



可持续发展大数据国际论坛  
International Forum on Big Data for  
Sustainable Development Goals

# Towards the Atlas of the Russian Flora: e-data are changing our reality

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(Moscow State University, Moscow, Russia)

September 2021  
online meeting

# Special issue of «Science» (2000)



BIOINFORMATICS FOR BIODIVERSITY  
VIEWPOINT

## The Quiet Revolution: Biodiversity Informatics and the Internet

Frank A. Bisby

The massive development of biodiversity-related information systems on the Internet has created much that appears exciting but chaotic, a diversity to match biodiversity itself. This richness and the arrays of new sources are counterbalanced by the maddening difficulty in knowing what is where, or of comparing like with like. But quietly, behind the first waves of exuberance, biologists and computer scientists have started to pull together in a rising tide of coherence and organization. The fledgling field of biodiversity informatics looks set to deliver major advances that could turn the Internet into a giant global biodiversity information system.

There is a resonance between the needs of biodiversity science and the opportunities for globalization and interoperability provided by the Internet. One is that biodiversity workers are distributed all over the globe, literally dotted about in every country and on every island. A second arises from our interdependence. Global events and global syntheses in

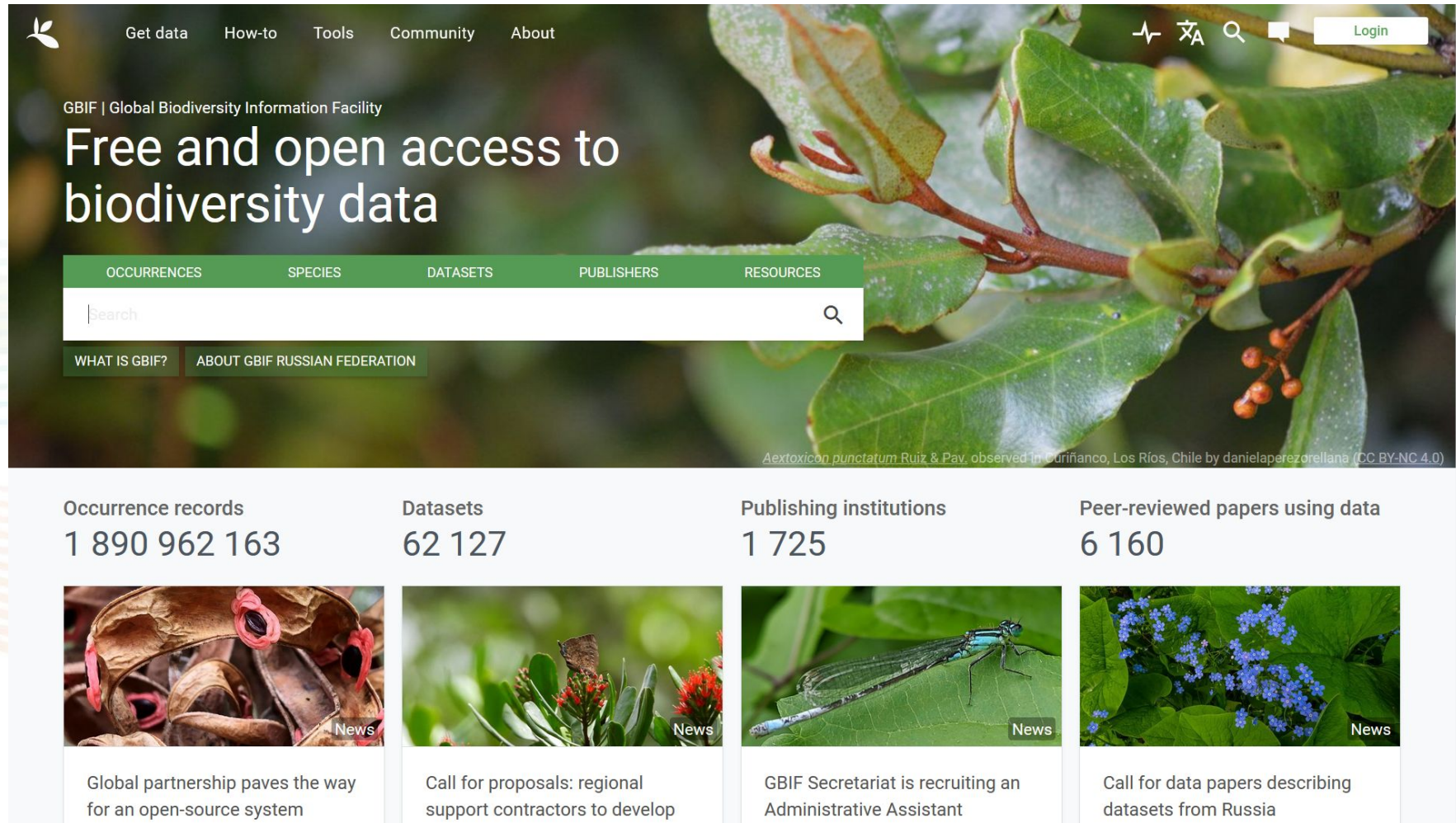
records. ERIN led the way by making the combined data available for Australia-wide Geographic Information System (GIS) analysis and modeling.

A number of interoperative systems are approaching the tasks originally offered by ERIN for its centralized data, but with the powerful possibility of extending to data

Australia (7) and by the European Natural History Specimen Information Network (ENHSIN) team in Europe (8).

A second area for networking and interoperability is the taxonomic framework itself. Again, there are centralized models from the 1990s where organizations bring together taxonomic treatments from authors and institutions to provide a centrally collated system. It now seems agreed that these taxonomic frameworks should be constructed “taxon-by-taxon” as in Species 2000 (1), the Integrated Taxonomic Information System (ITIS) (9), and the UNESCO-IOC Register of Marine Organisms (URMO) (10), thus avoiding the “flora-by-flora” work of integrating systems in which the taxonomies overlap, a contrast illustrated in Fig. 1. Only the International

# GBIF today



The screenshot shows the GBIF website homepage. At the top, there is a navigation menu with links for 'Get data', 'How-to', 'Tools', 'Community', and 'About'. On the right side of the header, there are icons for a home page, a language selector (showing 'A'), a search icon, a notification icon, and a 'Login' button. Below the navigation is a large banner with the text 'GBIF | Global Biodiversity Information Facility' and 'Free and open access to biodiversity data'. Underneath the banner is a green navigation bar with links for 'OCCURRENCES', 'SPECIES', 'DATASETS', 'PUBLISHERS', and 'RESOURCES'. A search bar is located below this bar. Further down, there are two buttons: 'WHAT IS GBIF?' and 'ABOUT GBIF RUSSIAN FEDERATION'. The main content area features four statistics: 'Occurrence records 1 890 962 163', 'Datasets 62 127', 'Publishing institutions 1 725', and 'Peer-reviewed papers using data 6 160'. Below these statistics are four news items, each with a small image and a 'News' label. The news items are: 'Global partnership paves the way for an open-source system', 'Call for proposals: regional support contractors to develop', 'GBIF Secretariat is recruiting an Administrative Assistant', and 'Call for data papers describing datasets from Russia'. At the bottom of the page, there is a decorative graphic of wavy lines in shades of green and blue.

Get data How-to Tools Community About

GBIF | Global Biodiversity Information Facility

## Free and open access to biodiversity data

OCCURRENCES SPECIES DATASETS PUBLISHERS RESOURCES

Search

WHAT IS GBIF? ABOUT GBIF RUSSIAN FEDERATION

Occurrence records  
1 890 962 163

Datasets  
62 127

Publishing institutions  
1 725

Peer-reviewed papers using data  
6 160

Global partnership paves the way for an open-source system

Call for proposals: regional support contractors to develop

GBIF Secretariat is recruiting an Administrative Assistant

Call for data papers describing datasets from Russia

*Aextoxicon punctatum* Ruiz & Pav., observed in Curifianco, Los Ríos, Chile by danielaperezorellana (CC BY-NC 4.0)


# Diversity of original databases



MUSÉUM  
NATURAL HISTOIRE PARIS

MNHN / Vascular plants (P) / P0074787

*Allium kaschianum* Regel **STRATYLS**



**SPECIMEN**

Herbar: MHH I-P-P0074787  
Sector: ASI (Asia)  
reçu le 30 aout 1890

**TAXONOMY**

Family: Amaryllidaceae  
Genus: *Allium*  
Species: *Allium kaschianum*  
Name: *Allium kaschianum* Regel

**ORIGIN**

Country label: Turkestan  
Verbatim locality: Nilki (Krasch)  
Phenology: set  
Collector's name: A. Regel  
Expedition: Her Turkestanicum  
Collection date: 1879-6-30

Paris

Title: 00247928.jpg

# Filed As:  
Amaryllidaceae  
*Allium stipitatum* Ledeb. (possible type)

All Determinations:  
*Allium stipitatum* Ledeb.

Location:  
China, Songaria chin. ad lacum Salang Her.

Collector(s):  
Collector unspecified s.n., n.d.

New York

Specimen Details

Download Records

Herbarium Catalogue

Family: Alliaceae  
Current Name: *Allium mairei* H.Lév.  
Collector: Forrest, G.  
Collector no.: 914  
Collection Date:  
Country: China  
Location: E. Tibet and S.W. China.  
Lat and Long:  
Data Source:  
Accuracy:  
Altitude:  
Related Specimens:

Type Status: Unknown type material  
Phenology:  
Plant Parts: Leaves, Root, Flowers/inflorescence (with inflorescence axis), Bulb  
Item: Sheet  
Project: Monocot Types, Global Types  
Habitat:  
Plant Description: Note the strongly ribbed blades and the crenulate margins.  
General Comments: Collector for A. K. Bulley of Ness, Neston, Cheshire

Scientific Name: *Allium mairei* H.Lév.  
Determiner:  
Determination Date:  
Type of?:  
Determination Notes: Author citation as on label: Lévl.

London

Растения / Коллекции / Гербарий МГУ

Полное изображение




Иллюстрация: *Allium stoliczkae* Regel (Lév.)

Штрикод: MV0734931  
Название в коллекции: *Allium stoliczkae*  
Принятое название: *Allium przewalskianum* Regel  
Семейство: Amaryllidaceae  
Районирование: Зарубежная Азия (ASIA) (КНР)  
Эпителика: 1.08.1956. Собр. Юнатов А. А.  
Дата ввода эпитета: 2.07.2018  
Полная карточка  
Все образцы этого вида  
Все фото в природе этого вида (plantarium.ru)  
OCR: СИНДЖИНСКОЕ КОЛЛЕКЦИОННОЕ СЕДИЛИЩЕ АКАДЕМИИ НАУК КИТАЙСКОЙ НАРОДНОЙ РЕСПУБЛИКИ 1968 1968-4 Деление желваковой ветви 31.1 км. Коммунальное предприятие. Синьцзян-Уйгурский автономный район. Синьцзян-Уйгурская автономная область. дит? - вы? 10.11.1968 г. Л. Юнатов А. А. не выдано? - г. Синьцзян Уйгурская авт. обл. Куньмин. Инст. Бот. Акад. Наук КНР (ИВ)

