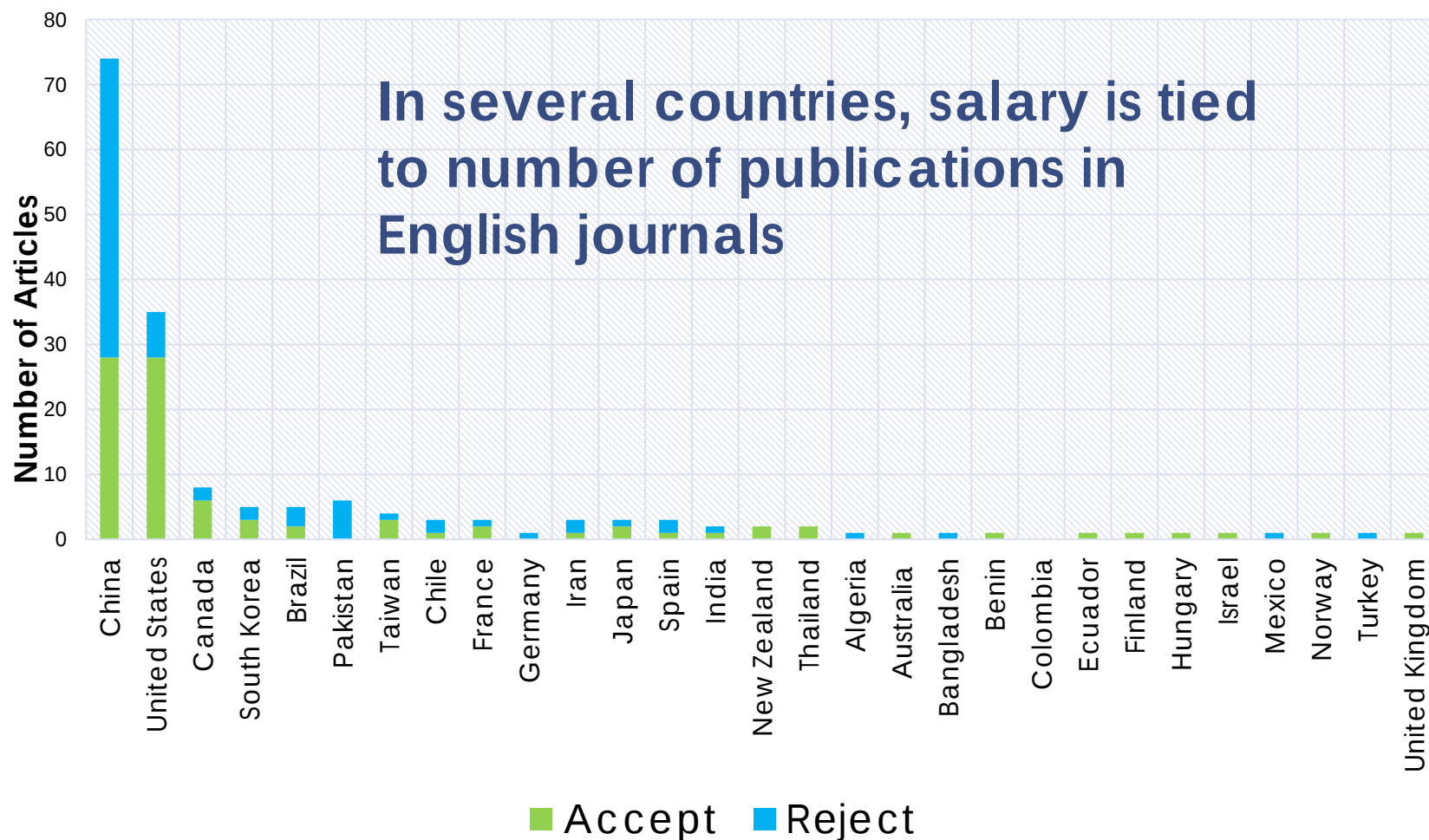
Number of Published Articles by Country - 2017



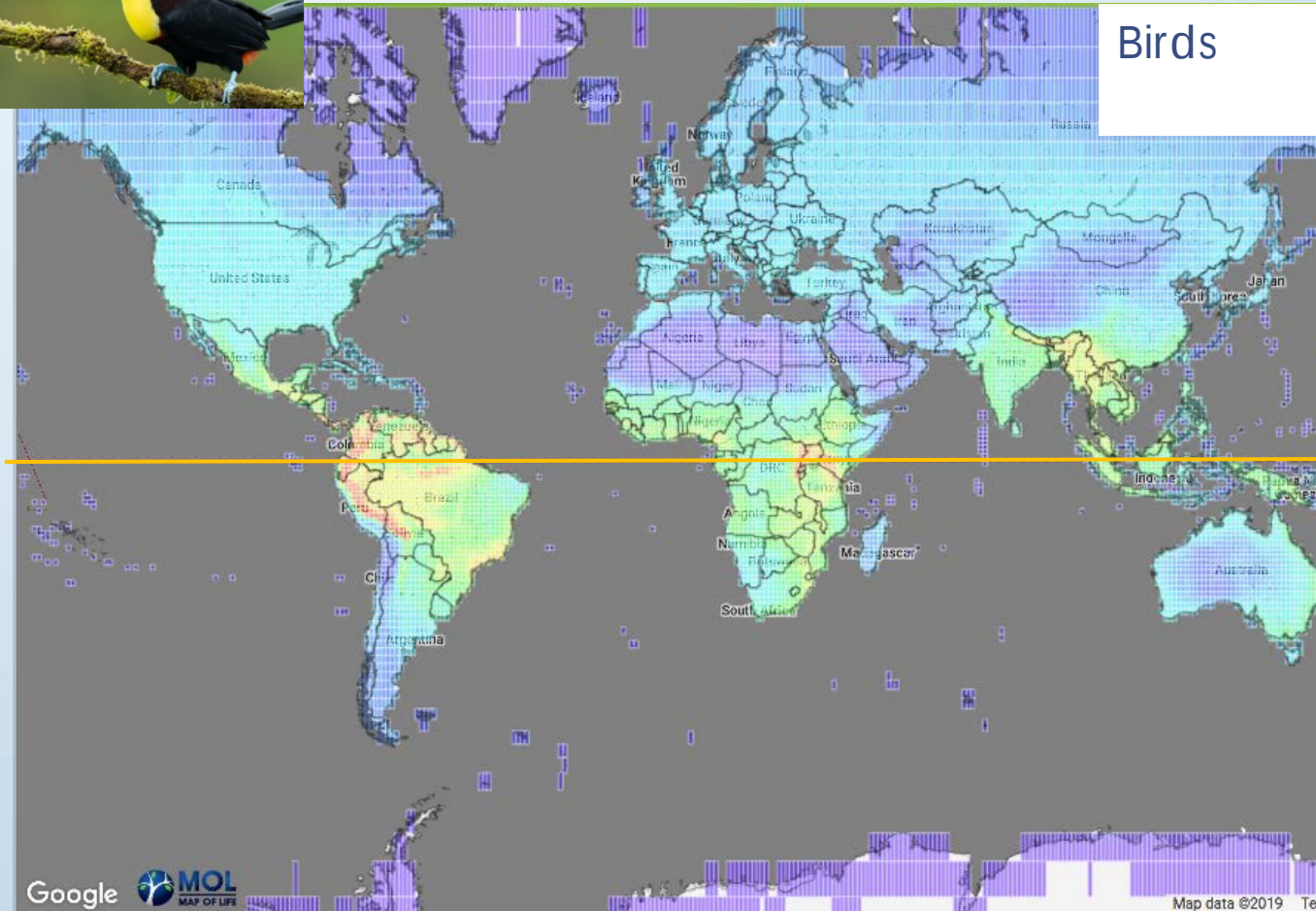
* Determined by country of corresponding author



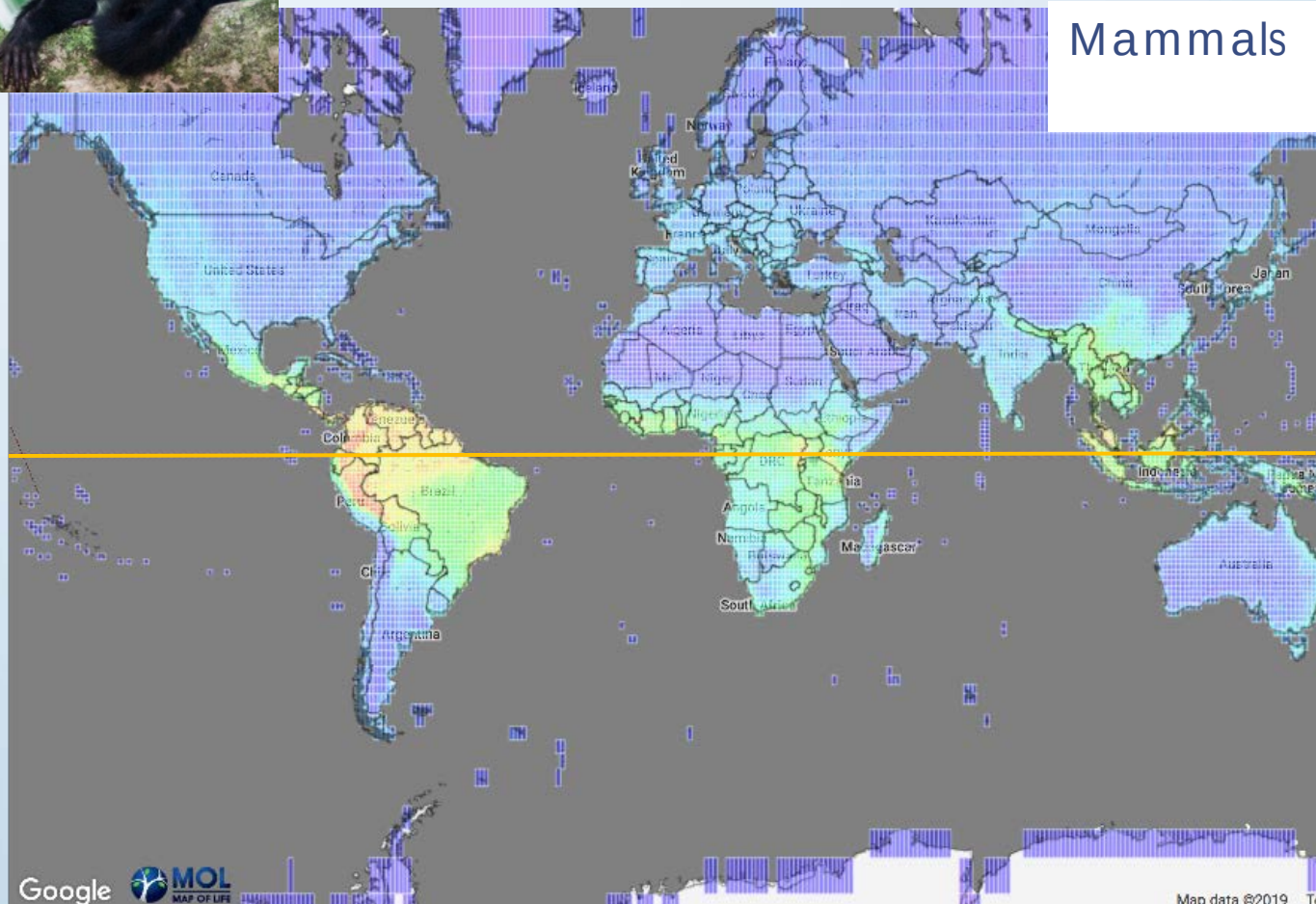
2018: Submissions received from 29 countries



