

FloraGREIF

A Virtual Flora of Mongolia



Greifswald's Digital Information System of the Flora of Mongolia

Institute of Geography and Geology, Institute of Botany and Landscape Ecology
& Computer Centre, University of Greifswald

GIS-IDEAS 9-11 December, 2010
Hanoi, Vietnam

Mongolia ?

A map of Mongolia with various landscape photos overlaid and a sidebar with demographic information.

Area Total : 1,564,116 km²

Population
Dec.2009 est.: 2,736,800

Density : 1.75/km²

<http://en.wikipedia.org/wiki/Mongolia>

DFG **MOSKITO**

0 KM 400 800

118.54, 62.26 dd

Mongolia

China

South-Korea

Photos (from top left to bottom right):
1. Aerial view of a dry, hilly landscape.
2. A wide, flat plain with low-lying shrubs and distant mountains.
3. A close-up of a rocky, arid ground surface.
4. Aerial view of a winding river or stream bed.
5. Herd of animals grazing in a valley with mountains in the background.
6. A wide, flat plain with low-lying shrubs and distant mountains.
7. A close-up of a rocky, arid ground surface.
8. A wide, flat plain with low-lying shrubs and distant mountains.
9. A steep, rocky hillside covered in sparse vegetation.
10. A wide, flat plain with tall grasses and distant mountains.



Background

- Russian literature & language skills available (still)

Uyghurjin script

ئۇيغۇرچە · ئۇيغۇرچىنىڭ ئۇيغۇر ئەمپۇرىيەتلىك ئۆسۈزى:



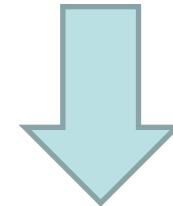
Background



- Large herbaria collections from Mongolia in Germany



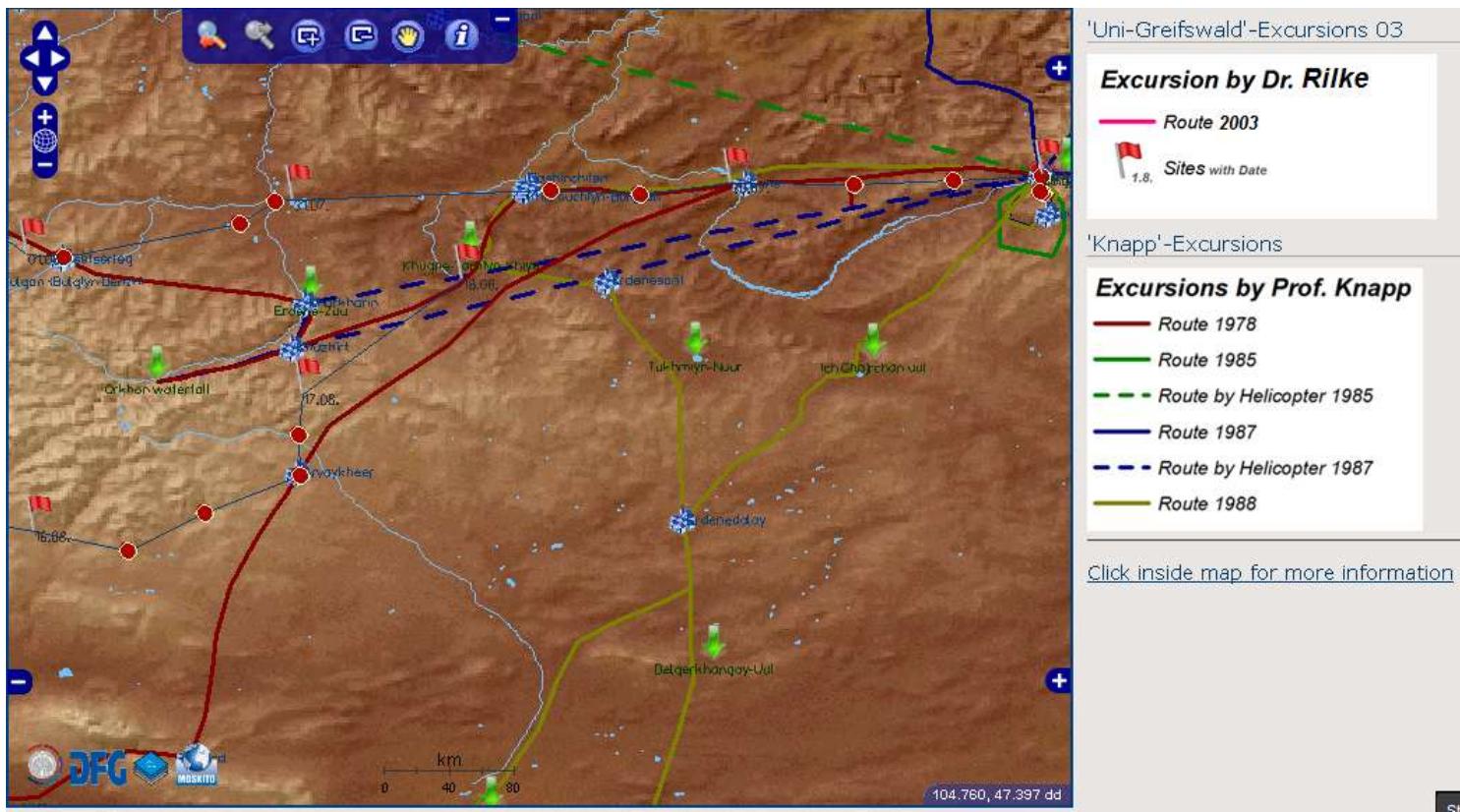
Herbarium of Berlin
Herbarium of Gadersleben
Herbarium of Jena
Herbarium of Greifswald