Moscow

# Universality of GBIF standards



Record		Occurrence	
Basis of record	PRESERVED_SPECIMEN	Catalogue number	P00747877
Collection code	P	Occurrence ID	<a href="http://coadb.mnhn.fr/mnhnvp/p00747877">http://coadb.mnhn.fr/mnhnvp/p00747877</a>
Institution code	MNH-N	Occurrence remarks	requ le 30 aout 1890
<b>Event</b>		Preparations	hb
Day	30	Recorded by	Regel, A.
Month	6	<b>Identification</b>	
Year	1879	Type status	Synonym
Event date	1879-06-30T00:00:00	<b>Location</b>	
<b>Taxon</b>		Country or area	unknown or invalid
Kingdom	Plantae	Country code	ZZ
Phylum	Tracheophyta	Verbatim locality	Niki (Kasch)
Class	Liliopsida	<b>Other</b>	
Order	Asparagales	Identifier	<a href="http://coadb.mnhn.fr/mnhnvp/p00747877">http://coadb.mnhn.fr/mnhnvp/p00747877</a>
Family	Amaryllidaceae	Record license	<a href="http://creativecommons.org/licenses/by/4.0/legalcode">http://creativecommons.org/licenses/by/4.0/legalcode</a>
Genus	Allium	Modified	2015-09-05T09:21:00.000+0000
Specific epithet	kaschianum	<b>Rank</b>	
Scientific name	Allium kaschianum Regel.	Taxonomic status	ACCEPTED
Scientific name authorship		<b>Other</b>	
Rank	SPECIES	Identifier	<a href="http://coadb.mnhn.fr/mnhnvp/p00747877">http://coadb.mnhn.fr/mnhnvp/p00747877</a>
Taxonomic status	ACCEPTED	Record license	<a href="http://creativecommons.org/licenses/by/4.0/legalcode">http://creativecommons.org/licenses/by/4.0/legalcode</a>
<b>Other</b>		Modified	2015-09-05T09:21:00.000+0000
Identifier	<a href="http://coadb.mnhn.fr/mnhnvp/p00747877">http://coadb.mnhn.fr/mnhnvp/p00747877</a>	<b>Rank</b>	
Record license	<a href="http://creativecommons.org/licenses/by/4.0/legalcode">http://creativecommons.org/licenses/by/4.0/legalcode</a>	Taxonomic status	ACCEPTED
Modified	2015-09-05T09:21:00.000+0000	<b>Other</b>	
<b>Other</b>		Identifier	<a href="http://coadb.mnhn.fr/mnhnvp/p00747877">http://coadb.mnhn.fr/mnhnvp/p00747877</a>
Record license	<a href="http://creativecommons.org/licenses/by/4.0/legalcode">http://creativecommons.org/licenses/by/4.0/legalcode</a>	Record license	<a href="http://creativecommons.org/licenses/by/4.0/legalcode">http://creativecommons.org/licenses/by/4.0/legalcode</a>
Modified	2015-09-05T09:21:00.000+0000	Modified	2015-09-05T09:21:00.000+0000

P00747877

Record		Occurrence	
Basis of record	PRESERVED_SPECIMEN	Catalogue number	247926
Collection code	NY	Occurrence ID	c18b3c7a-3f18-4c44-9eb5-e941c294bec
Institution code	NY	Occurrence remarks	Herb. Acad. Petrop. sheet
<b>Event</b>		Preparations	s.n.
Day	s.d.	Record number	Collector unspecified
Month		<b>Identification</b>	
Year		Type status	Type
Event date		<b>Location</b>	
<b>Taxon</b>		Country or area	ASIA
Kingdom	Plantae	Country code	CN
Phylum	Tracheophyta	Locality	Songaria chn. ad lacum Saixang-Nor
Class	Liliopsida	<b>Other</b>	
Order	Asparagales	Identifier	<a href="http://coadb.mnhn.fr/mnhnvp/p00747877">http://coadb.mnhn.fr/mnhnvp/p00747877</a>
Family	Amaryllidaceae	Record license	<a href="http://creativecommons.org/licenses/by/4.0/legalcode">http://creativecommons.org/licenses/by/4.0/legalcode</a>
Genus	Allium	Modified	2016-10-21T15:56:00.000+0000
Specific epithet	tulipifolium	<b>Rank</b>	
Nomenclatural code	ICN	Taxonomic status	ACCEPTED
Scientific name	Allium tulipifolium Ledeb.	<b>Other</b>	
Rank	SPECIES	Identifier	<a href="http://coadb.mnhn.fr/mnhnvp/p00747877">http://coadb.mnhn.fr/mnhnvp/p00747877</a>
Taxonomic status	ACCEPTED	Record license	<a href="http://creativecommons.org/licenses/by/4.0/legalcode">http://creativecommons.org/licenses/by/4.0/legalcode</a>
<b>Other</b>		Modified	2016-10-21T15:56:00.000+0000
Identifier	<a href="http://coadb.mnhn.fr/mnhnvp/p00747877">http://coadb.mnhn.fr/mnhnvp/p00747877</a>	<b>Rank</b>	
Record license	<a href="http://creativecommons.org/licenses/by/4.0/legalcode">http://creativecommons.org/licenses/by/4.0/legalcode</a>	Taxonomic status	ACCEPTED
Modified	2016-10-21T15:56:00.000+0000	<b>Other</b>	
<b>Other</b>		Identifier	<a href="http://coadb.mnhn.fr/mnhnvp/p00747877">http://coadb.mnhn.fr/mnhnvp/p00747877</a>
Record license	<a href="http://creativecommons.org/licenses/by/4.0/legalcode">http://creativecommons.org/licenses/by/4.0/legalcode</a>	Record license	<a href="http://creativecommons.org/licenses/by/4.0/legalcode">http://creativecommons.org/licenses/by/4.0/legalcode</a>
Modified	2016-10-21T15:56:00.000+0000	Modified	2016-10-21T15:56:00.000+0000

NY00247926

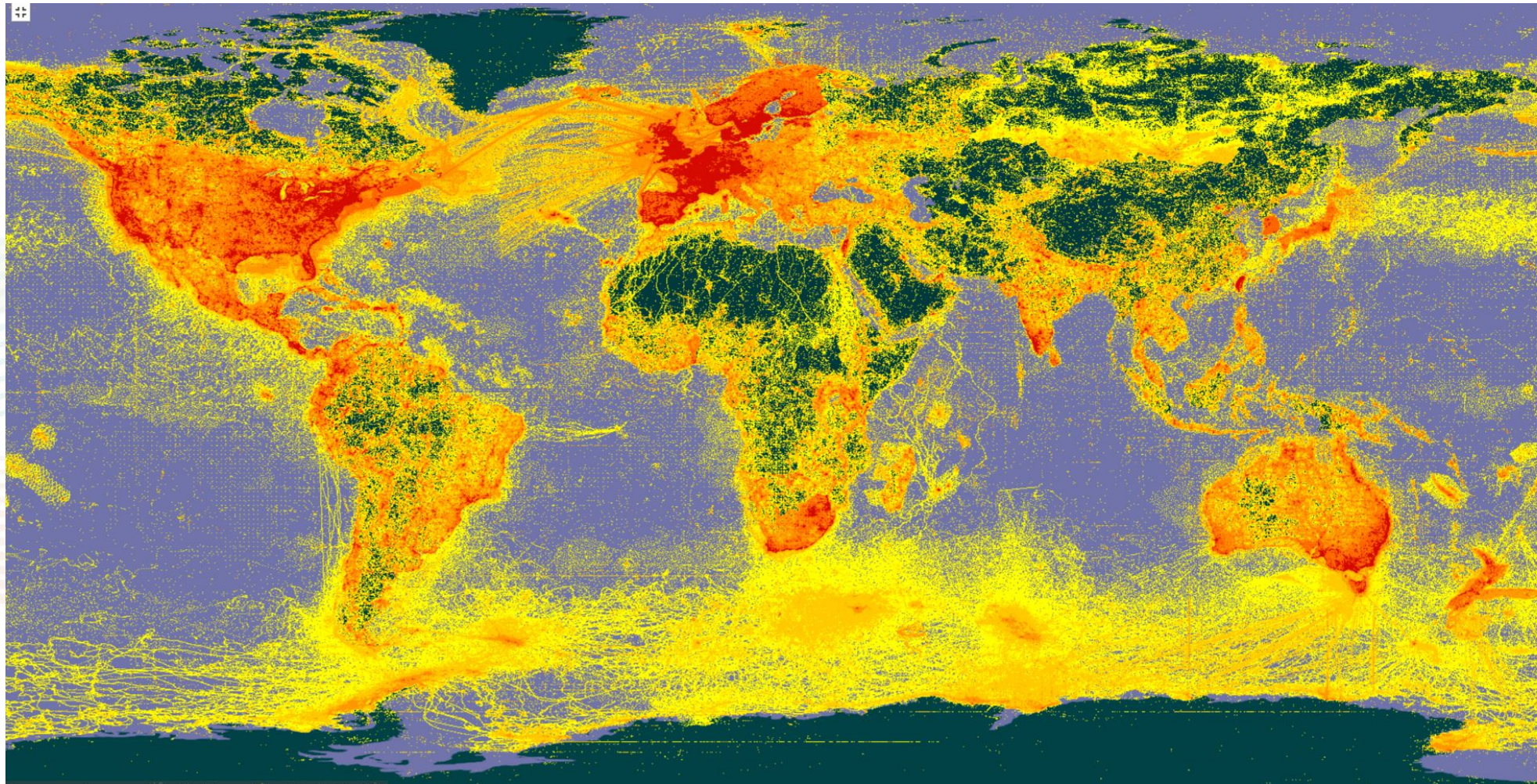
Record		Occurrence	
Basis of record	PRESERVED_SPECIMEN	Catalogue number	K000464620
Collection code	Herbarium	Occurrence ID	<a href="http://specimens.banum.ru/000464620">http://specimens.banum.ru/000464620</a>
Institution code	K	Occurrence remarks	Collector for A.K.Bulley of Ness, Weston, Cheshire
<b>Event</b>		Record number	914
Day		Recorded by	Forrest, G.
Month		<b>Taxon</b>	
Year		Kingdom	Plantae
Event date		Phylum	Tracheophyta
<b>Taxon</b>		Class	Liliopsida
Kingdom	Plantae	Order	Asparagales
Phylum	Tracheophyta	Family	Amaryllidaceae
Class	Liliopsida	Genus	Allium
Order	Asparagales	Specific epithet	mairei
Family	Amaryllidaceae	Higher classification	ALLIACEAE
Genus	Allium	Scientific name	Allium mairei H.L.
Specific epithet	mairei	Scientific name authorship	
Nomenclatural code	ICN	Rank	SPECIES
Scientific name	Allium mairei H.L.	Taxon remarks	Author citation as on label: Lévl.
Rank	SPECIES	Taxonomic status	ACCEPTED
Taxonomic status	ACCEPTED	<b>Other</b>	
<b>Other</b>		Identifier	<a href="http://coadb.mnhn.fr/mnhnvp/p00747877">http://coadb.mnhn.fr/mnhnvp/p00747877</a>
Identifier	<a href="http://coadb.mnhn.fr/mnhnvp/p00747877">http://coadb.mnhn.fr/mnhnvp/p00747877</a>	Record license	<a href="http://creativecommons.org/licenses/by/4.0/legalcode">http://creativecommons.org/licenses/by/4.0/legalcode</a>
Record license	<a href="http://creativecommons.org/licenses/by/4.0/legalcode">http://creativecommons.org/licenses/by/4.0/legalcode</a>	Modified	2012-09-07T13:40:36.300+0000
Modified	2012-09-07T13:40:36.300+0000	<b>Rank</b>	
<b>Other</b>		Taxonomic status	ACCEPTED
Identifier	<a href="http://coadb.mnhn.fr/mnhnvp/p00747877">http://coadb.mnhn.fr/mnhnvp/p00747877</a>	<b>Other</b>	
Record license	<a href="http://creativecommons.org/licenses/by/4.0/legalcode">http://creativecommons.org/licenses/by/4.0/legalcode</a>	Identifier	<a href="http://coadb.mnhn.fr/mnhnvp/p00747877">http://coadb.mnhn.fr/mnhnvp/p00747877</a>
Modified	2012-09-07T13:40:36.300+0000	Record license	<a href="http://creativecommons.org/licenses/by/4.0/legalcode">http://creativecommons.org/licenses/by/4.0/legalcode</a>
<b>Other</b>		Modified	2012-09-07T13:40:36.300+0000
Identifier	<a href="http://coadb.mnhn.fr/mnhnvp/p00747877">http://coadb.mnhn.fr/mnhnvp/p00747877</a>	<b>Rank</b>	
Record license	<a href="http://creativecommons.org/licenses/by/4.0/legalcode">http://creativecommons.org/licenses/by/4.0/legalcode</a>	Taxonomic status	ACCEPTED
Modified	2012-09-07T13:40:36.300+0000	<b>Other</b>	
<b>Other</b>		Identifier	<a href="http://coadb.mnhn.fr/mnhnvp/p00747877">http://coadb.mnhn.fr/mnhnvp/p00747877</a>
Record license	<a href="http://creativecommons.org/licenses/by/4.0/legalcode">http://creativecommons.org/licenses/by/4.0/legalcode</a>	Record license	<a href="http://creativecommons.org/licenses/by/4.0/legalcode">http://creativecommons.org/licenses/by/4.0/legalcode</a>
Modified	2012-09-07T13:40:36.300+0000	Modified	2012-09-07T13:40:36.300+0000