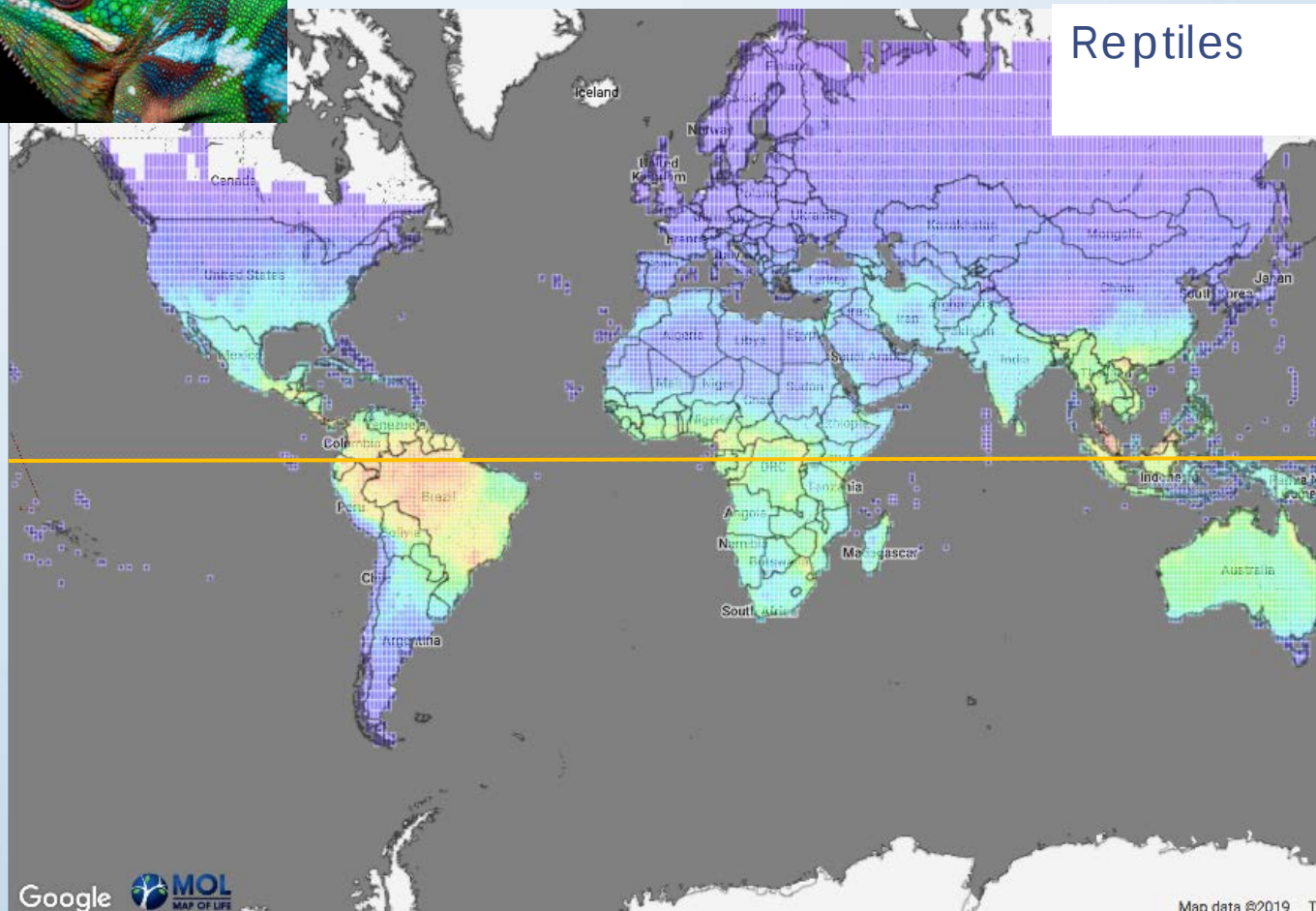
Species Richness = Number of Species



Species Richness = Number of Species



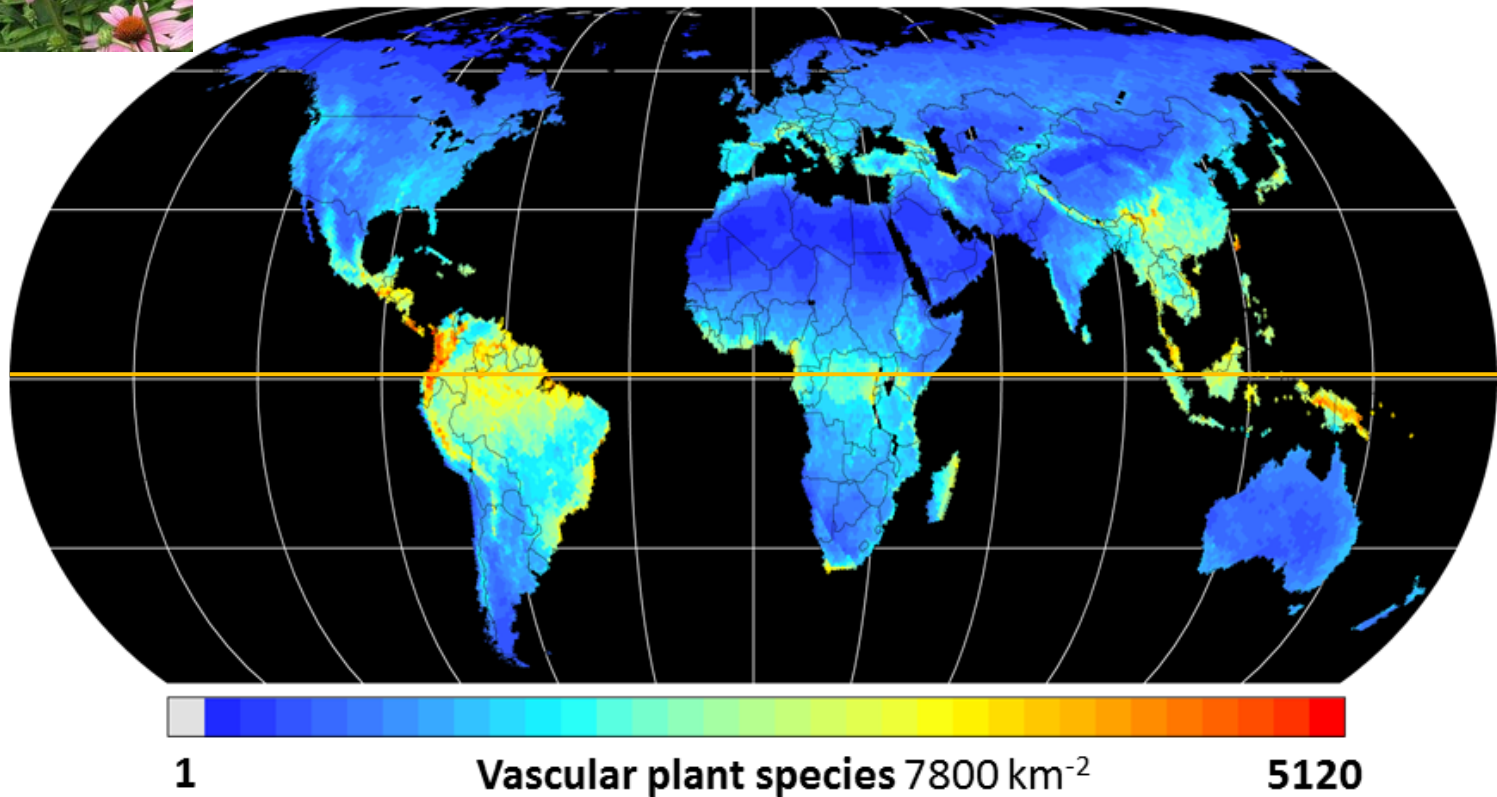
Species Richness = Number of Species



Species Richness = Number of Species



Native Species (N)