FloraGREIF

Background

- Long term research experience in Mongolia since the 1970s in Greifswald University and other institutions in (former East) Germany



Map from WEB-GIS with layers travellogs

Objectives

- **Main target groups**

Ecologists, specialists in plant taxonomy, students of biological sciences, amateur botanists

- **Main targets**

Fast information access, plant determination, supporting taxonomic revisions

- **How?**

Internet database, digital images, WebGIS application

FlorGREIF Components



Database

- 2858 Mongolian plant species
- 4647 plant records



Photo Library

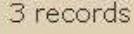
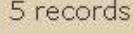
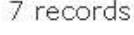
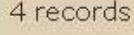
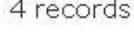
- 761 scans of herbarium samples
- 923 with species photos
- 216 with macro photos
- 726 with habitat photos



WebGIS

- Elevation Maps
- Distribution Maps
- Satellite Images
- Geobotanical Units
- Vegetation Zones
- Topographic Maps
- and more

Virtual Flora of Mongolia

| Home | Search Plants | WebGIS | Technical Terms | Literature | Further Information |
|---|---|---|---|---|---|
| Get an Overview | 52 taxa found for Alliaceae 1 - 10  | | | | |
| Targeted Search | | | | | |
|  Taxon data | Scientific Name <i>Allium altaicum</i> Pall. Alliaceae | Synonym A. platyspathum ssp. amblyophyllum Kar. et Kir. acc. to: Friesen 1995, 2001; Gubanov 1996 A. platyspathum auct. non Schrenk: Egorova 2003: 62, p.p. acc. to: Friesen 1995 |  3 records |   |  |
|  Records | <i>Allium amblyophyllum</i> Kar. et Kir. Alliaceae | | | | |
|  Herbar scans | <i>Allium amphibolum</i> Ledeb. Alliaceae | |  5 records |    |  |
|  Species photos | <i>Allium anisopodium</i> Ledeb. Alliaceae | |  7 records |    |  |
|  Habitat photos | <i>Allium austrosibiricum</i> N. Friesen Alliaceae | A. senescens auct. non L.: Egorova 1977/2003, Grubov 1982/2001 acc. to: Friesen 1995 A. spirale Willdenow acc. to: Xu Jiemei & Kamelin 2000 |  4 records |   |  |
|  | <i>Allium bidentatum</i> Fisch. ex Prokh. Alliaceae | A. omiostema Airy Shaw acc. to: Friesen 1995 |  4 records |   |  |
| FloraGREIF project is in progress. Let us know what we can do better. | | <i>A. schrenkii</i> auct. non | | | |

Home Search Plants WebGIS Technical Terms Literature Further Information

Get an Overview

Targeted Search

 Taxon data
 Records
 Herbar scans
 Species photos


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Family: Alliaceae

For Mongolia the key of N. Friesen (1995) and for former Soviet Central Asia the use of the "Flora of Siberia / 4 / Araceae - Orchidaceae" (1987/2001) is highly recommended. 