K000464620

Record		Occurrence	
Basis of record	PRESERVED_SPECIMEN	Catalogue number	MW0734831
Collection code	MW	Disposition	In collection
Institution code	MSU	Occurrence ID	MW0734831
<b>Event</b>		Occurrence status	present
Day	1	Preparations	herbarium specimen
Month	8	Recorded by	Vinator, A. A.
Year	1958	Associated media	
Event date	1958-08-01T00:00:00	<b>Taxon</b>	
Event date	1958-08-01T00:00:00	Kingdom	Plantae
Sampling protocol	common practice of herbarium collecting	Phylum	Tracheophyta
<b>Taxon</b>		Class	Liliopsida
Kingdom	Plantae	Order	Asparagales
Phylum	Tracheophyta	Family	Amaryllidaceae
Class	Liliopsida	Genus	Allium
Order	Asparagales	Specific epithet	stoliczkae
Family	Amaryllidaceae	Accepted name usage ID	79070519
Genus	Allium	Higher classification	Plantae Tracheophyta Liliopsida Asparagales Amaryllidaceae Allium
Specific epithet	stoliczkae	Accepted name usage	Allium przewalskianum
Accepted name usage ID	79070519	Nomenclatural code	International Code of Nomenclature for algae, fungi, and plants
Higher classification	Plantae Tracheophyta Liliopsida Asparagales Amaryllidaceae Allium	Parent name usage	Allium
Accepted name usage	Allium przewalskianum	Parent name usage ID	11472305
Nomenclatural code	International Code of Nomenclature for algae, fungi, and plants	Scientific name	Allium stoliczkae Regel
Parent name usage	Allium	Rank	SPECIES
Parent name usage ID	11472305	Taxonomic status	SYNONYM
Scientific name	Allium stoliczkae Regel	Vernacular name	flye
Rank	SPECIES	<b>Other</b>	
Taxonomic status	SYNONYM	Identifier	<a href="http://coadb.mnhn.fr/mnhnvp/p00747877">http://coadb.mnhn.fr/mnhnvp/p00747877</a>
Vernacular name	flye	Record license	<a href="http://creativecommons.org/licenses/by/4.0/legalcode">http://creativecommons.org/licenses/by/4.0/legalcode</a>
<b>Other</b>		Modified	2012-09-07T13:40:36.300+0000
Identifier	<a href="http://coadb.mnhn.fr/mnhnvp/p00747877">http://coadb.mnhn.fr/mnhnvp/p00747877</a>	<b>Rank</b>	
Record license	<a href="http://creativecommons.org/licenses/by/4.0/legalcode">http://creativecommons.org/licenses/by/4.0/legalcode</a>	Taxonomic status	ACCEPTED
Modified	2012-09-07T13:40:36.300+0000	<b>Other</b>	
<b>Other</b>		Identifier	<a href="http://coadb.mnhn.fr/mnhnvp/p00747877">http://coadb.mnhn.fr/mnhnvp/p00747877</a>
Record license	<a href="http://creativecommons.org/licenses/by/4.0/legalcode">http://creativecommons.org/licenses/by/4.0/legalcode</a>	Record license	<a href="http://creativecommons.org/licenses/by/4.0/legalcode">http://creativecommons.org/licenses/by/4.0/legalcode</a>
Modified	2012-09-07T13:40:36.300+0000	Modified	2012-09-07T13:40:36.300+0000

MW0734831

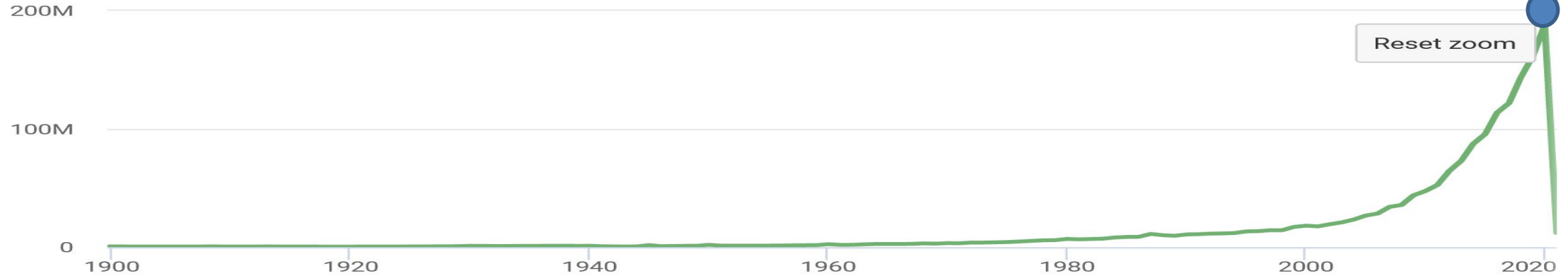
# GBIF geodata



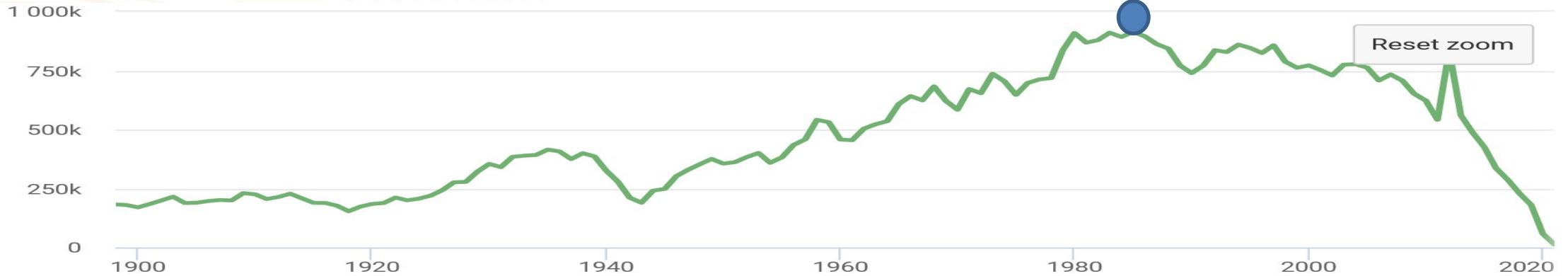
# GBIF data by years



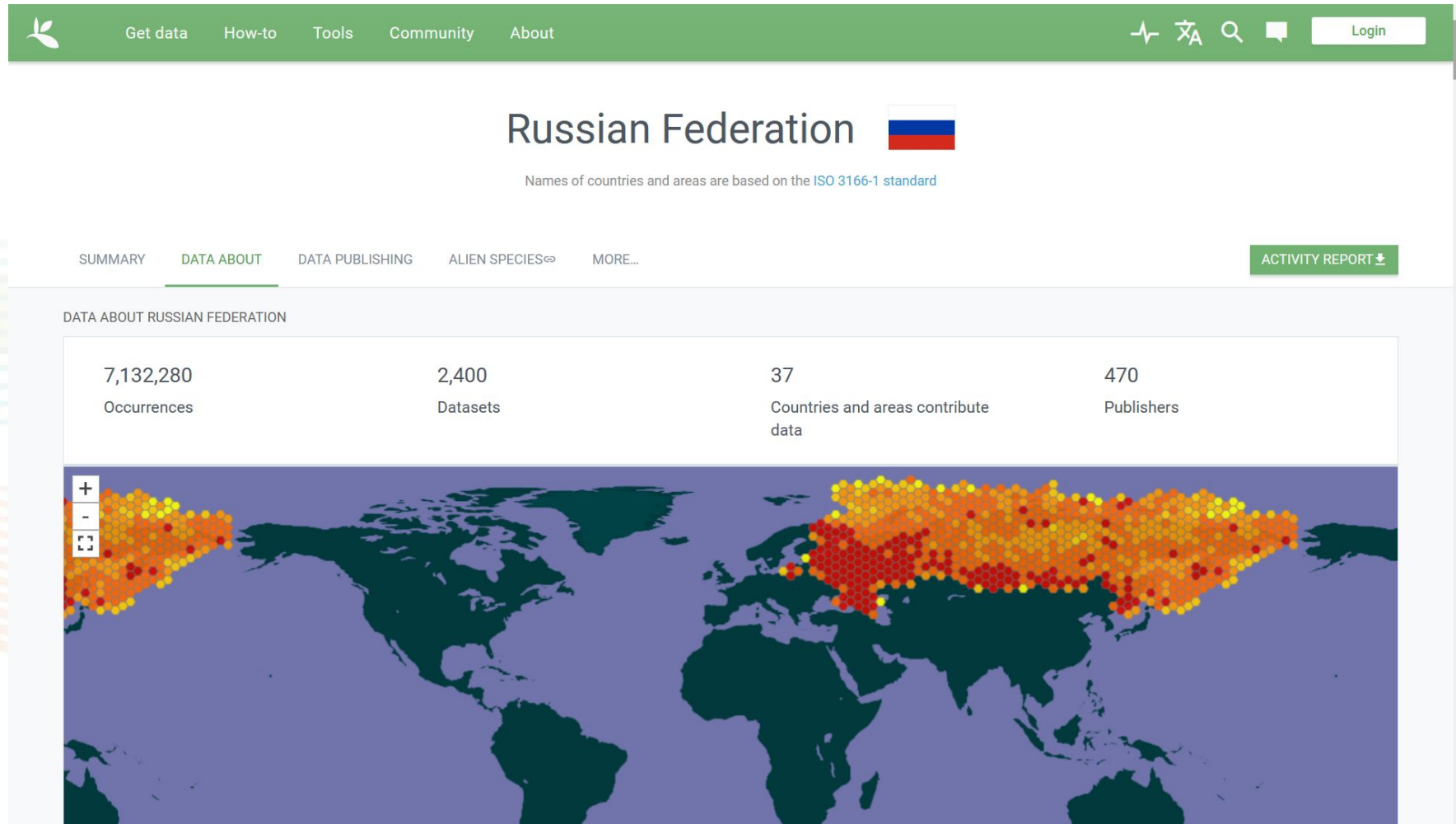
All data: max. 188,197,913 (2020)



Herbarium specimens: max. 913,455 (1985)