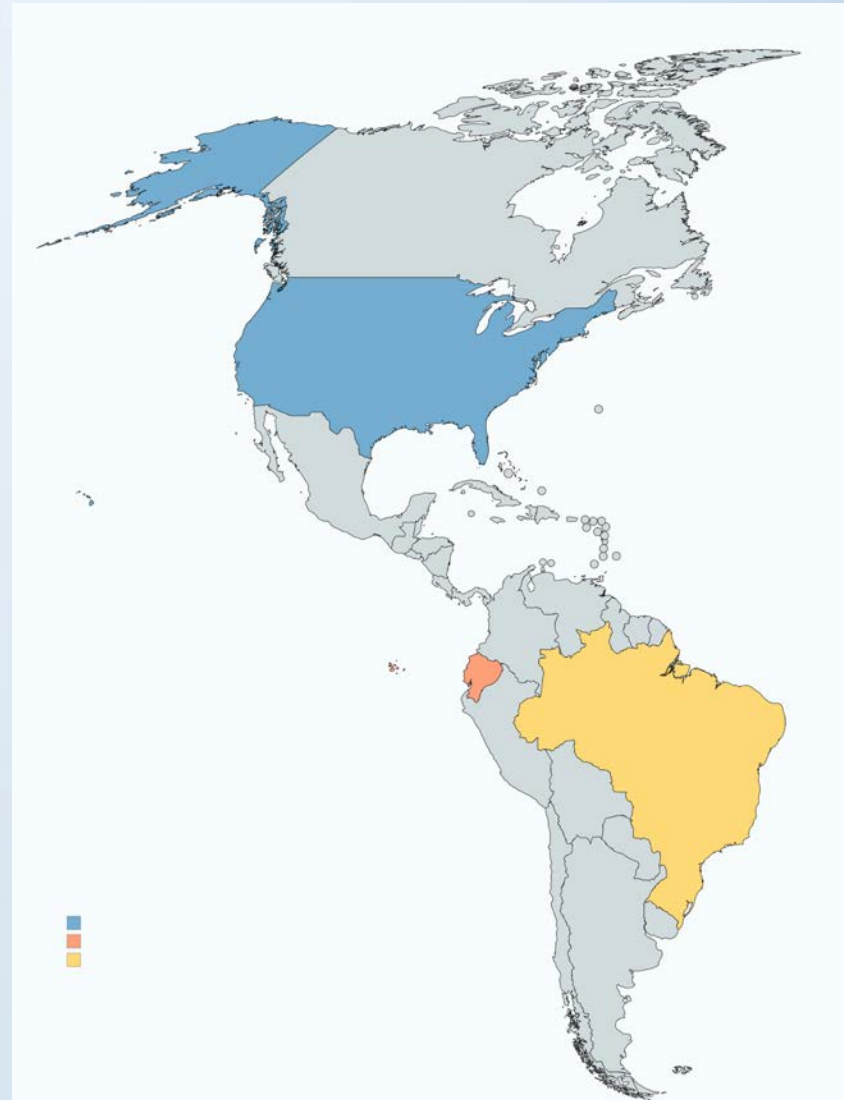


After: Kreft H, Jetz W. 2007. Global patterns and determinants of vascular plant diversity. *PNAS*, **104**:5925–5930.

Plant Species Richness

- Greatest in tropical areas!

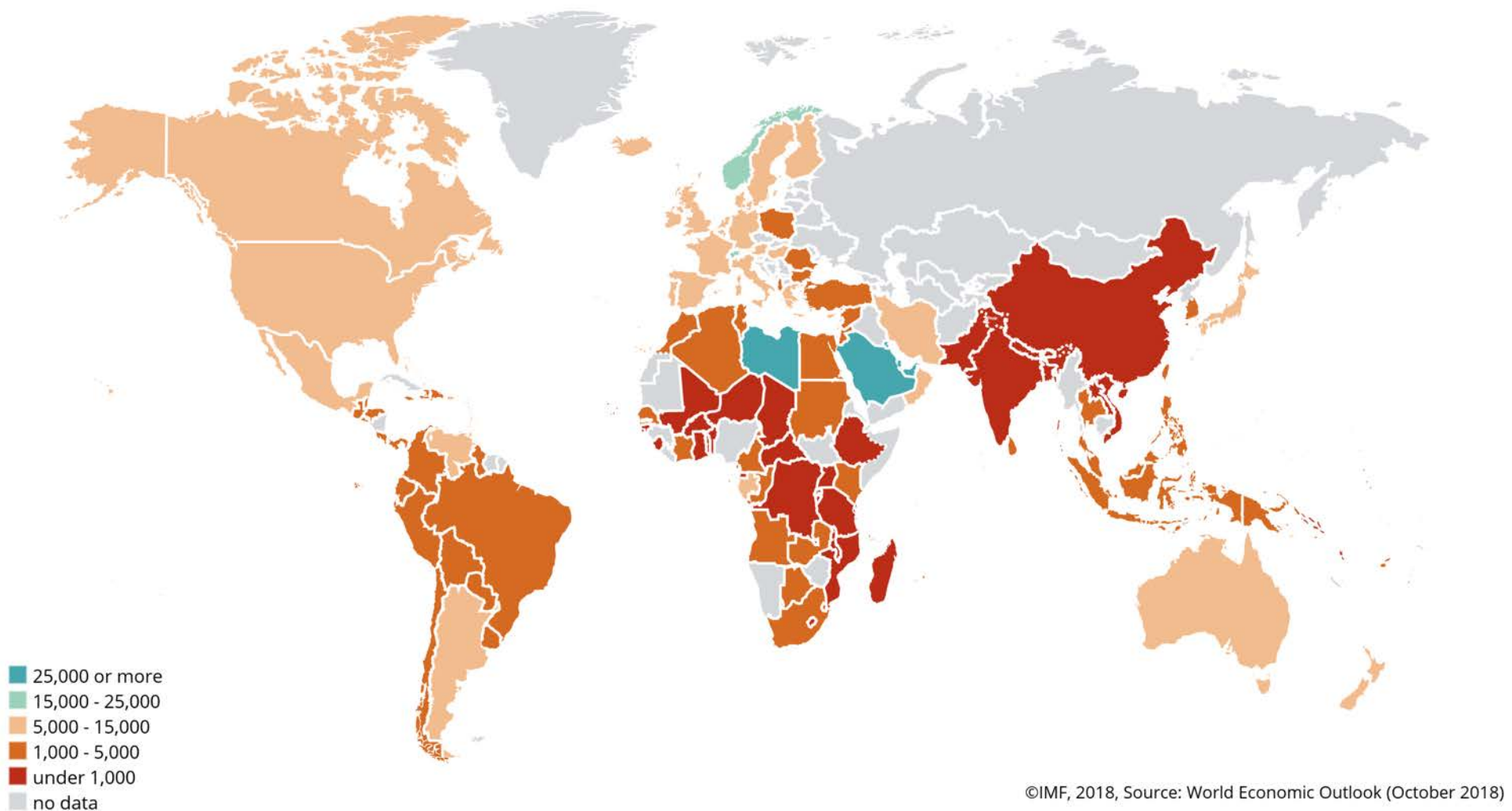
Country	Area (km ²)	R
United States	9,156,793	462
Brazil	8,358,140	521
Ecuador	262,21	1856



The world regions of **highest biodiversity** are also usually those with the **lowest economic resources**

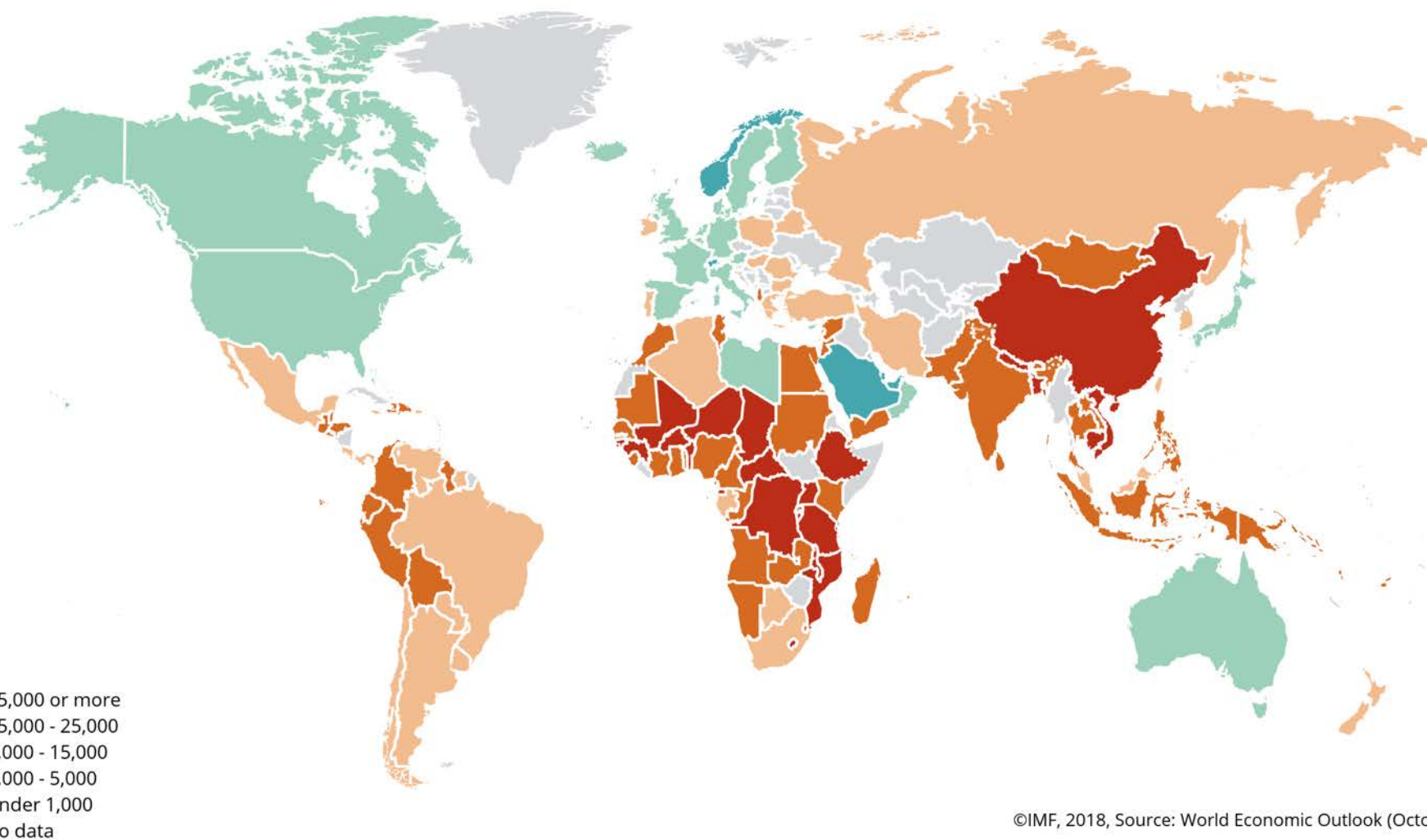
Global Gross Domestic Product Per Capita