Scientific name: **Allium malyschevii N. Friesen**

Source: Gubanov 1996, not in Grubov 1982/2001

Synonym: A. amphibolus auct. non Ledeb.: Grubov 1982/2001: 65/127 p.p.
(acc. to Friesen 1995)

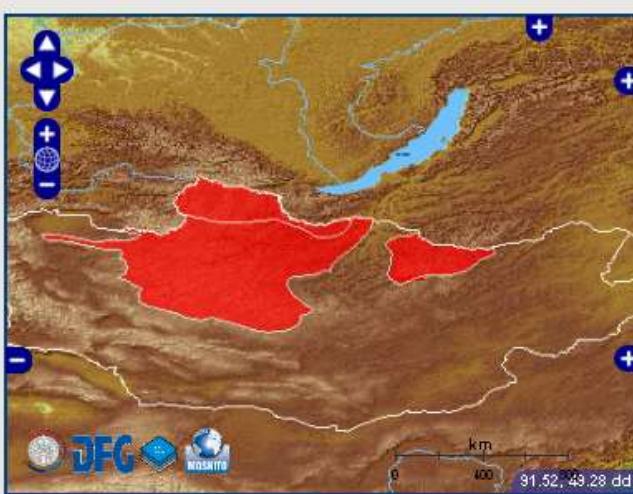
Description: Bulbs several on distinct rhizome, cylindrical- conical, 5-9 cm long, with grayish-brown reticulate-fibrous tunic; scape 15-30 cm tall, covered at very base with erubescence leave sheaths; 2 leaves, linear, flat, narrowed towards base and tip, falcate, obtuse, slightly shorter than or as long as scape; umbel globose, rarely subhemispherical, compact, capitate; pedicels slightly longer than perianth; perianth lobes bright purple; filaments 1.5 times longer than perianth lobes, inner filaments with 2 acute, often bifid teeth.
(acc. to Friesen 1987/2001)

Confuse with: Allium amphibolus Ledeb., A. pumilum Vved.

Comments: A. malyshevii: scape covered at very base with erubescence leave sheaths (difficult to separate mentioned species by means of this property, cf. herbar scans); inner filaments with 1, often bifurcate tooth at each side. A. amphibolus & A. pumilum: scape covered 1/3 - 1/2 with leave sheaths; inner filaments with 1 short tooth at each side or undentate.

Distribution: Khubsugul, Khentei, Khangai (acc. to Gubanov 1996)

[open map in a new window!](#)



Habitat: In alpine meadows, in grassy stony slopes, in alpine belts (Friesen 1995).

[Home](#)[Search Plants](#)[W](#)[Get an Overview](#)[Targeted Search](#)

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we can do better.

Family

Collector

[Taxon](#)[Record](#)

Distributed:

 cedarpine cedarpine-larch clayey clayey-debris clearings cliffs coastal coasts coniferous creek crevices crops damp

Habitat:

Status:

Red list:

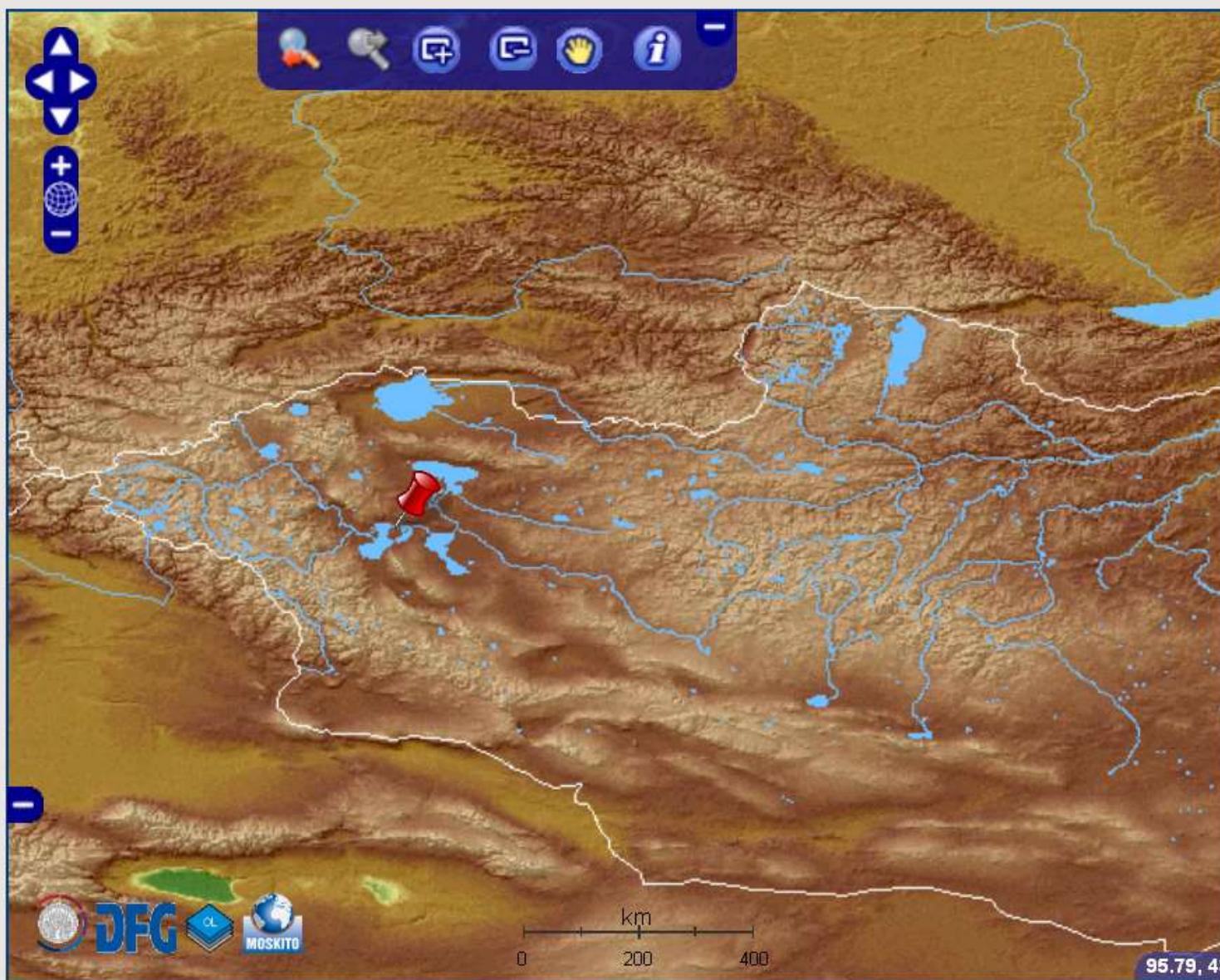
Growth form:

[Overview](#)[Literature](#)[Further Information](#)

Coordinates:

Geogr. Coord. 92.5258 (lon) 48.2742 (lat) decimal

[hide map](#)



[Click inside map for more information](#)

| Home | Search Plants | WebGIS | Technical Terms | Literature | Further Information |
|---|---|---------|---------------------------|---|---------------------|
| Get an Overview Targeted Search  Taxon data  Records  Herbar scans  Species photos  Habitat photos | 1 taxa found for alliu mong Scientific Name <i>Allium mongolicum</i> Turcz. ex Regel Alliaceae | Synonym | Record Data 20 records | Image Data  | |

FloraGREIF project is in progress.
Let us know what we can do better.

Virtual Flora of Mongolia

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FloraGREIF project
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Let us know what
we can do better.