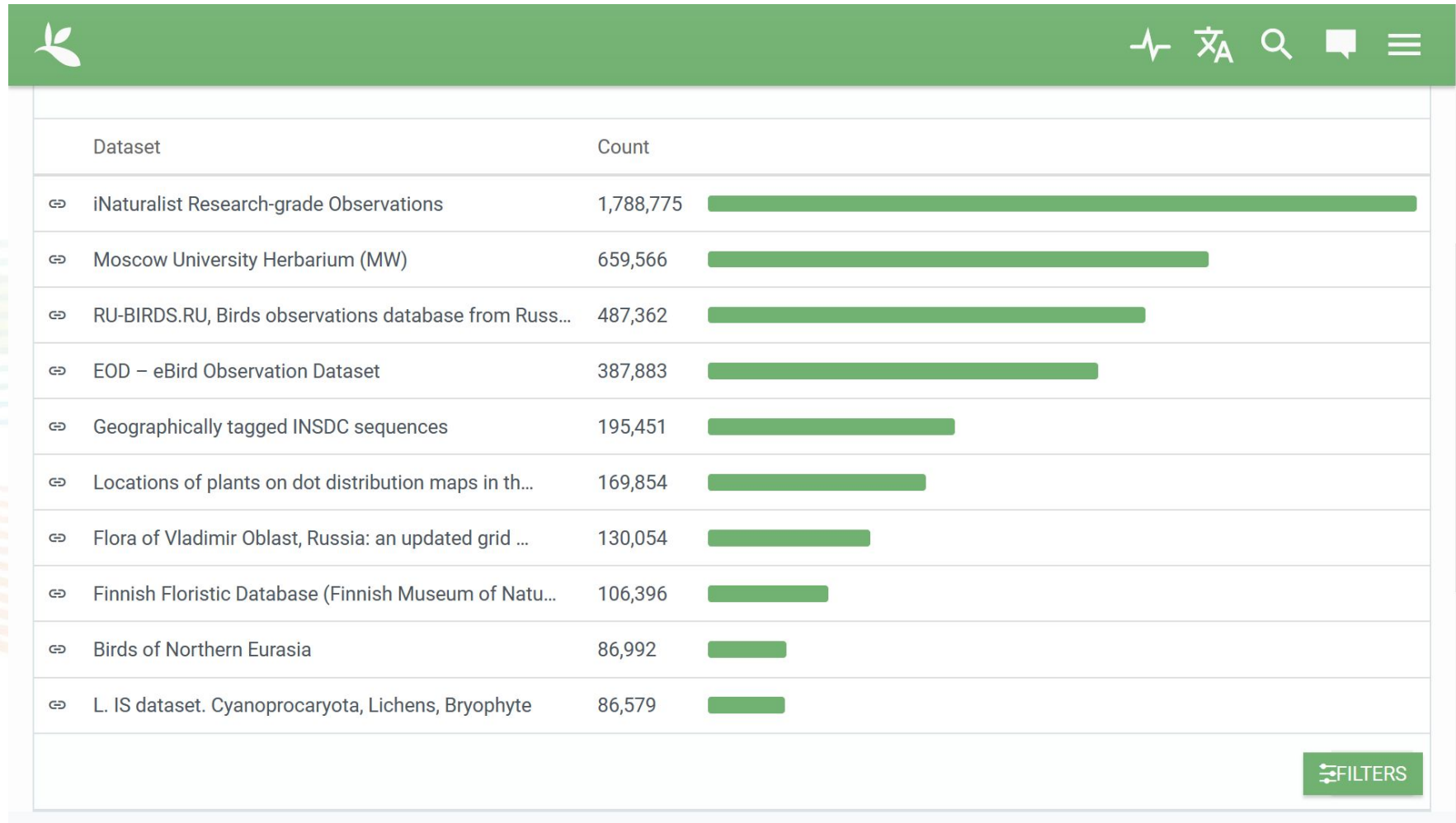


# GBIF data for Russia



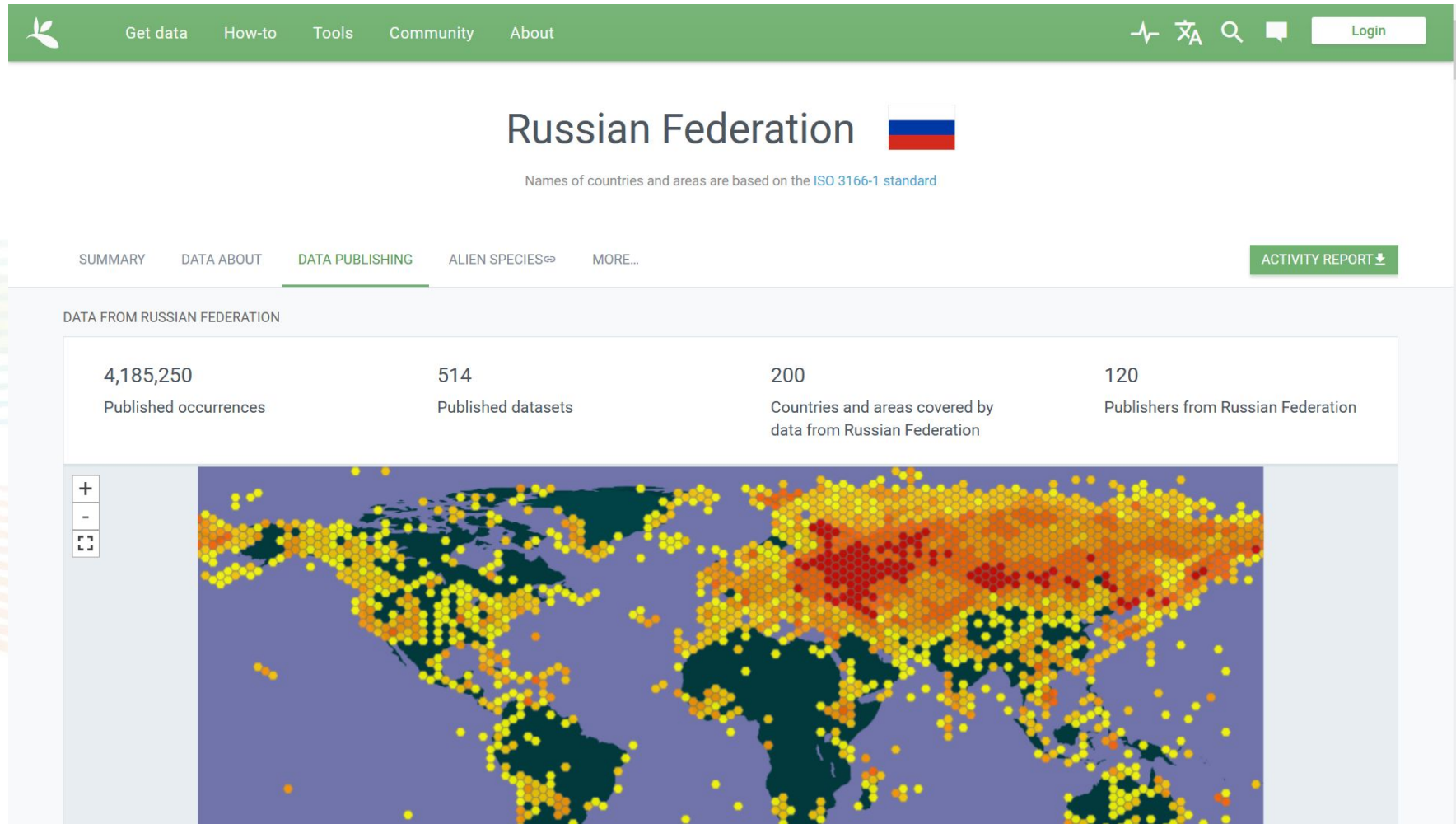


# Top sources for Russia in GBIF

A screenshot of the GBIF data interface showing a table of top sources for Russia. The interface has a green header bar with a leaf icon on the left and navigation icons (heart, text, search, chat, menu) on the right. The table lists datasets with their counts and corresponding green horizontal bars. A 'FILTERS' button is visible in the bottom right corner of the table area.

Dataset	Count
iNaturalist Research-grade Observations	1,788,775
Moscow University Herbarium (MW)	659,566
RU-BIRDS.RU, Birds observations database from Russ...	487,362
EOD – eBird Observation Dataset	387,883
Geographically tagged INSDC sequences	195,451
Locations of plants on dot distribution maps in th...	169,854
Flora of Vladimir Oblast, Russia: an updated grid ...	130,054
Finnish Floristic Database (Finnish Museum of Natu...	106,396
Birds of Northern Eurasia	86,992
L. IS dataset. Cyanoprocaryota, Lichens, Bryophyte	86,579