IMF DataMapper GDP per capita, current prices (Purchasing power parity; international dollars per capita, 1980)



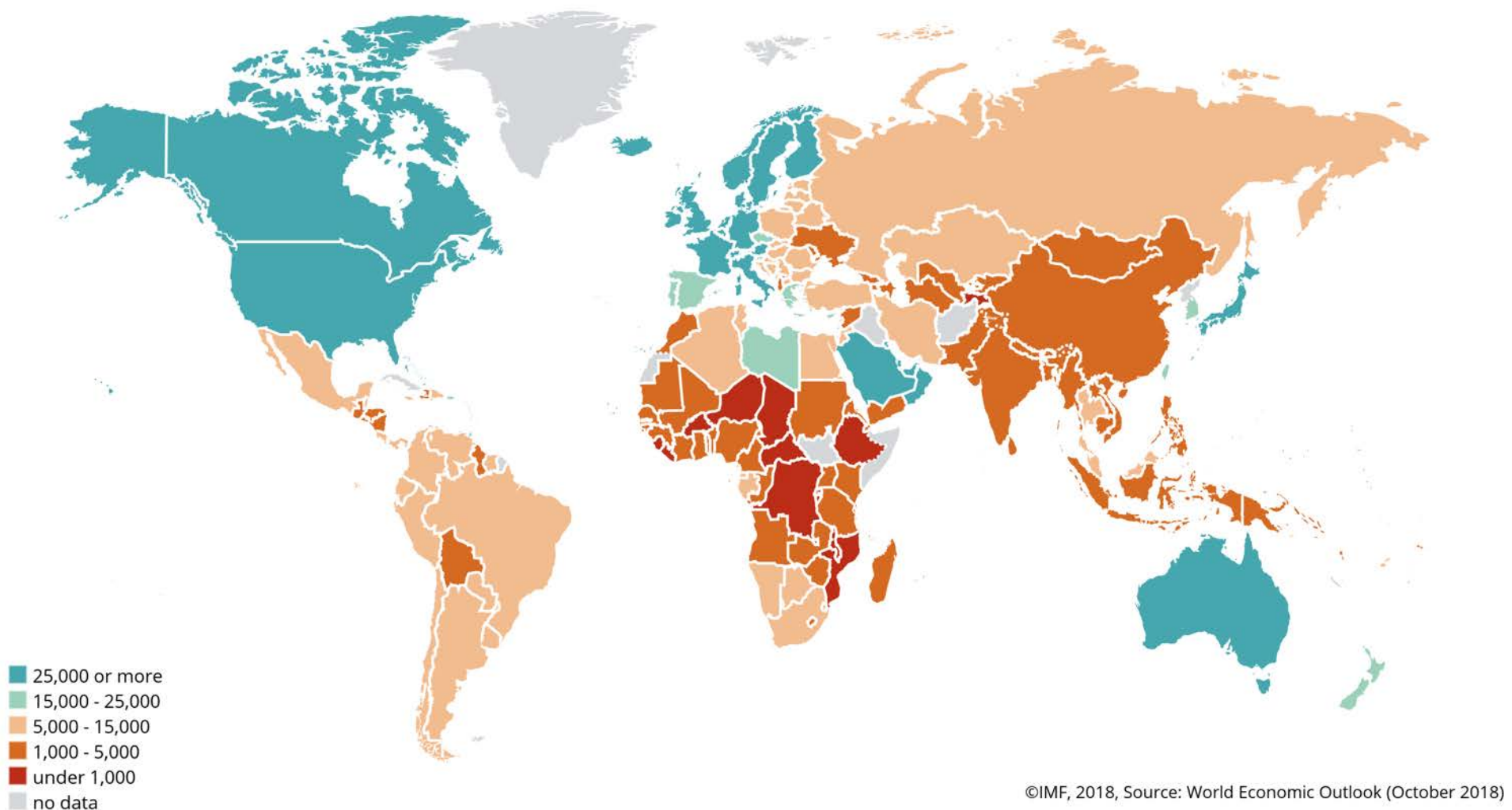
Global Gross Domestic Product Per Capita

IMF DataMapper GDP per capita, current prices (Purchasing power parity; international dollars per capita, 1990)



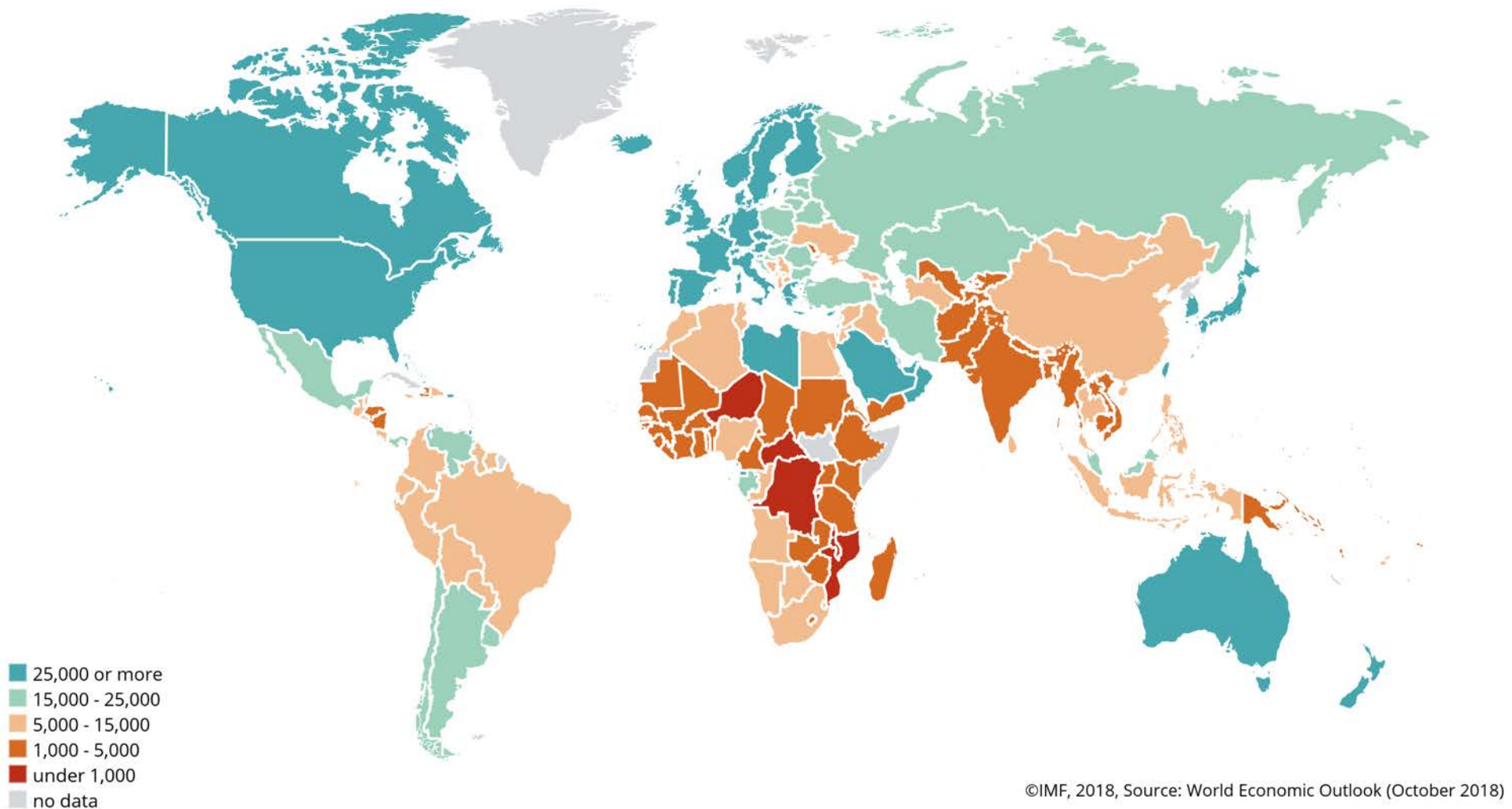
Global Gross Domestic Product Per Capita

IMF DataMapper GDP per capita, current prices (Purchasing power parity; international dollars per capita, 2000)