12 records for Polygonaceae *Calligonum mongolicum* 1 - 10[Calligonum spec.](#) [Polygonaceae spec.](#)

| Identified as | Editor | Coll. no | Date | Images |
|------------------------------|--|------------------|------------|--------|
| <i>Calligonum mongolicum</i> | Leg: Anne Zemmrich Teste: Rolf Wisskirchen | AZ 030 | 09.08.2003 | |
| <i>Calligonum mongolicum</i> | Leg: K.-F. Günther et M. Schnittler Teste: Zemmrich, Anne | 27809 | 29.08.2007 | |
| <i>Calligonum mongolicum</i> | Leg: C. Davazhamc & P. Hanelt Teste: Zemmrich, Anne | 1070 | 18.06.1962 | |
| <i>Calligonum mongolicum</i> | Leg: S. Danert, C. Davazhamc, P. Hanelt & Ch. Sanchir Teste: Zemmrich, Anne | 3697 | 11.07.1964 | |
| <i>Calligonum mongolicum</i> | Leg: Exkursion, S. Rilke Teste: Zemmrich, Anne | 249a | 14.08.2003 | |
| <i>Calligonum mongolicum</i> | Leg: Anne Zemmrich Teste: Rolf Wisskirchen | AZ 812 | 09.08.2003 | |
| <i>Calligonum mongolicum</i> | Leg: Karsten Wesche Teste: Zemmrich, Anne | 2004 - 24 572 | 8.07.2004 | |
| <i>Calligonum mongolicum</i> | Leg: Anne Zemmrich Teste: Rolf Wisskirchen | 32/2005 | 14.09.2005 | |
| <i>Calligonum mongolicum</i> | Phot: M. Schnittler Teste: Zemmrich, Anne | photo | 11.08.2003 | |

RECORD images: Herbar Scans



+- ← ↑ ↓ → ⌂ ▲



RECORD images: habitats, habitus, details



| | |
|---|--|
| Sazes | Habitats with constant regime of moistening by groundwaters in dry regions of Central Asia |
| Schistose (schistose slopes) | From schist, a group of medium-grade metamorphic rocks, a kind of slate |
| Sheep's-fescue | <i>Festuca ovina</i> L. (and related microspecies) |
| Solonchaks | Alkaline soil with saline crust on its surface in a semi-/arid climate |
| Solonetz | Alkaline clayey sodium soils with swelling and shrinking dynamics in a semi-/arid climate |
| Sondoks | Saline soils |
| Spur (tops of spurs) | Foothills, rock overhang |
| Tailing (upper parts of tailings) | Originally means coarse sediment, partly applied for pediment, similar to 'bel' |
| Tailing, proluvial | Coarse to fine sediment accumulated at the foot of a slope building a deltaic lobe, created by weathering of the rocks |
| Takyr | Soil or surface of clayey soils forming a dry crust with shrinking fissures on the surface, often with cyanobacteria layers when wet |
| Takyred (takyred depressions, lowlands) | Refers to the dried crust with shrinking fissures at its surface, often heavily saline |
| Talus | Surface of broken rocks found on mountain slopes and at the base of cliffs (pieces usually of larger size than scree) (Pyak et al. 2008) |

- [Administrative Division of Mongolia](#)

(Data Sources: Tserennyam 2007a, b)

All geographical names are transcribed from the Mongolian original spelling acc. to Encyclopaedia Britannica, Inc. (1997) and UNGEGN: United Nations Group of Experts on Geographical Names (2003).

- [Mongolian Provinces and Province Capitals](#)

(Data Sources: Tserennyam 2007a, b)

All geographical names are transcribed from the Mongolian original spelling acc. to Encyclopaedia Britannica, Inc. (1997) and UNGEGN: United Nations Group of Experts on Geographical Names 2003).

- [Main Geographical Region of Mongolia based on Mongolia's National Atlas \(Akademiya Nauk SSSR & Akademiya Nauk MNR 1990\).](#)

They are used for locality data of plant records within the FloraGREIF database.

All geographical names are transcribed from the Mongolian original spelling acc. to Encyclopaedia Britannica, Inc. (1997) and UNGEGN: United Nations Group of Experts on Geographical Names (2003) except for internationally accepted names.

- [Geobotanical Region of Mongolia - Basis of Distribution Data \(acc. to Grubov 1955\)](#)

All geographical names are transcribed from the Mongolian original spelling acc. to Encyclopaedia Britannica, Inc. (1997) and UNGEGN: United Nations Group of Experts on Geographical Names (2003).