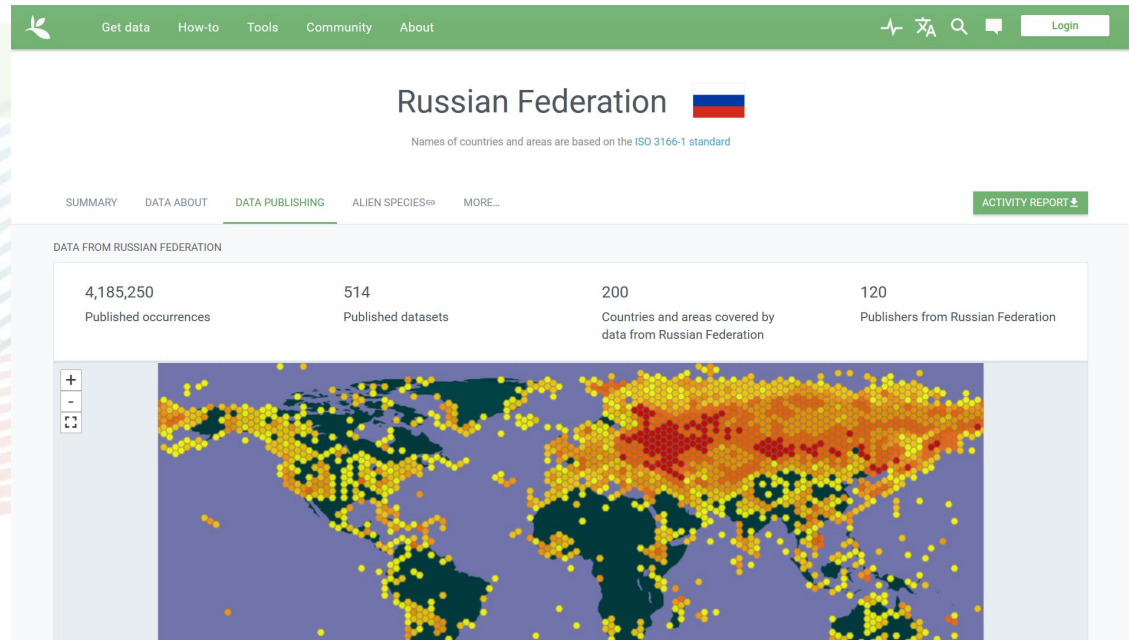
# GBIF data from Russian institutions



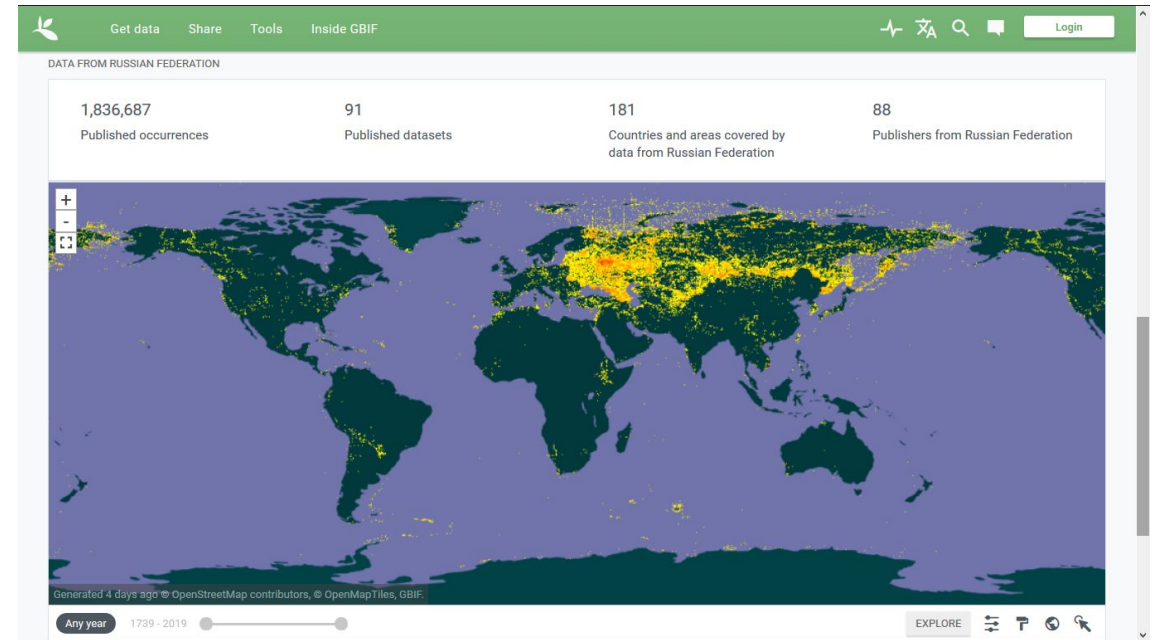
# GBIF data from Russia: 2021 vs. 2019



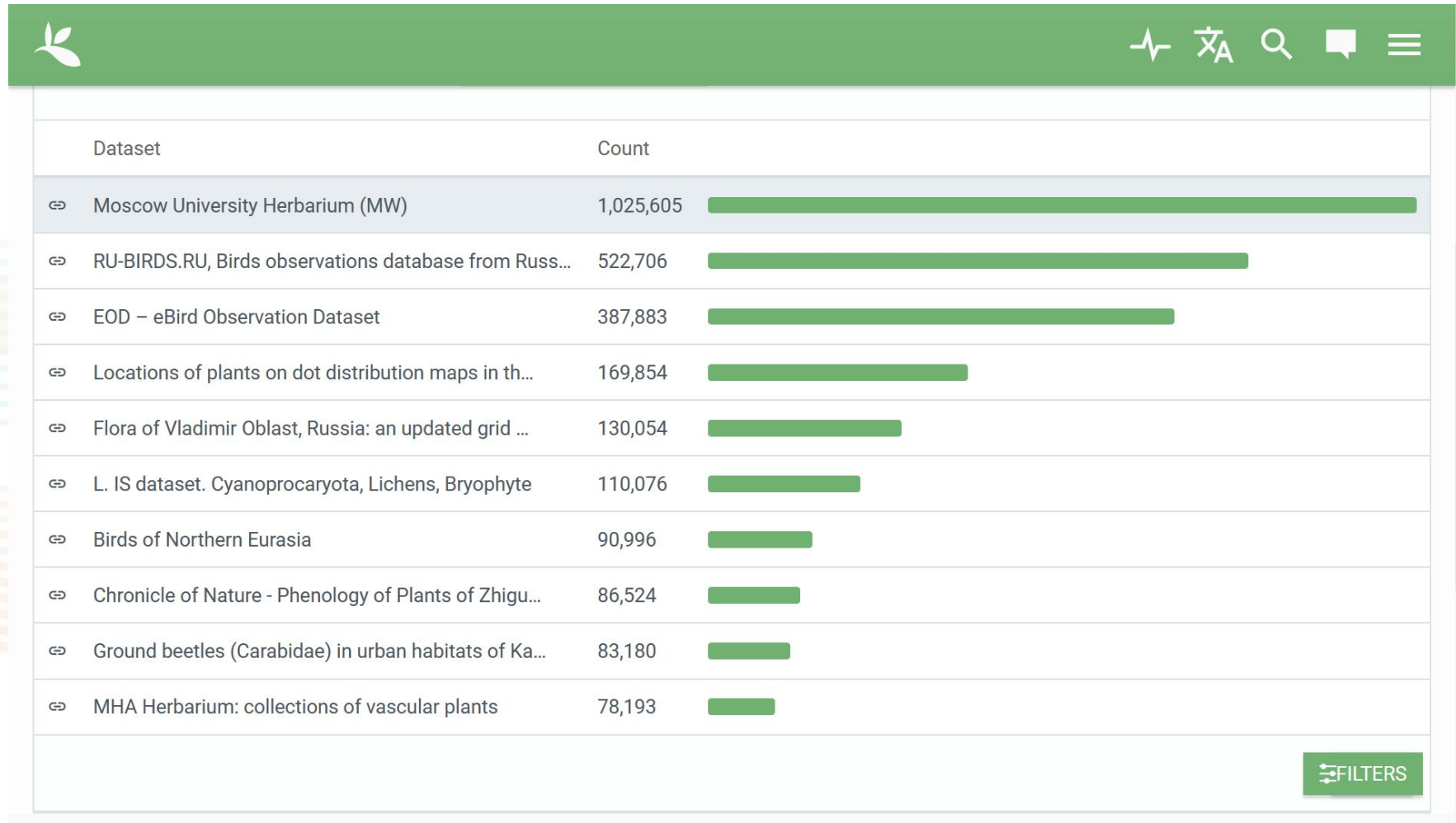
Sep 2021: 4.2M records



Aug 2019: 1.8M records



# Top sources from Russia in GBIF

A screenshot of the GBIF website showing a list of the top datasets from Russia. The interface has a green header bar with a leaf icon on the left and navigation icons (heart, text, search, chat, menu) on the right. The main content is a table with two columns: 'Dataset' and 'Count'. Each row includes a green bar chart representing the count. A 'FILTERS' button is visible in the bottom right corner of the table area.

Dataset	Count
↔ Moscow University Herbarium (MW)	1,025,605
↔ RU-BIRDS.RU, Birds observations database from Russ...	522,706
↔ EOD – eBird Observation Dataset	387,883
↔ Locations of plants on dot distribution maps in th...	169,854
↔ Flora of Vladimir Oblast, Russia: an updated grid ...	130,054
↔ L. IS dataset. Cyanoprocaryota, Lichens, Bryophyte	110,076
↔ Birds of Northern Eurasia	90,996
↔ Chronicle of Nature - Phenology of Plants of Zhigu...	86,524
↔ Ground beetles (Carabidae) in urban habitats of Ka...	83,180
↔ MHA Herbarium: collections of vascular plants	78,193

# Top 20 countries by plant data in GBIF



## Ranks 1 to 10



## Ranks 11 to 20



# Source #1 for the Russian flora: 1.2M



The screenshot shows the iNaturalist Research-grade Observations dataset page. At the top, there is a green navigation bar with links for 'Get data', 'How-to', 'Tools', 'Community', and 'About'. The main header area includes the text 'OCCURRENCE DATASET | REGISTERED FEBRUARY 9, 2012' and 'iNaturalist Research-grade Observations', published by iNaturalist.org and Ueda K. Below this, there are tabs for 'DATASET', 'METRICS', 'ACTIVITY', 'DOWNLOAD', and 'HOME PAGE'. On the right side, there are two buttons: '32,825,022 OCCURRENCES' and '1,491 CITATIONS'. The main content area contains a description of the dataset, the iNaturalist logo, and metadata such as 'Publication date: August 19, 2021' and 'Hosted by: iNaturalist.org'. Below the description, there are four circular progress indicators showing the percentage of data with specific attributes: 32,825,022 Occurrences (100%), 99.9% With taxon match, 99.7% With coordinates, and 99.9% With year. At the bottom, there is a map showing 32,738,186 georeferenced records, with a zoomed-in view of a region in Russia.

Get data How-to Tools Community About

OCCURRENCE DATASET | REGISTERED FEBRUARY 9, 2012

## iNaturalist Research-grade Observations

Published by [iNaturalist.org](https://iNaturalist.org)  
Ueda K

DATASET METRICS ACTIVITY DOWNLOAD HOME PAGE

32,825,022 OCCURRENCES 1,491 CITATIONS

Observations from iNaturalist.org, an online social network of people sharing biodiversity information to help each other learn about nature. iNaturalist is a joint initiative of the California Academy of Sciences and the National Geographic Society. Observations included in this archive met the following requirements: \* Published under one of the following licenses or waivers: 1) <http://creativecommons.org/publicdomain/zero/1.0/>, 2) <http://creativecommons.org/licenses/by/4.0/>, 3) <http://creativecommons.org/licenses/by/4.0/>... [More](#)

# iNaturalist

Publication date: August 19, 2021  
Metadata last modified: August 24, 2021  
Hosted by: [iNaturalist.org](https://iNaturalist.org)  
License: [CC BY-NC 4.0](https://creativecommons.org/licenses/by-nc/4.0/)  
[How to cite](#) DOI: [10.15468/ab3s5x](https://doi.org/10.15468/ab3s5x)




32,825,022 Occurrences 99.9% With taxon match 99.7% With coordinates 99.9% With year


32,738,186 GEOREFERENCED RECORDS


A map of Russia showing the distribution of georeferenced records. The map is color-coded, with red and orange areas indicating higher density of records, and yellow and green areas indicating lower density. The map is zoomed in to show a specific region in the southern part of Russia.

# «Flora of Russia» on iNaturalist




iNaturalist  Исследуйте Сообщество  Ещё  Вход или Регистрация




 New Flora of Russia • Новая флора России


## Подробнее

Участники  231

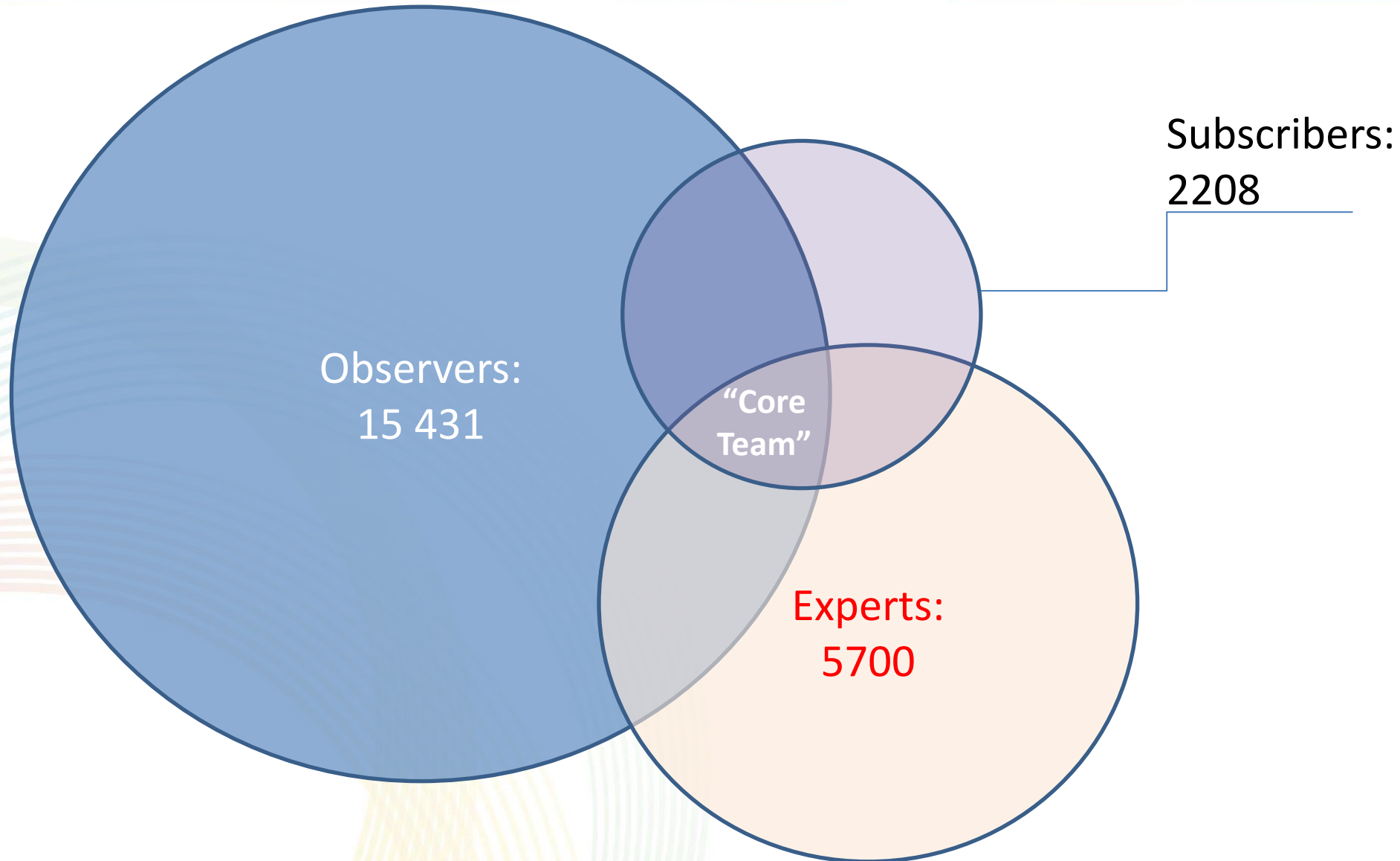
Проект "Флора России | Flora of Russia" достиг технологического потолка платформы iNaturalist: с середины марта 2021 г. главная страница портала перестала загружаться.