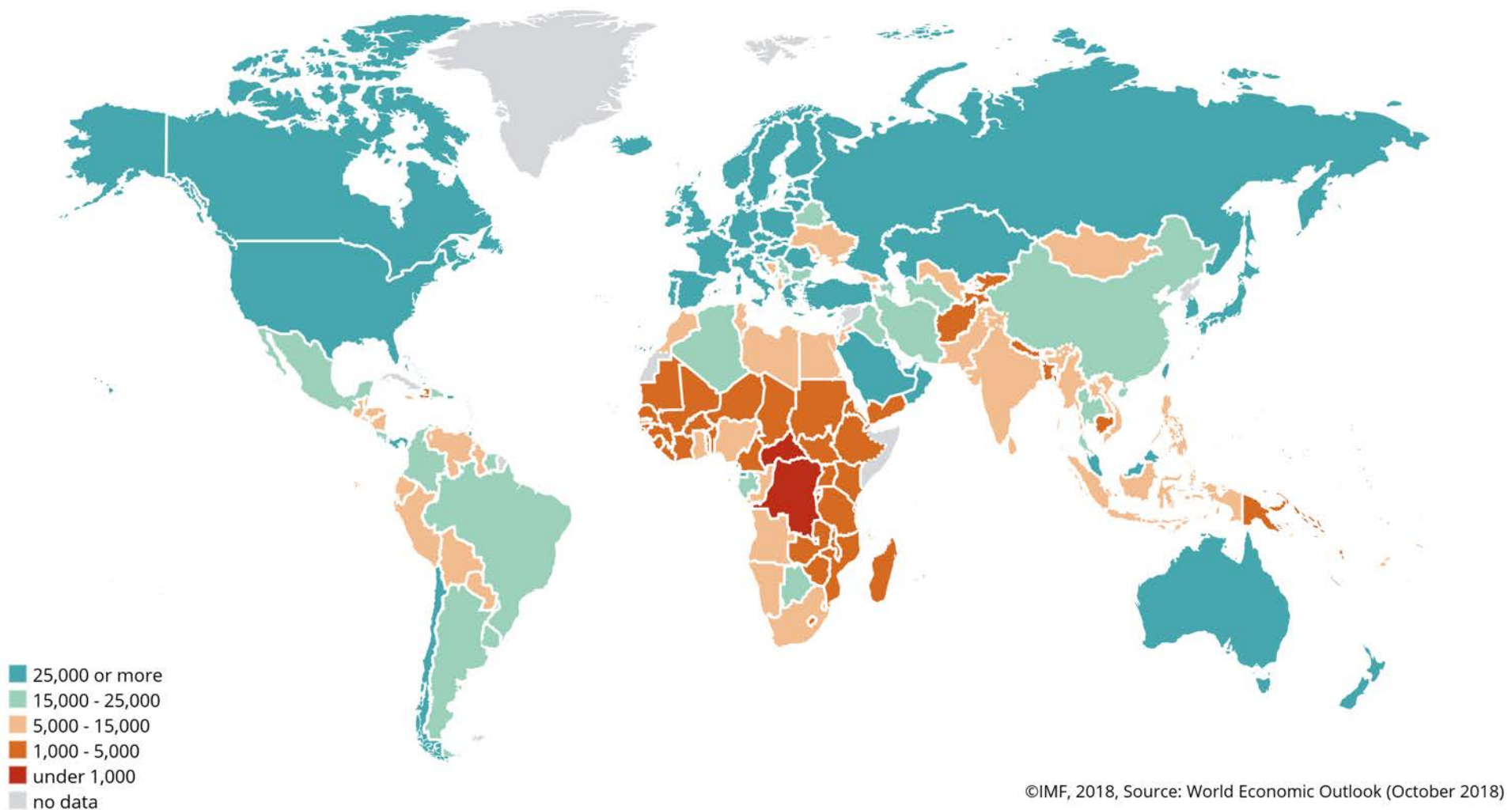
Global Gross Domestic Product Per Capita

IMF DataMapper GDP per capita, current prices (Purchasing power parity; international dollars per capita, 2010)



Global Gross Domestic Product Per Capita

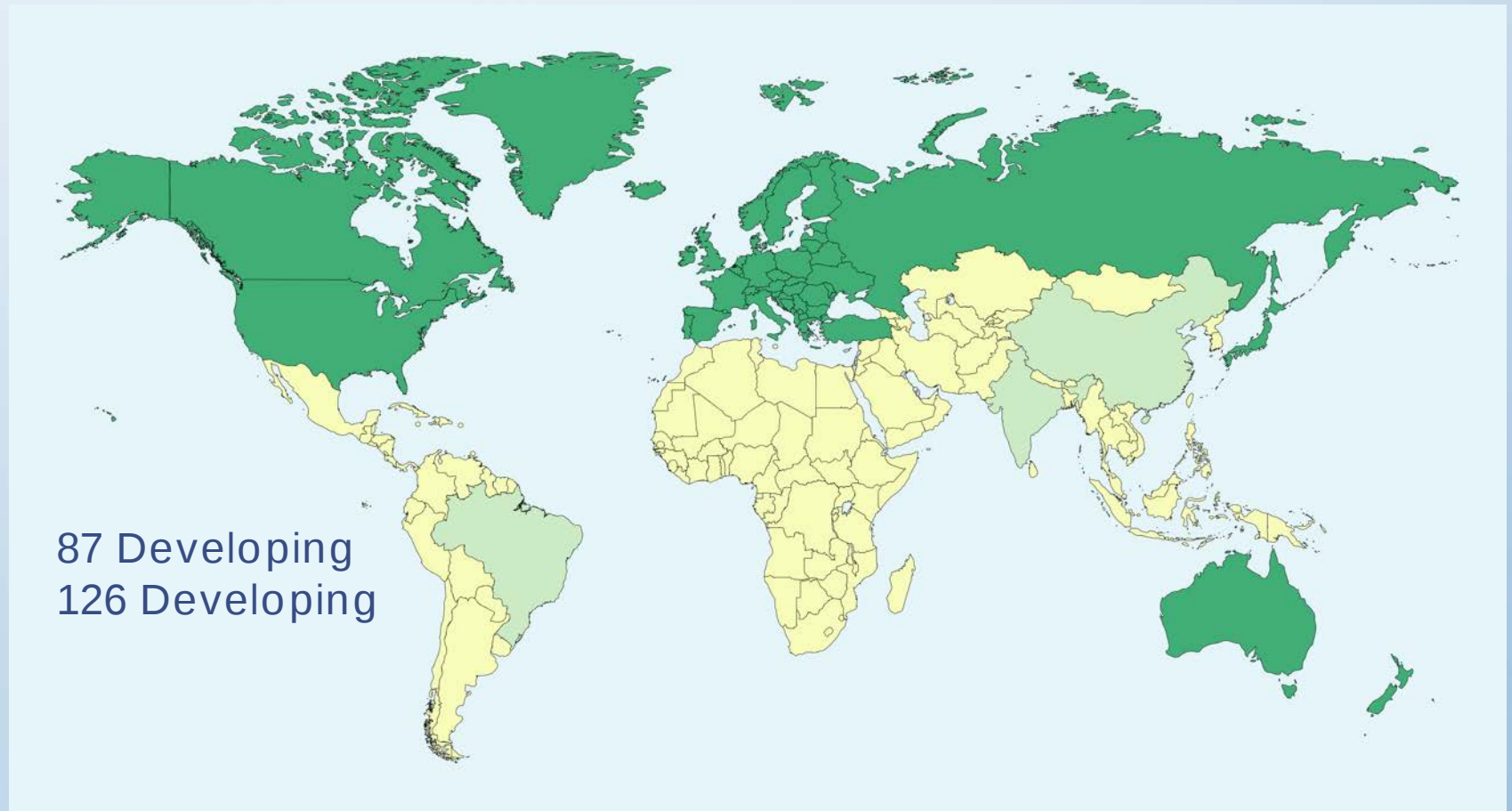
IMF DataMapper GDP per capita, current prices (Purchasing power parity; international dollars per capita, 2019)



Developed vs. Developing Countries

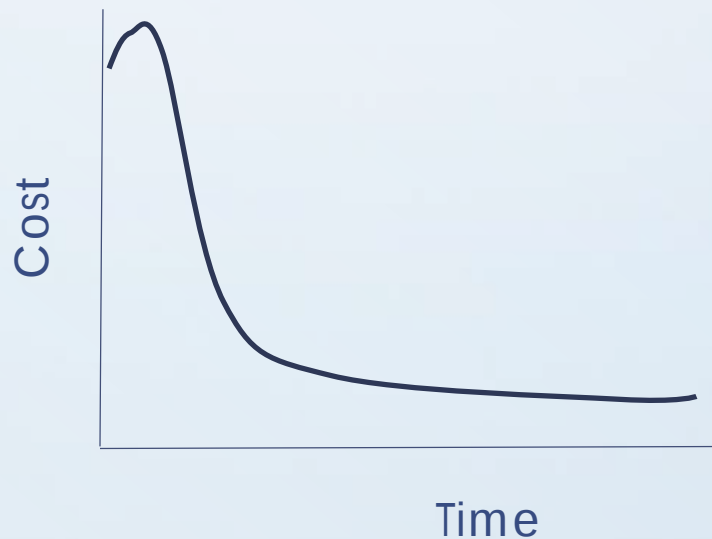
213 Countries identified into these categories

- Originally based on CIA criteria
- Now based on UN, World Bank, and International Monetary Fund



Challenges Often Experienced by Authors from Developing Countries:

- Lack of fluency in English (or perceived as such)
- Reported difficulty in getting work published
- Limited access to many modern genetic methods



New:

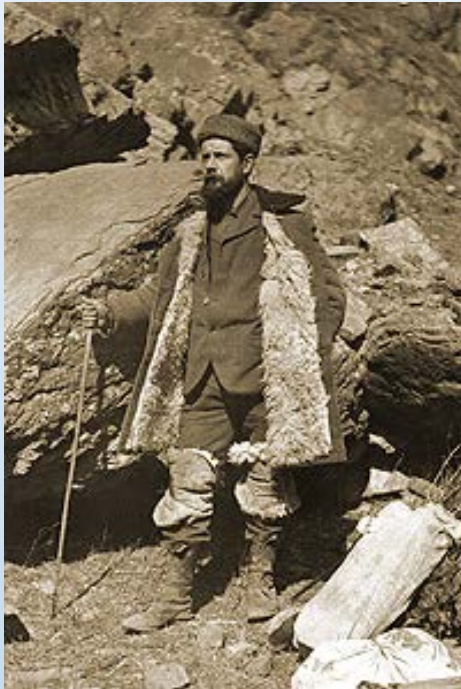
Next-Gen Sequencing
SNPs
Microsatellites

Old:

ISSRs
Allozymes
RFLPs



Has this inequality in resources and language barriers led to a publication bias?