FloraGREIF Additions

- Cited references
- Transcription Guideline
- Geographic references
- Literature list
- Linklist to virtual herbariums
- Photo collection
- Data export for authorized users (standard list format e.g. txt, csv, xml, xls)
- and more

| Home | Search Plants | WebGIS | Technical Terms | Information |
|-----------------|---|--------|-----------------|-------------|
| Team | search for author/title/keywords: <input type="text"/> Go | | | |
| Cooperation | in Cited Literature: | | | |
| Literature List | <p>Author: Baikov, K.S. Title: Empetraceae in Flora Siberia. Vol. 10, Science Publisher Enfield. Published: (73-74) 2006</p> <p>Author: Baum, Bernhard R. Title: The Genus Tamarix Published: (209) Jerusalem 1978</p> <p>Author: Bjazrov, L.G., Ganbold, Z., Gubanov, I.A. & Ulziykhutag I. Title: Flora Khangaya Published: Leningrad 1989</p> <p>Author: Byazrov, L. G.; Ganbold, E.; Gubanov, I. A.; Ulziykhutag, N.; Title: Flora Khangaya [The flora of Khangay Mts.] Published: Biologicheskie Resursy I Prirodnye Usloviya Mongolskoy Narodnoy Respubliki Leningrad 1989</p> <p>Author: Byazrov, L.G., Gubanov, I.A., Ganbold, E., Dulgerov, A.N., Tsegmed, T. Title: Flora vostochnogo Khangaya. [Flora of the Eastern Khangay] Keywords: Biogeography - Chorology, Flora, Khangay, Lichens, Mosses, Synonymity, Taxonomy & Systematics, Vascular Plants, Published: Biologicheskie Resursy I Prirodnye Usloviya Mongolskoy Narodnoy Respubliki, 20 Moskva 1983</p> <p>Author: Dulamsuren, C. Title: Floristische Diversität, Vegetation und Standortbedingungen in der Gebirgsstaiga des Westkhentei_Nordmontanei</p> | | | |

FloraGREIF - WebGIS

Web Mapping Service

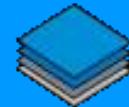
Moskito-GIS



OGC
konform

Web Client

Open Layers



Open Source/
modified

Content Management System

Word-Press



Open Source

Database

MySQL



Open Source

Web-Processing

JS,PHP,JSON,AJAX



Open Source

Web-Server

Apache



Open Source

Implementation of FloraGREIF

- Extend CMS GREIF-GeoGREIF to FloraGREIF:
 - Add subject-specific components: taxon, record, image data
 - Add Search engine and choose an adequate viewer, file size of approx. 200 MB (ZOOMIFY)
 - Add WebGIS functionality

[Home](#) [Search Plants](#) [Technical Terms](#) [Information](#)

[Get an Overview](#)[Targeted Search](#)[WebGIS](#)[Map Search](#)[Taxon data](#)[Records](#)[Herbar scans](#)[Species photos](#)[Habitat photos](#)

FloraGREIF project
is in progress.
Let us know what
we can do better.

Polygonaceae ***Aconogonon alpinum* (All.) Schur**

Collected by: Anne Zemmrich, 18.07.2002, Coll.No. AZ 636

Determined by: Oyuunchimeg Damdinsürengiyn, Summer 2002

Confirmed by: Anne Zemmrich, Feb 04

Flowering status: flowering plant with seeds

Remarks written on herbar label: companion of relevé 20-25

Herbarium: GFW Acc. No.: 38673

**Images**

leaf and stem
photo by: FloraGREIF:
D.Pietzsch



ochrea with adpressed
bristles
photo by: FloraGREIF:
D.Pietzsch



ochrea with adpressed
bristles
photo by: FloraGREIF:
D.Pietzsch

Country: Mongolia

Province: Khovd

District: Khovd

Geogr. Region: Mongolian Altai

Locality: 12 km ssw of sum centre Dund-Us, westerly beside of road
between sum centre Dund-Us and centre of former Brigade
No. 3

Coordinates: Geo. Coo. 91.328279 (lon) 48.027374 (lat) decimal WGS 84

[show map](#)