[Подробнее >](#)

 [Журнал проекта](#)

<a href="#">Обзор</a>	1 326 382 НАБЛЮДЕНИЙ	7 498 ВИДОВ	5 700 ЭКСПЕРТОВ	15 431 НАБЛЮДАТЕЛЬ	 <a href="#">Статистика</a>
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# Community of “Flora of Russia”





# Top observers on iNaturalist (Flora of Russia)



Alexey Seregin,  
**Moscow State University**



Nikolay Degtyarev,  
**Central Chernozem Reserve**



Nikolay Panasenko,  
**Bryansk State University**



Ekaterina Kashirina,  
**Moscow State University**



Sergey Appolonov,  
**Independent Res., Shumerlya**



Igor Pospelov,  
**Severtsov Institute, RAS**



Vladimir Teploukhov,  
**Omsk Forest Department**



Marina Gorbunova,  
**Independent Res., Korolyov**

# Top experts on iNaturalist (Flora of Russia)



**Dmitry Bochkov,  
Moscow State University**



**Igor Kuzmin,  
Tyumen State University**



**Sergey Mayorov,  
Moscow State University**



**Julia Shner,  
Moscow State University**



**Alexey Seregin,  
Moscow State University**



**Alexander Khimin,  
Pavlovsk School #2**



**Natalya Gamova,  
Moscow State University**

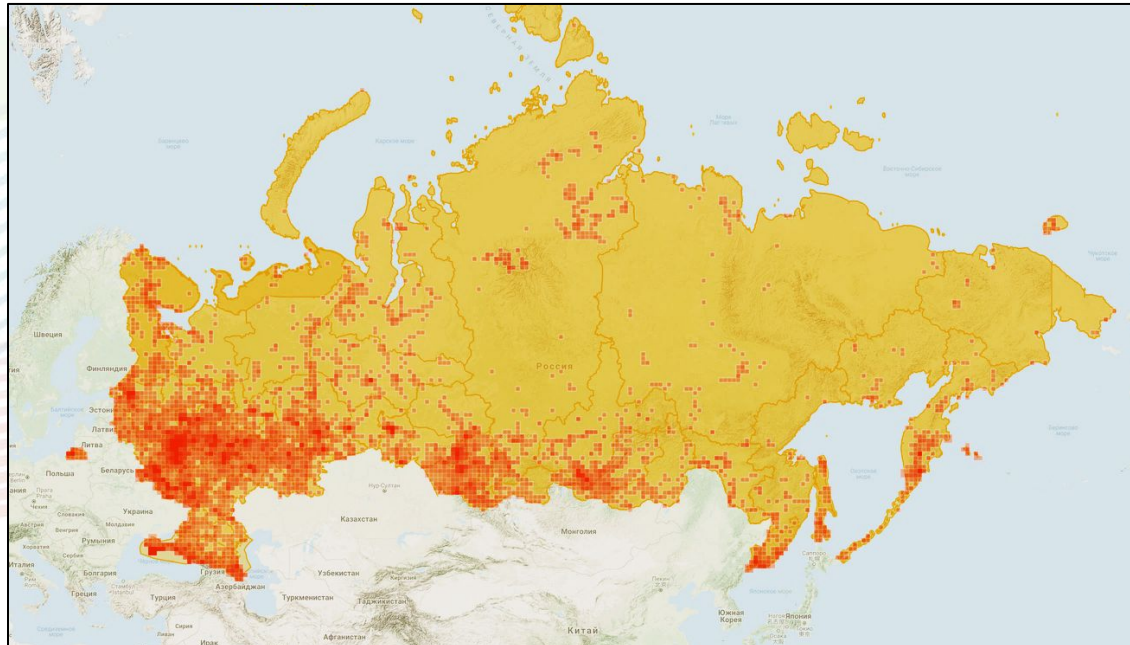


**Sergey Lednev,  
Moscow State University**

# Data density vs. Population density



## Data density on iNaturalist



## Population density of Russia



# Source #2 for the Russian flora: 0.6M



The screenshot shows the GBIF dataset page for the Moscow University Herbarium (MW). The page has a green header with navigation links: Get data, How-to, Tools, Community, About, and a search bar with a 'Login' button. Below the header, it states 'OCCURRENCE DATASET | REGISTERED NOVEMBER 2, 2017' and 'Moscow University Herbarium (MW)'. It is published by Lomonosov Moscow State University, Seregin A. The page includes a navigation bar with 'DATASET', 'PROJECT', 'METRICS', 'ACTIVITY', 'DOWNLOAD', and 'HOME PAGE'. On the right, it displays '1,025,605 OCCURRENCES' and '424 CITATIONS'. The main content area contains a description of the herbarium, a project ID (14-50-00029, Russia2019\_14), publication date (September 1, 2021), metadata last modified date (September 1, 2021), host (Lomonosov Moscow State University), and license (CC BY 4.0). Below this, there are four circular progress indicators: 1,025,605 Occurrences (100%), 99.9% With taxon match, 58% With coordinates, and 87% With year. At the bottom, it shows '591,860 GEOREFERENCED RECORDS' and a world map with numerous yellow and orange dots representing the distribution of specimens, primarily concentrated in Europe and Asia.

# Herbarium collections: top countries



1.	USA	78,462,700
2.	France	24,046,688
3.	UK	23,655,232
4.	Germany	22,120,100
5.	People's Republic of China	20,375,136
6.	<b>Russia</b>	<b>16,175,934</b>
7.	Japan	12,860,724
8.	Sweden	12,033,000
9.	Switzerland	12,027,534
10.	Italy	11,596,611



Source: Thiers (2021)

[http://sweetgum.nybg.org/science/wp-content/uploads/2021/01/The\\_Worlds\\_Herbaria\\_2020.pdf](http://sweetgum.nybg.org/science/wp-content/uploads/2021/01/The_Worlds_Herbaria_2020.pdf)

# Digitization of herbaria in Russia



## Russia:

- 16,176,000 physical specimens
- 1,309,000 imaged
- **7,8% imaged**



## World:

- 396,205,000 physical specimens
- ca. 62,000,000 imaged
- **15,6% imaged**



# Top herbarium collections of Russia



	<b>Institution</b>	<b>Code</b>	<b>Collections</b>
1	Komarov Botanical Institute, RAS (St Petersburg)	LE	6,000,000
2	Moscow State University	MW	1,044,751
3	Central Siberian Botanical Garden, SB RAS (Novosibirsk)	NS + NSK	800,000
4	Saint Petersburg University	LECB	800,000
5	Main Botanical Garden, RAS (Moscow)	MHA	610,000
6	Institute of Biology and Soil Science, FEB RAS (Vladivostok)	VLA	500,000
7	Tomsk State University	TK	500,000
8	Komi Scientific Centre, RAS (Syktyvkar)	SYKO	407,000
9	Vavilov Institute of Plant Genetic Resources (St Petersburg)	WIR	376,825
10	Southern Federal University (Rostov-on-Don)	RV	350,000

Source: Thiers (2021)

[http://sweetgum.nybg.org/science/wp-content/uploads/2021/01/The\\_Worlds\\_Herbaria\\_2020.pdf](http://sweetgum.nybg.org/science/wp-content/uploads/2021/01/The_Worlds_Herbaria_2020.pdf)

# Top digital herbaria of Russia



	Institution	Code	Images	Proportion of imaged specimens	Web-portal
1	Lomonosov Moscow State University (Moscow)	MW	1,029K	94%	<a href="https://plant.depo.msu.ru/">https://plant.depo.msu.ru/</a> <a href="https://www.gbif.org/">https://www.gbif.org/</a>
2	Main Botanical Garden, RAS (Moscow)	MHA	78K	13%	<a href="https://plant.depo.msu.ru/">https://plant.depo.msu.ru/</a> <a href="https://www.gbif.org/">https://www.gbif.org/</a>
3	Central Siberian Botanical Garden, RAS (Novosibirsk)	NS+ NSK	52K	7%	<a href="http://84.237.85.99:8081/">http://84.237.85.99:8081/</a> <a href="https://www.gbif.org/">https://www.gbif.org/</a>
4	Komarov Botanical Institute, RAS (Saint Petersburg)	LE	44K	<1%	<a href="http://herbariumle.ru/">http://herbariumle.ru/</a>
5	Botanical Garden-Institute, RAS (Vladivostok)	VBGI	42K	53%	<a href="http://botsad.ru/herbarium/">http://botsad.ru/herbarium/</a>
6	Institute of Plant and Animal Ecology, RAS (Yekaterinburg)	SVER	18K	14%	<a href="https://herbarium.ipae.uran.ru/">https://herbarium.ipae.uran.ru/</a>
7	Altai State University (Barnaul)	ALTB	17K	6%	<a href="http://old.ssbg.asu.ru/">http://old.ssbg.asu.ru/</a>
8	Tula State Pedagogical University (Tula)	TUL	9K	86%	<a href="https://plant.depo.msu.ru/">https://plant.depo.msu.ru/</a> <a href="https://www.gbif.org/">https://www.gbif.org/</a>



# Source #3 for the Russian flora: 0.3M



Get data How-to Tools Community About

OCCURRENCE DATASET | REGISTERED FEBRUARY 25, 2020

## Locations of plants on dot distribution maps in the Flora of Siberia (Flora Sibiraea, 1987–1997)

Published by [Central Siberian Botanical Garden SB RAS](#)  
Artemov I • Egorova A

DATASET PROJECT METRICS ACTIVITY DOWNLOAD

169,854 OCCURRENCES 32 CITATIONS

In 1987-1997 the 13 volumed collective monograph Flora of Siberia was published where data on systematics, ecology and distribution of 4302 native and naturalised alien vascular plant species and subspecies were presented (Flora Sibiraea, 1987–1997). Dot distribution maps for 2569 of them were made by authors of the monograph on the base of specimens stored in herbaria of Novosibirsk (NS, NSK), Tomsk (TK), Moskow (MW, MHA) and Saint Petersburg (LE). The total number of locations on the maps are 169854. The resource contains coordinates of the locations which were geocoded by means of the standard ArcView GIS procedures.