Frank Meyer
(1875-1918)



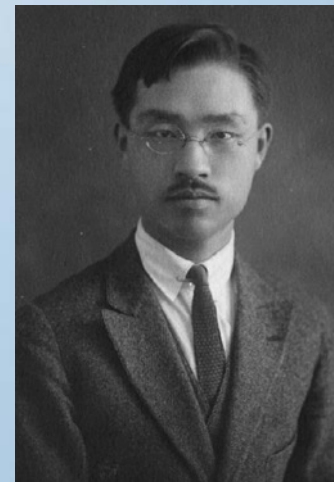
Another approach....



John G. Jack
(1861-1949)



Woon-Young
Chun



Hsen-Hsu Hu



Do researchers in developing countries receive proper credit for their work?

Who should be an author?

- Substantially contributed to conception & design, or data acquisition, or analysis of data
- Involved in drafting the manuscript or revising it for important intellectual content or approves of it
- Participated sufficiently to take public responsibility for appropriate portions of the content
 - Can explain their contribution
- The project could not have been done otherwise without this persons' contribution

How about non-researchers?

Debate on how to properly recognize “para-scientists”

Def. Members of indigenous and local communities with substantial knowledge, yet a lack of formal training



Dr. Nicola Flanagan



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A new species of *Vanilla* (Orchidaceae) from the North West Amazon in Colombia

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⁴North Amazon Travel & HBC, Inírida, Guainía, Colombia

Abstract

A distinctive species, *Vanilla denshikoiria*, is described from the North West Amazon, in Colombia, within the Guiana Shield region. The species has morphological features similar to those of species in the *Vanilla planifolia* group. It is an important addition to the vanilla crop wild relatives, bringing the total number of species in the *V. planifolia* group to 21. *Vanilla denshikoiria* is a narrow endemic, known from only a single locality, and highly vulnerable to anthropological disturbance. Under IUCN criteria it is categorized CR. The species has potential value as a non-timber forest product. We recommend a conservation program that includes support for *circa situm* actions implemented by the local communities.

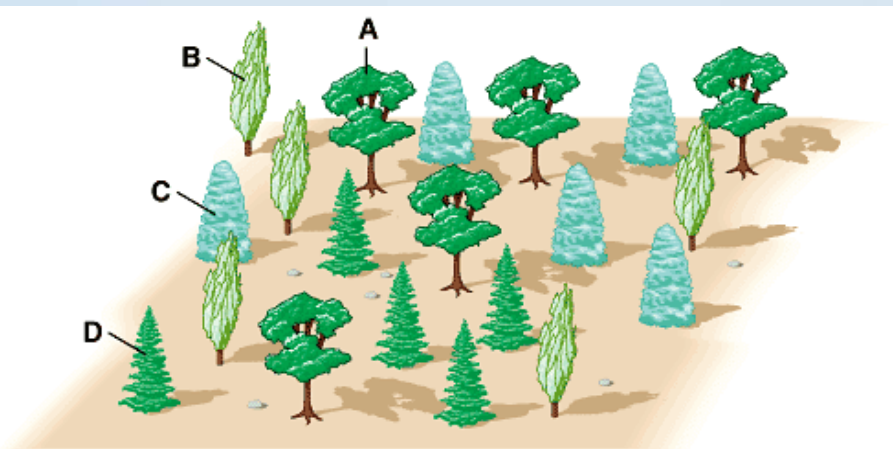
Our Analysis

Examined 87 **Developed** and 126 **Developing** Countries

Targeting Plant Conservation Genetics

Country Data:

- Land Area
- Gross Domestic Product
- Species richness (# of species)
- Diversity



Community 1

A: 25% B: 25% C: 25% D: 25%



Community 2

A: 80% B: 5% C: 5% D: 10%

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How to Calculate Diversity by Country

Not as easy as it seems!

Exploring with different measures:



- **Diversity** is equivalent to species richness
- **UN Diversity**
- Average Taxonomic Difference (**AvTD**) – Tunisia
- **Species richness by area**
- **Number of threatened species (per UN) divided by GBIF richness**



Our Analysis



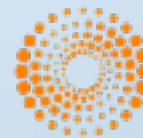
Publication Data:

- Plant species name and country where native
- Country of first author
- Country of the corresponding author
- Country of last author
- Countries of all other authors

Scopus[®]

- Range: 2004-present
- Owned by Elsevier
- 36,377 titles
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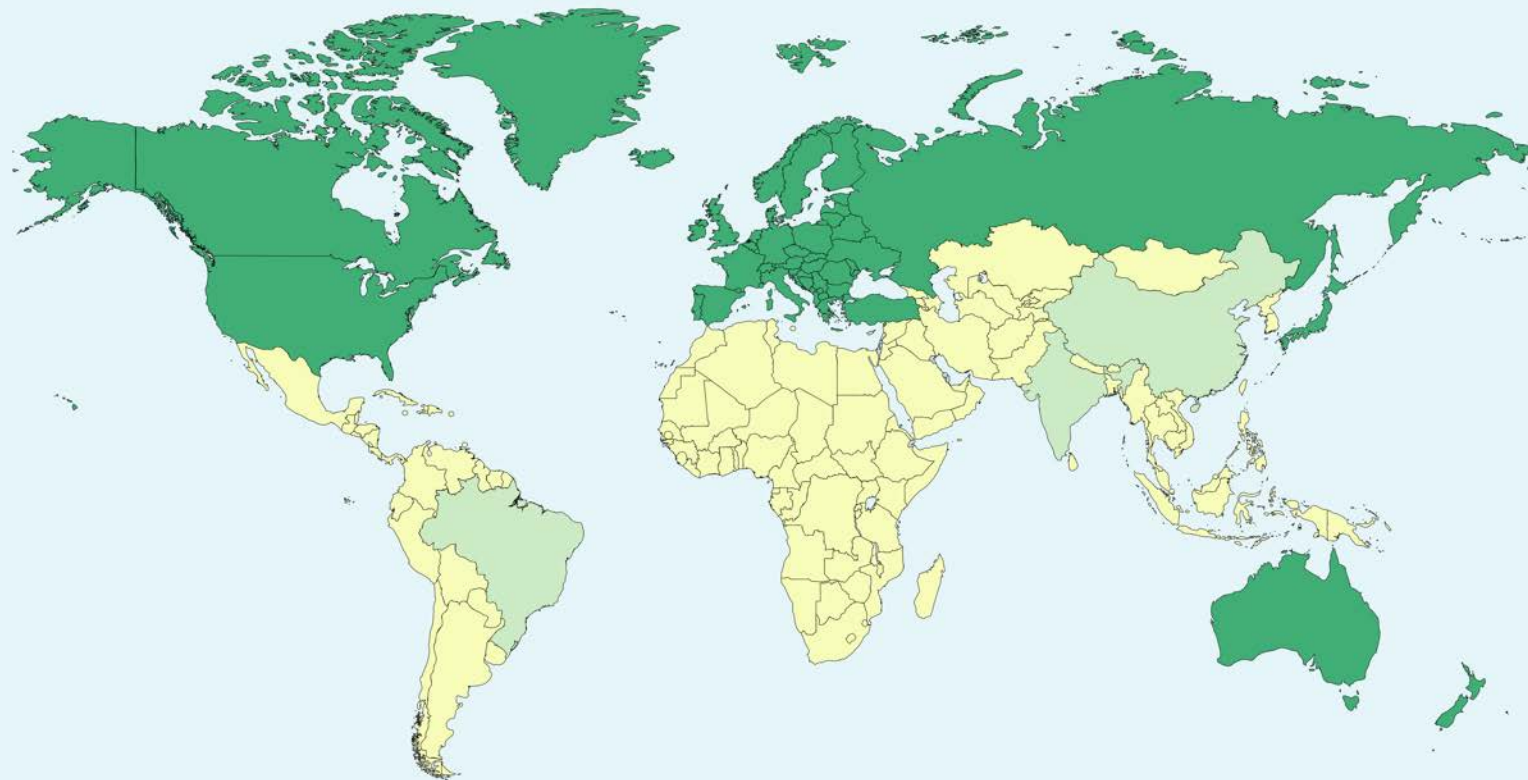
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- Range: 1900-present
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Mapping Genetic Diversity of Cherimoya (*Annona cherimola* Mill.): Application of Spatial Analysis for Conservation and Use of Plant Genetic Resources

Maarten van Zonneveld^{1,2*}, Xavier Scheldeman¹, Pilar Escribano³, María A. Viruel³, Patrick Van Damme^{2,4}, Willman Garcia⁵, César Tapia⁶, José Romero⁷, Manuel Siqueñas⁸, José I. Hormaza³