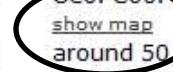
GPS number: around 50 and 51 (50)

Altitude: 2342 m asl

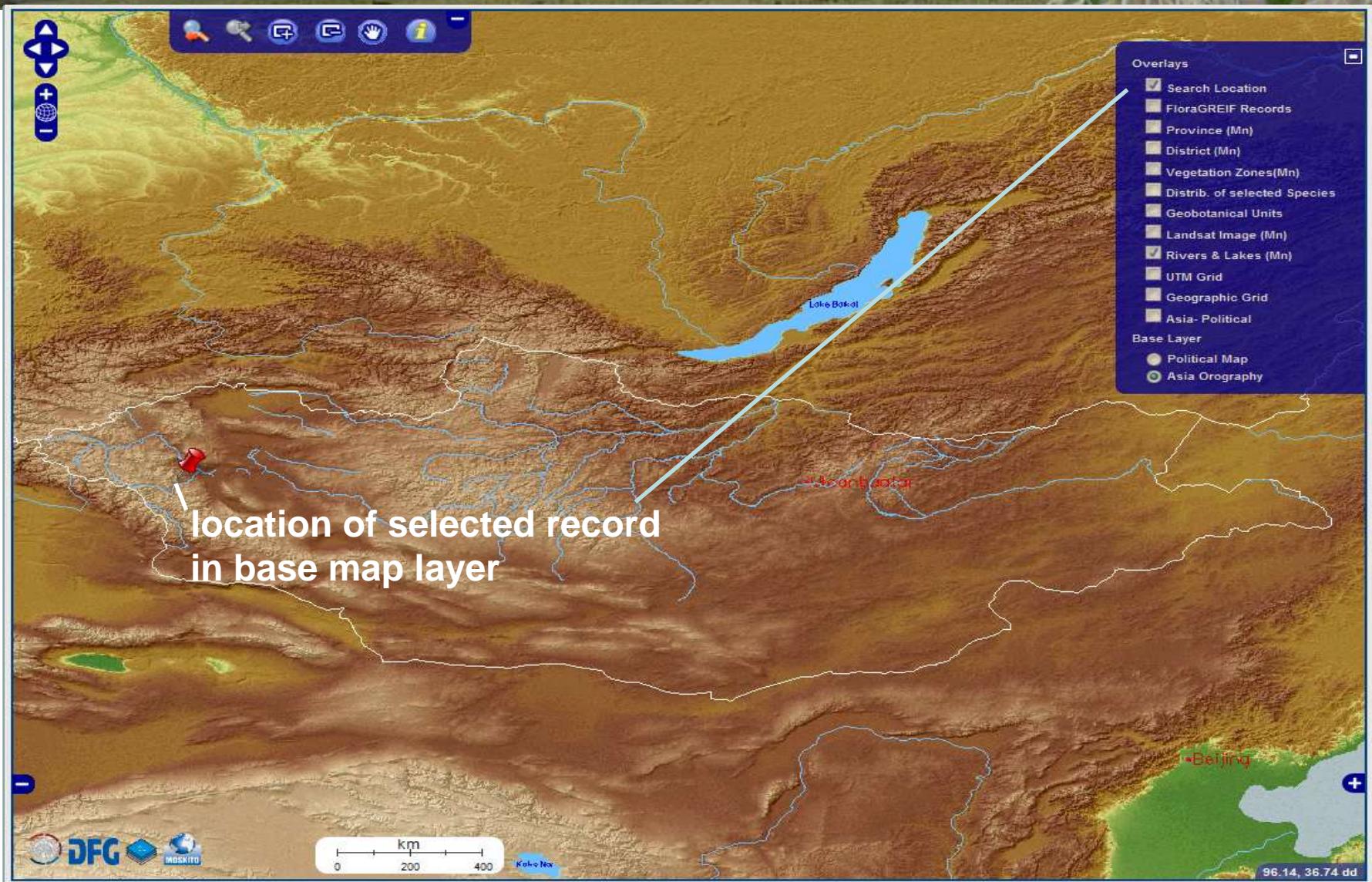
Habitat: alpine steppe, companion of Aster alpinus-Koeleria cristata-alpine mountain steppe community accord. to Zemmrich
(2007): Dissertation, Institute of Botany and Landscape
Ecology, University of Greifswald