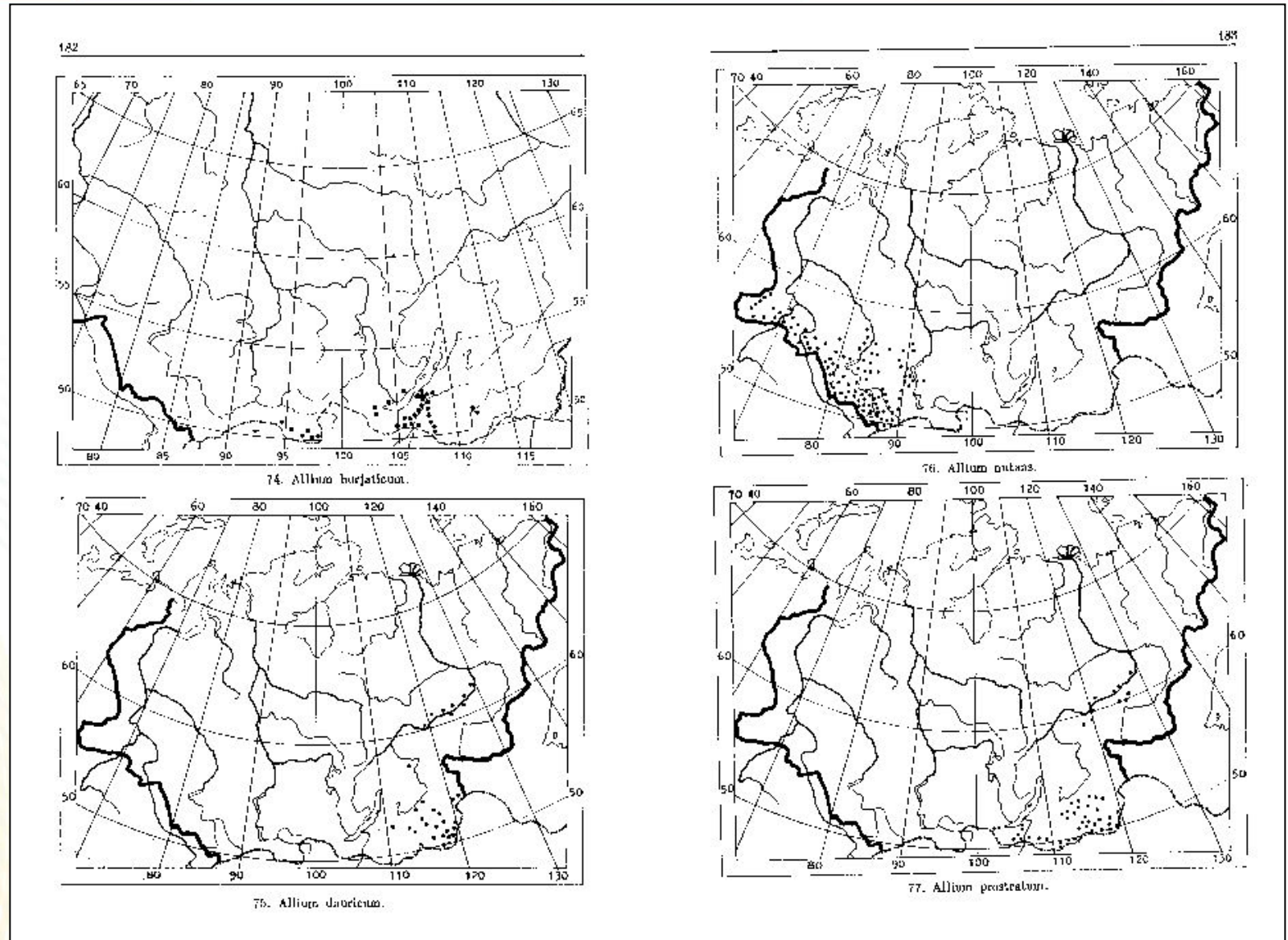
**Project ID:** AAAA-A17-117012610055-3  
**Publication date:** April 13, 2021  
**Metadata last modified:** April 13, 2021  
**Hosted by:** [Central Siberian Botanical Garden SB RAS](#)  
**License:** [CC BY 4.0](#)  
[How to cite](#) [DOI](#) 10.15468/jb84wg

169,854 Occurrences    100% With taxon match    99.9% With coordinates    100% With year

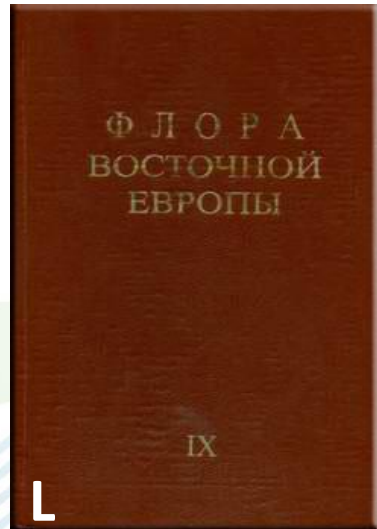
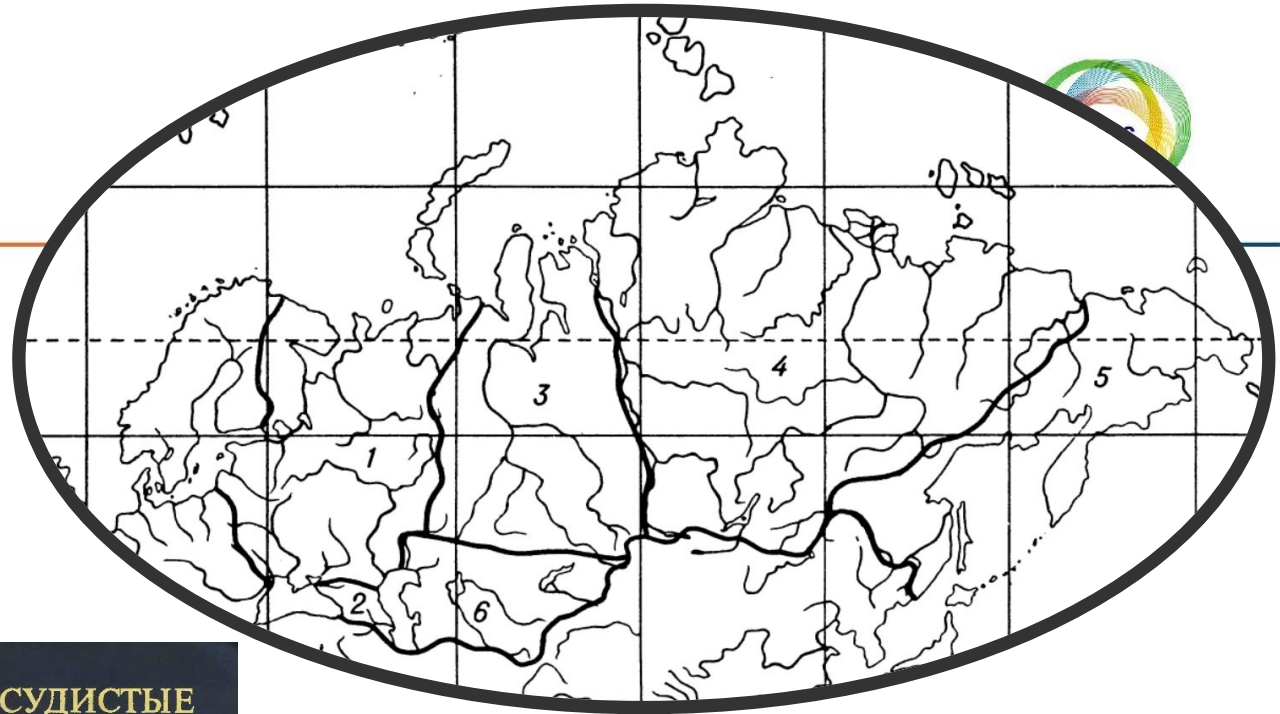
169,772 GEOREFERENCED RECORDS

A map of Siberia with numerous yellow and orange dots representing plant locations. The dots are densely packed across the region, with some red dots scattered throughout. The map includes a zoom control on the left side.

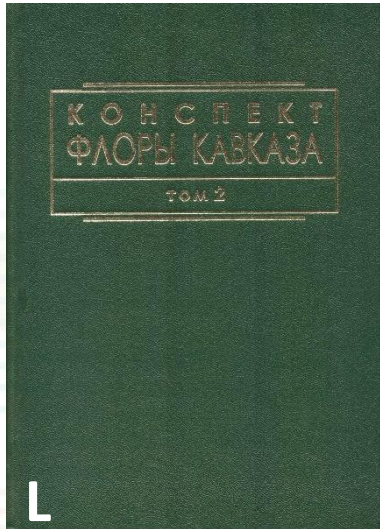
# Published distribution maps



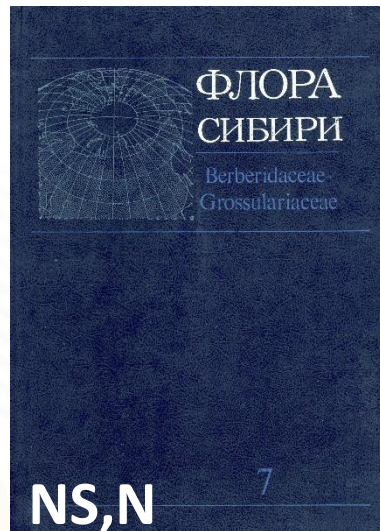
# Five standard floras



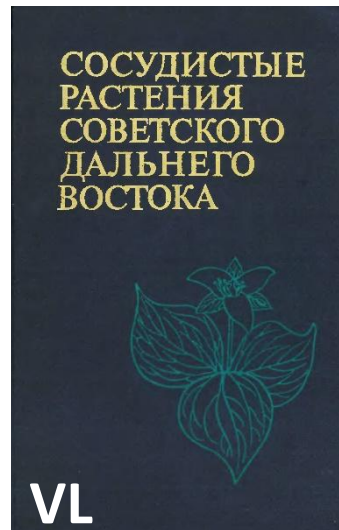
Area 1  
1974-2004



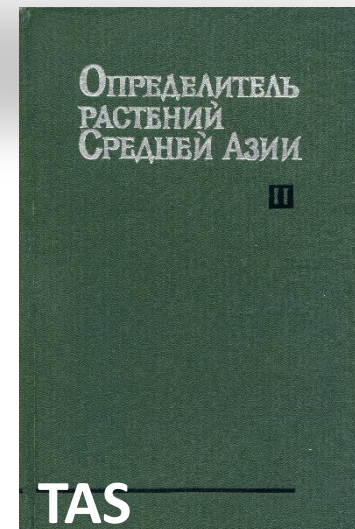
Area 2  
2003-[2021]



Areas 3,4  
1988-2003

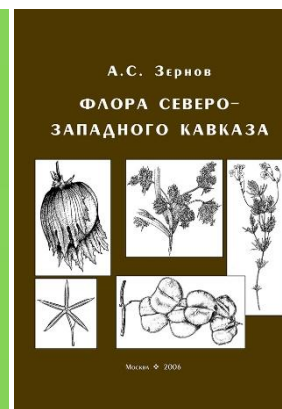
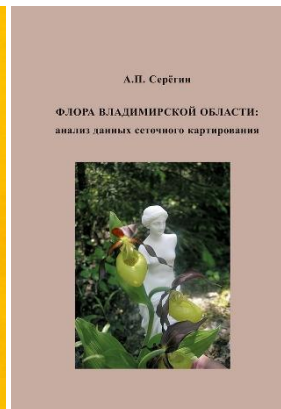
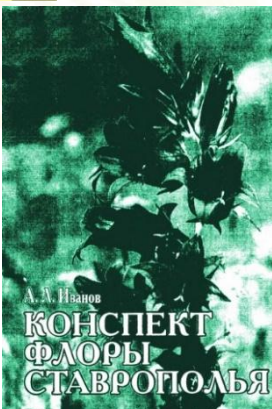
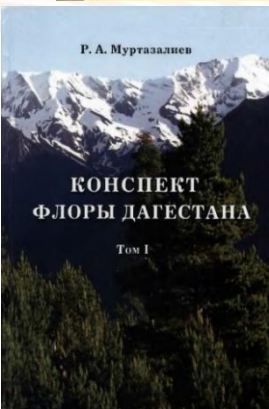
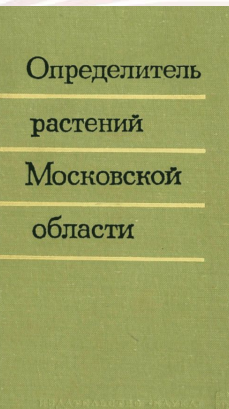
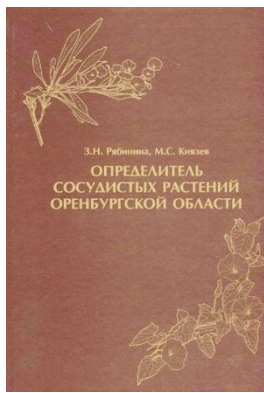
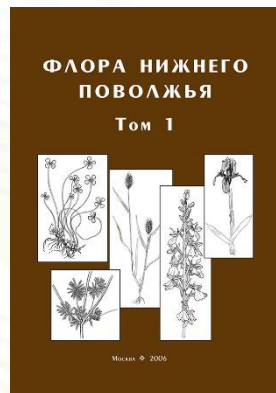
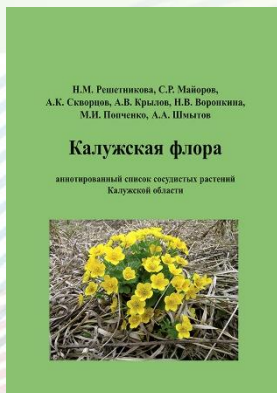
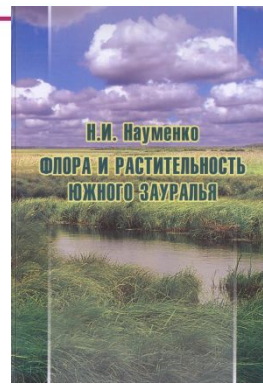
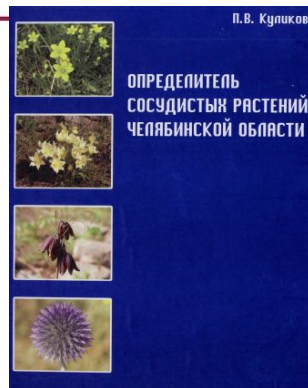
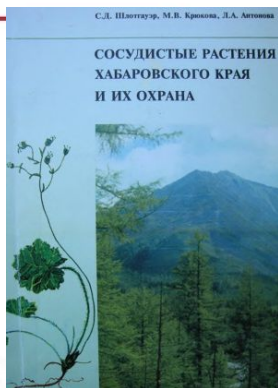