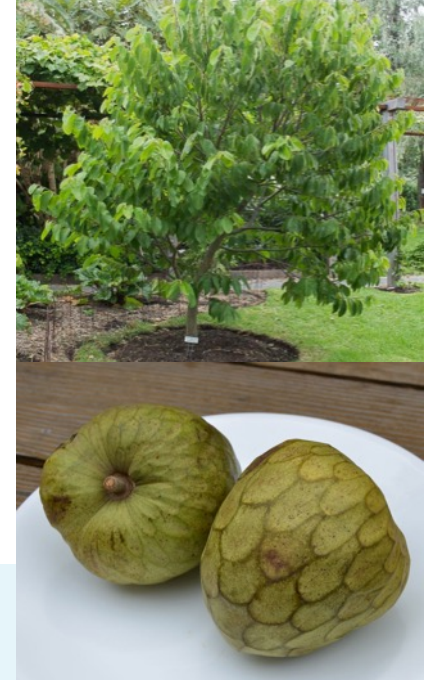
1 Bioversity International, Regional Office for the Americas, Cali, Colombia, **2** Ghent University, Faculty of Bioscience Engineering, Gent, Belgium, **3** Instituto de Hortofruticultura Subtropical y Mediterránea, (IHSM-UMA-CSIC), Estación Experimental La Mayora, Algarrobo-Costa, Málaga, Spain, **4** World Agroforestry Centre (ICRAF), GRP1 - Domestication, Nairobi, Kenya, **5** PROINPA, Oficina Regional Valle Norte, Cochabamba, Bolivia, **6** Instituto Nacional Autónomo de Investigaciones Agropecuarias (INIAP) Panamericana sur km1, Quito, Ecuador, **7** Naturaleza y Cultura Internacional (NCI), Loja, Ecuador, **8** Instituto Nacional de Innovación Agrícola (INIA), La Molina, Lima, Peru



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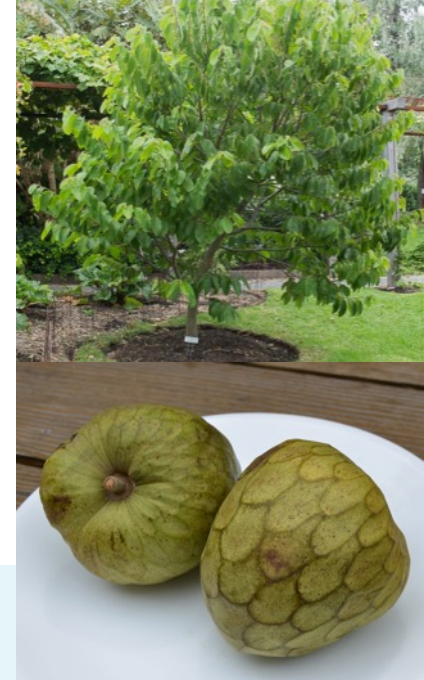
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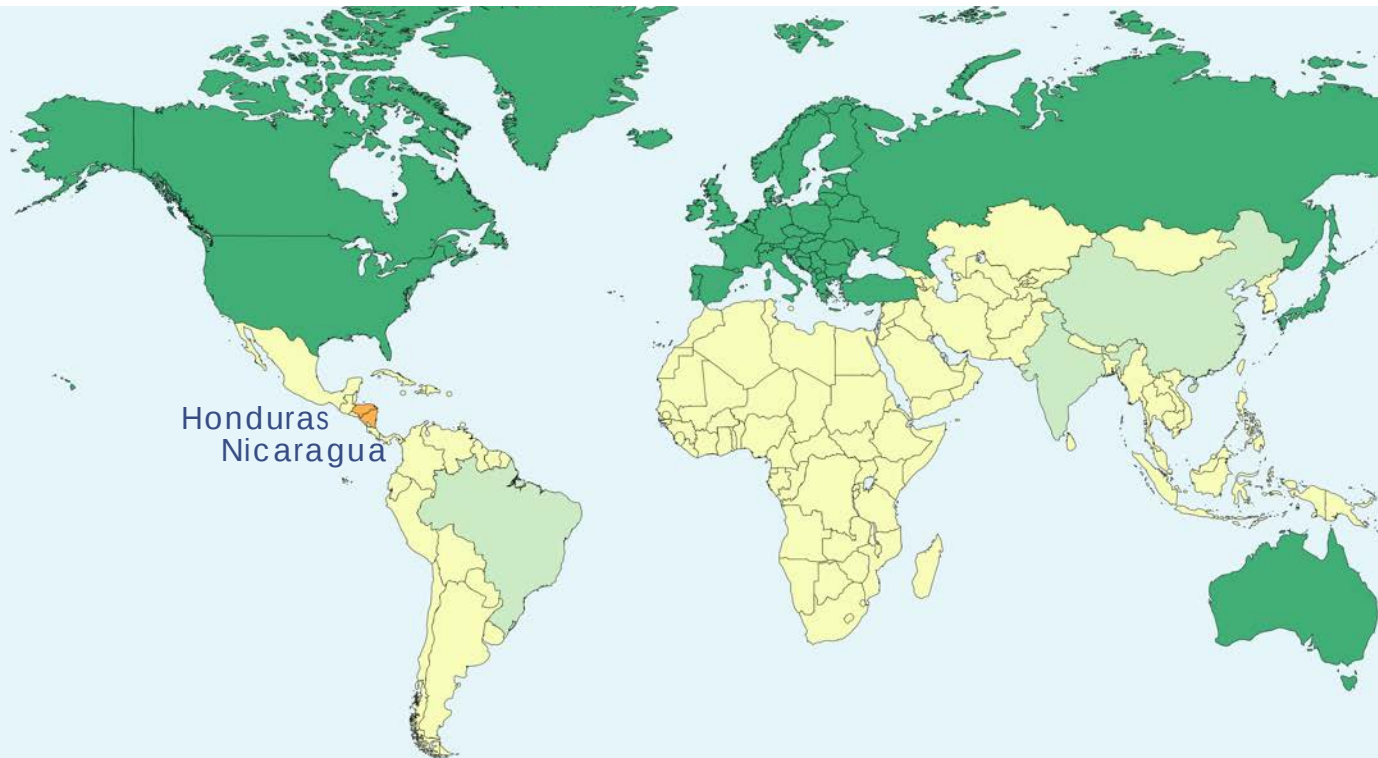
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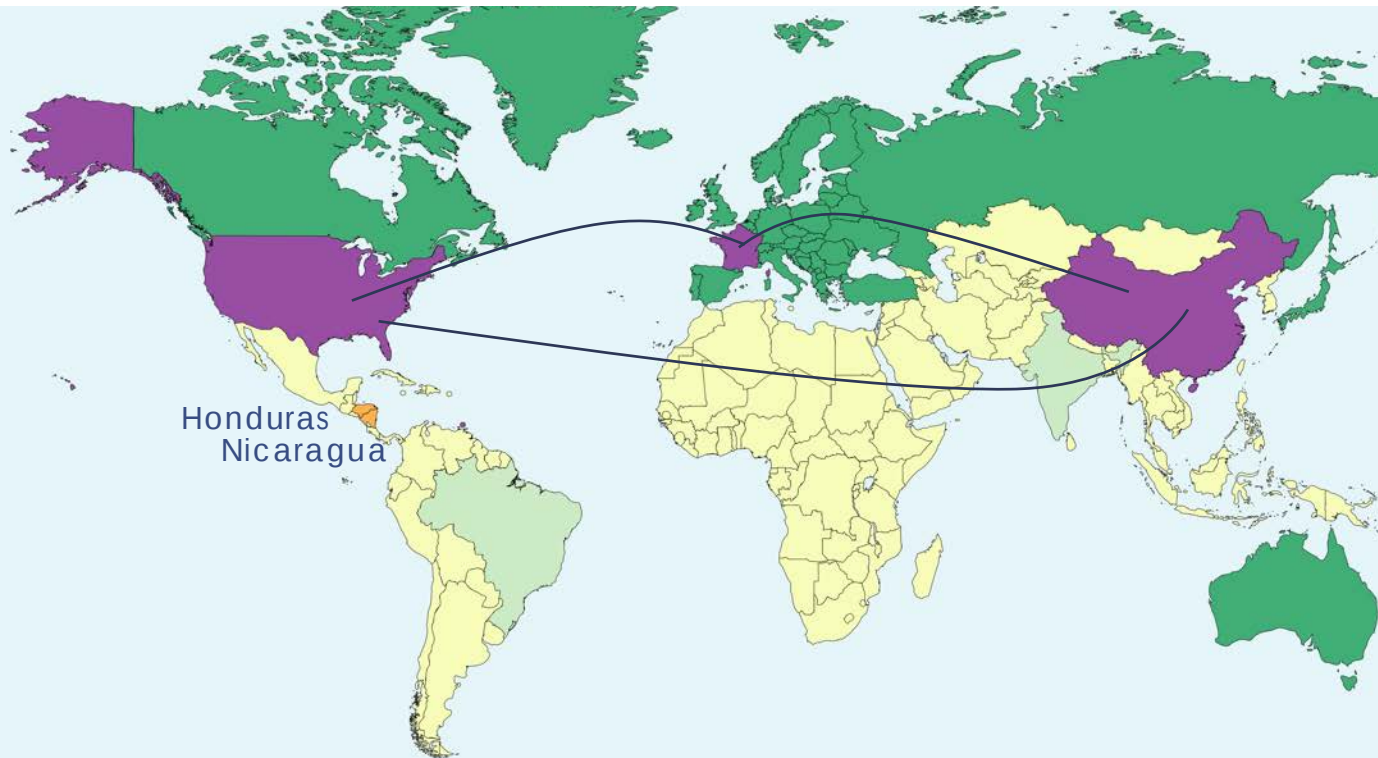
Genetic diversity and parentage in farmer varieties of cacao (*Theobroma cacao* L.) from Honduras and Nicaragua as revealed by single nucleotide polymorphism (SNP) markers