Area 5  
1985-2006

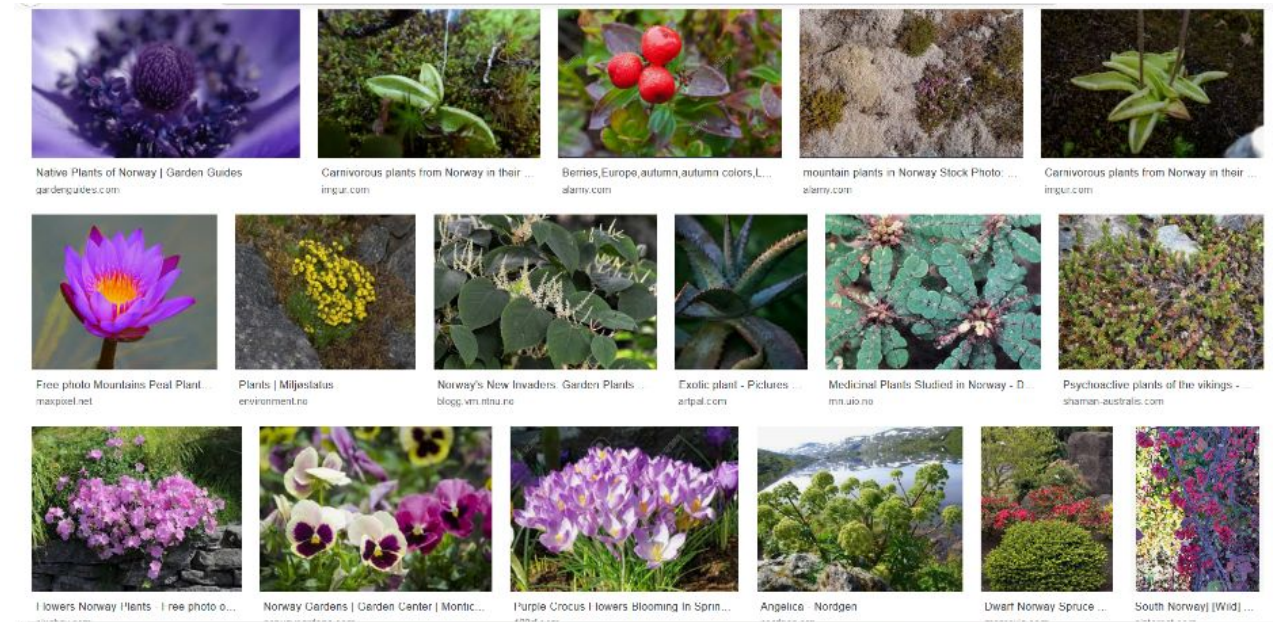
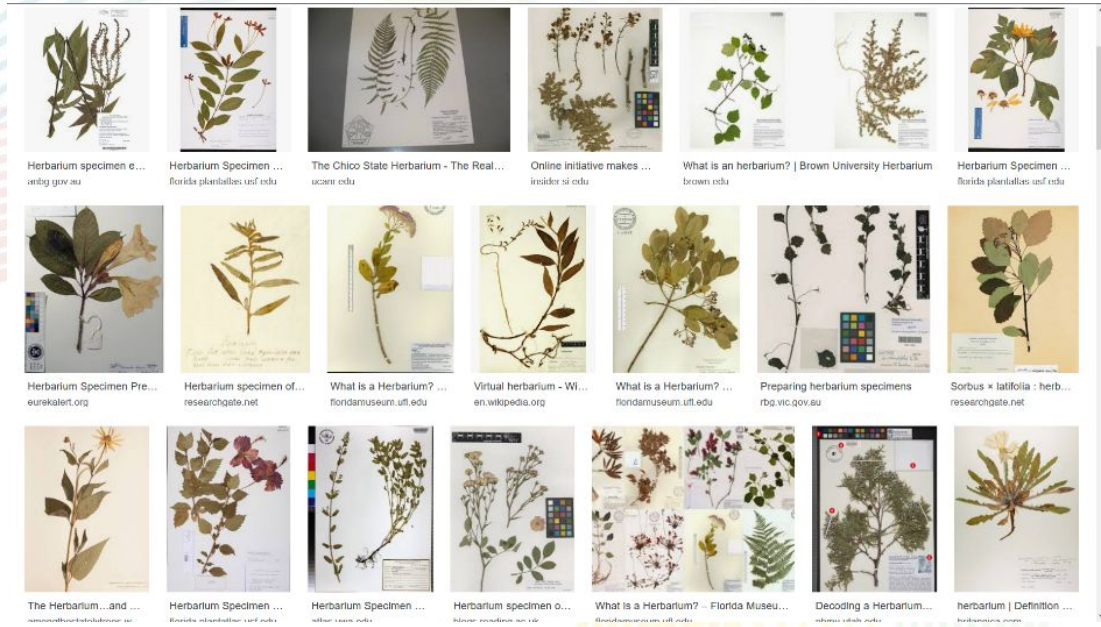
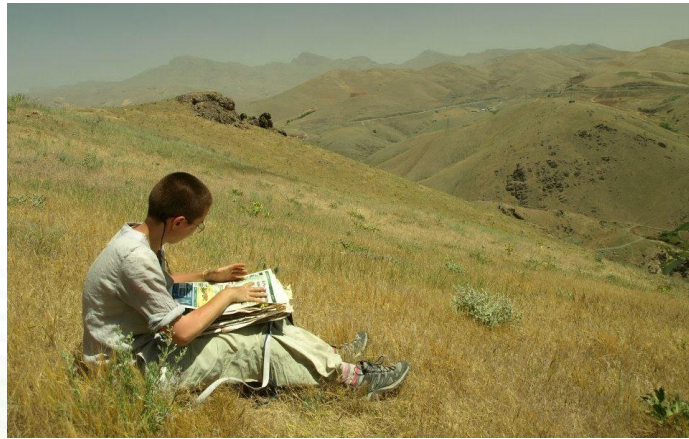


Area 6  
1968-19

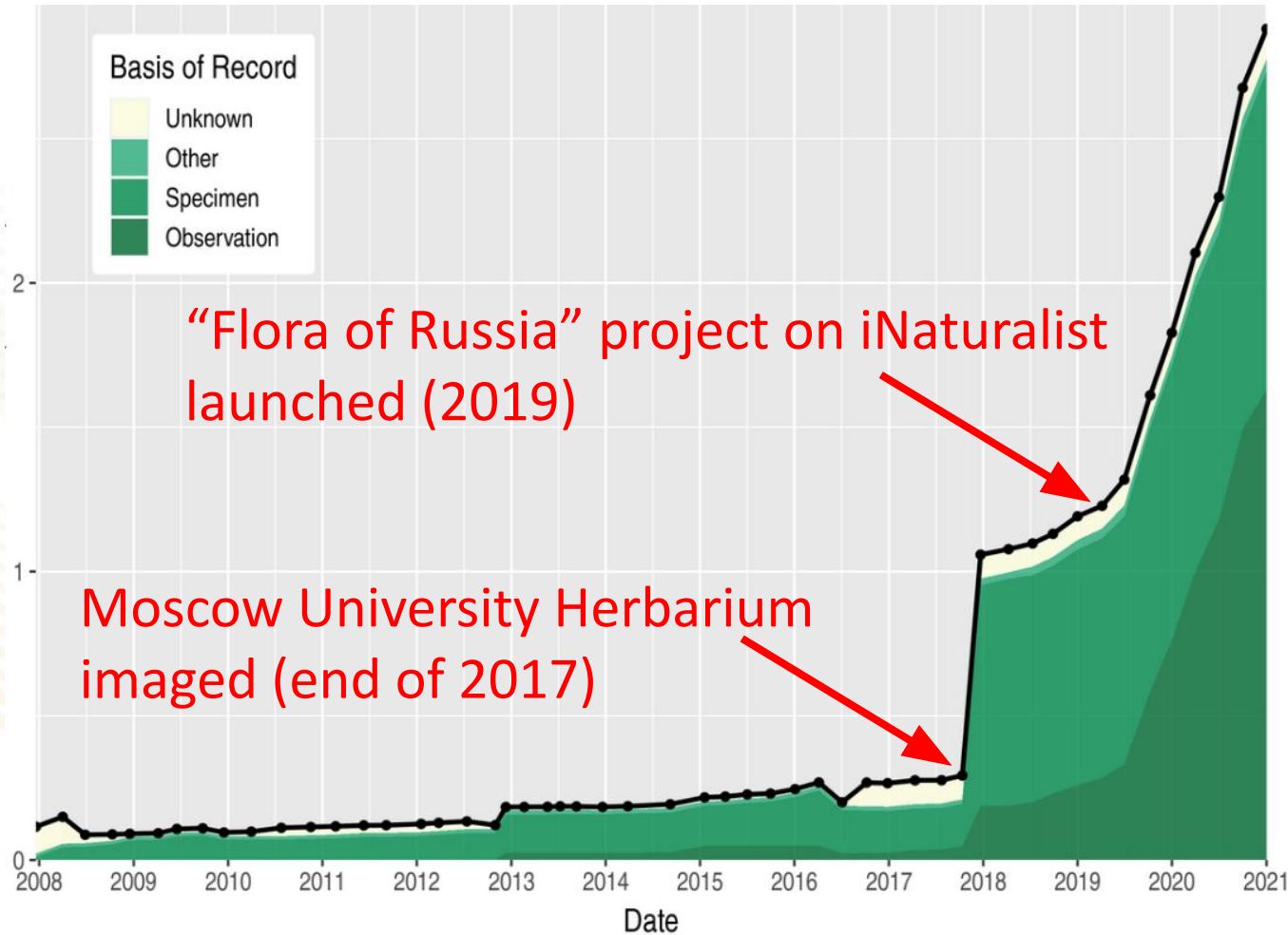
# Regional floras, guides, checklists



# Specimens vs. Citizen Science



# Data growth on Russian plants in GBIF





可持续发展大数据国际论坛  
International Forum on Big Data for  
Sustainable Development Goals

# Thanks

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