Kun Ji · Dapeng Zhang · Lambert A. Motilal ·
Michel Boccara · Philippe Lachenaud ·
Lyndel W. Meinhardt



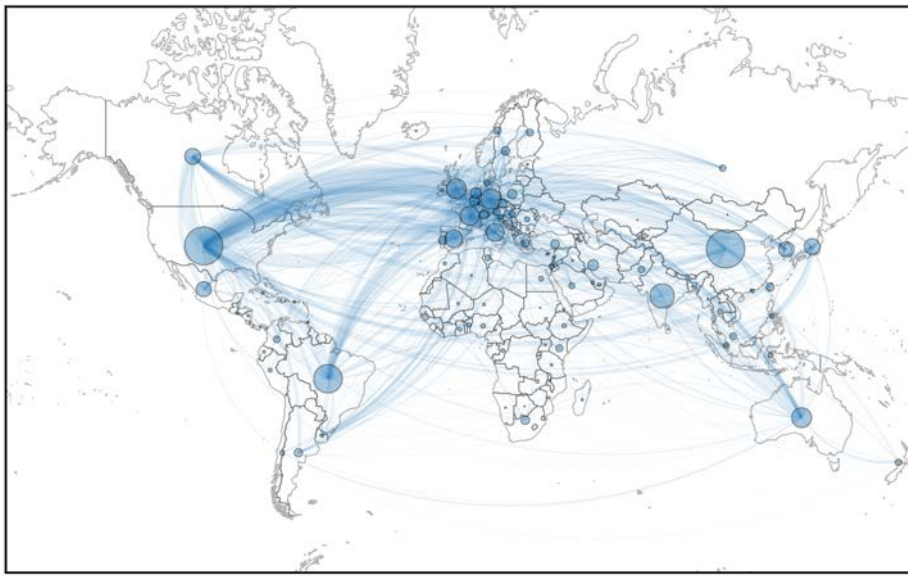
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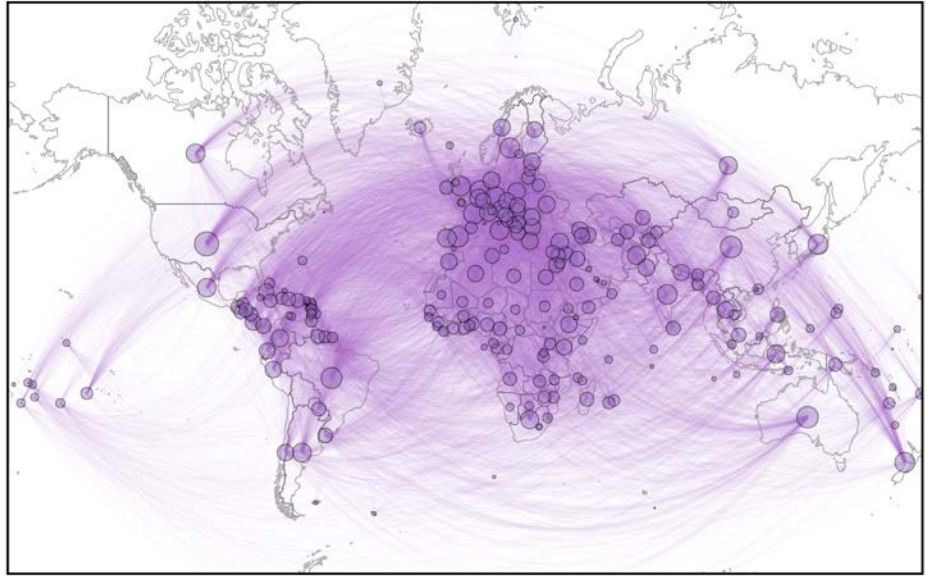


Some Results Thus Far...

Distribution of authors on published papers in plant conservation genetics



Distribution of plant species from the same dataset



Size of circles represent the number of researchers or species within each country

Lines indicate collaborations among authors (left) or network of species distributions (right)

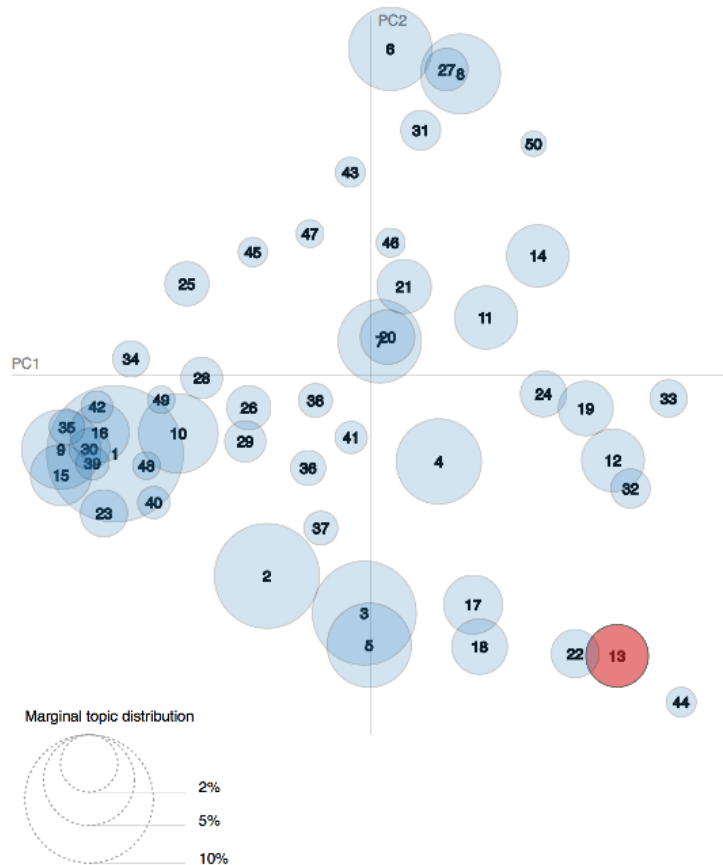
Semantic Analysis

- JSTOR full article database

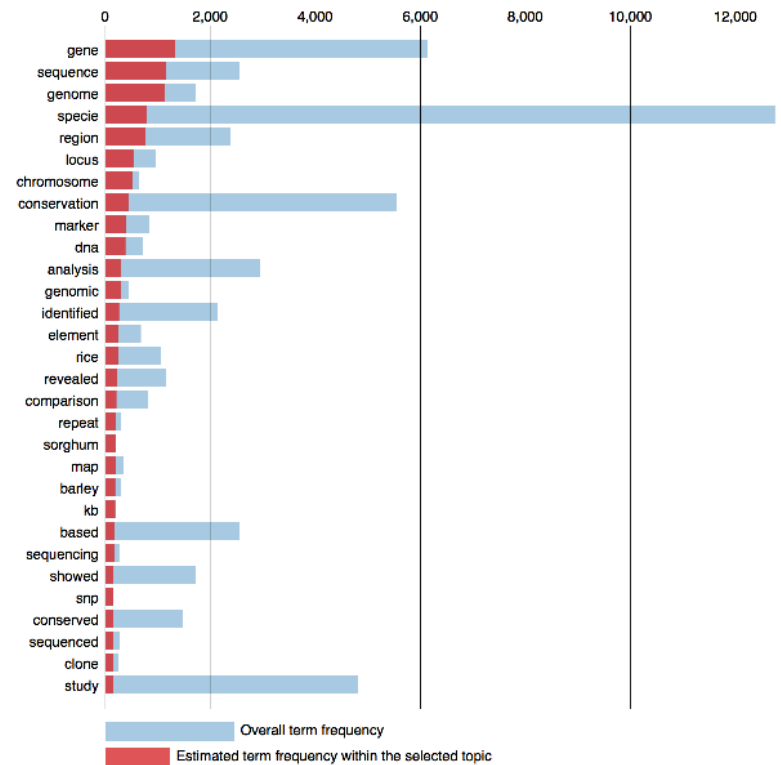


- By country

Intertopic Distance Map (via multidimensional scaling)



Top-30 Most Relevant Terms for Topic 13 (2.4% of tokens)



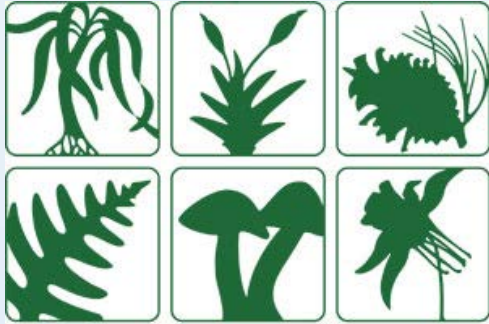
1. $\text{saliency}(\text{term } w) = \text{frequency}(w) * [\sum_t p(t | w) * \log(p(t | w)/p(t))]$ for topics t ; see Chuang et. al (2012)
2. $\text{relevance}(\text{term } w | \text{topic } t) = \lambda * p(w | t) + (1 - \lambda) * p(w | t)/p(w)$; see Sievert & Shirley (2014)

What We Have Learned So Far

- Collaboration is essential!
- Access to data sets can be challenging
- Some indices is not readily available

There is a **publication bias problem**, but we do not yet know the full extent.





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Which, if any, of the following influence your decision on where to submit your manuscripts?

“The journal has a reputation to provide a thorough review process that will improve my manuscript but with editors who understand the limitations that science has and are empathetic. Science is done in premier institutions but also under difficult circumstances in far corners of the world. A journal that has editors who are genuinely interested in improving science and hence more equitable is important to me. I judge this by knowing whether most of their papers come only from developed countries, well established institutions or only senior scientists (this is possible only within my field but the author institution address is a good clue).”