Selection: ***Aconogonon alpinum***

If coordinates available:
You may want to see a **map**

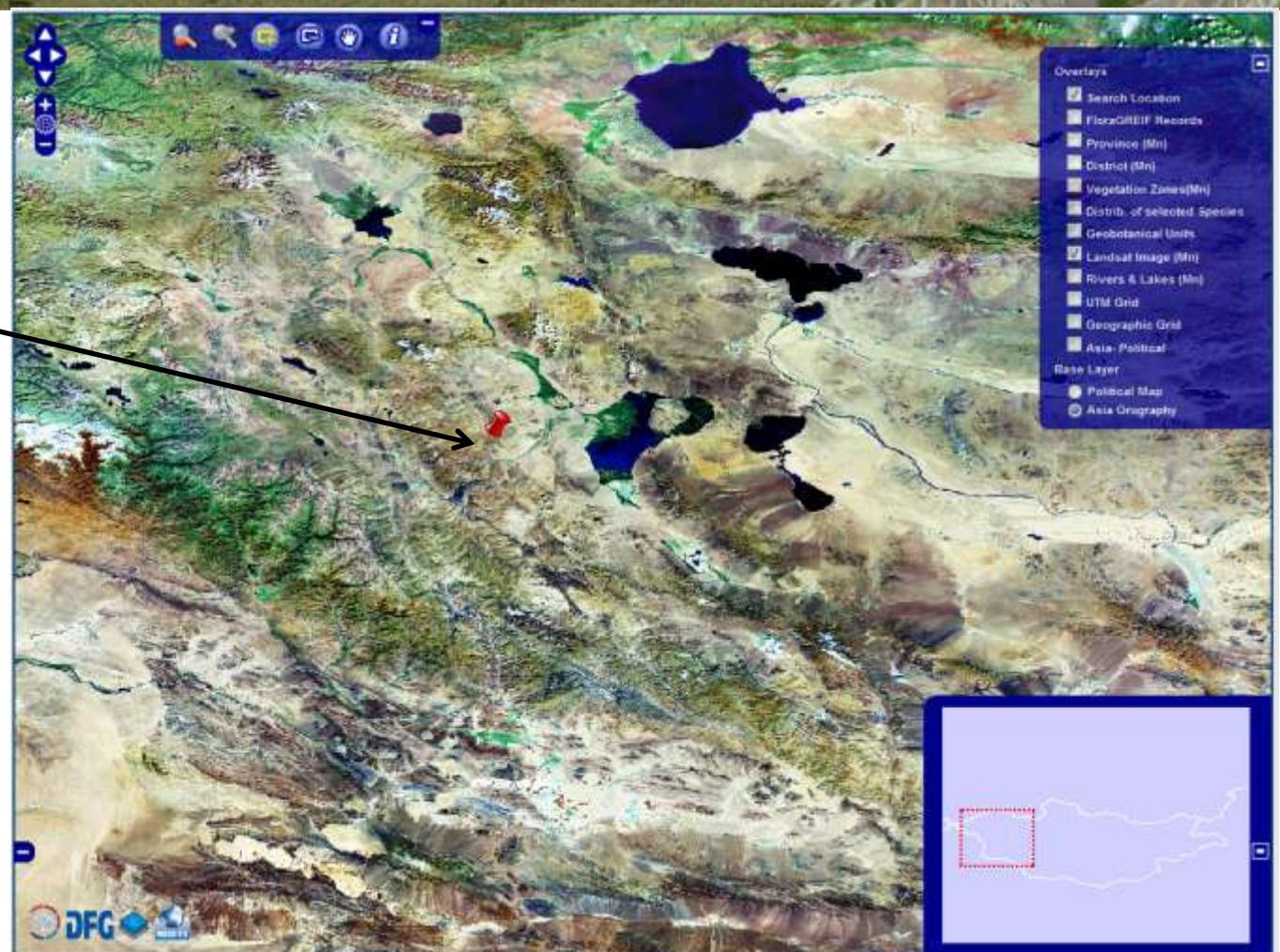


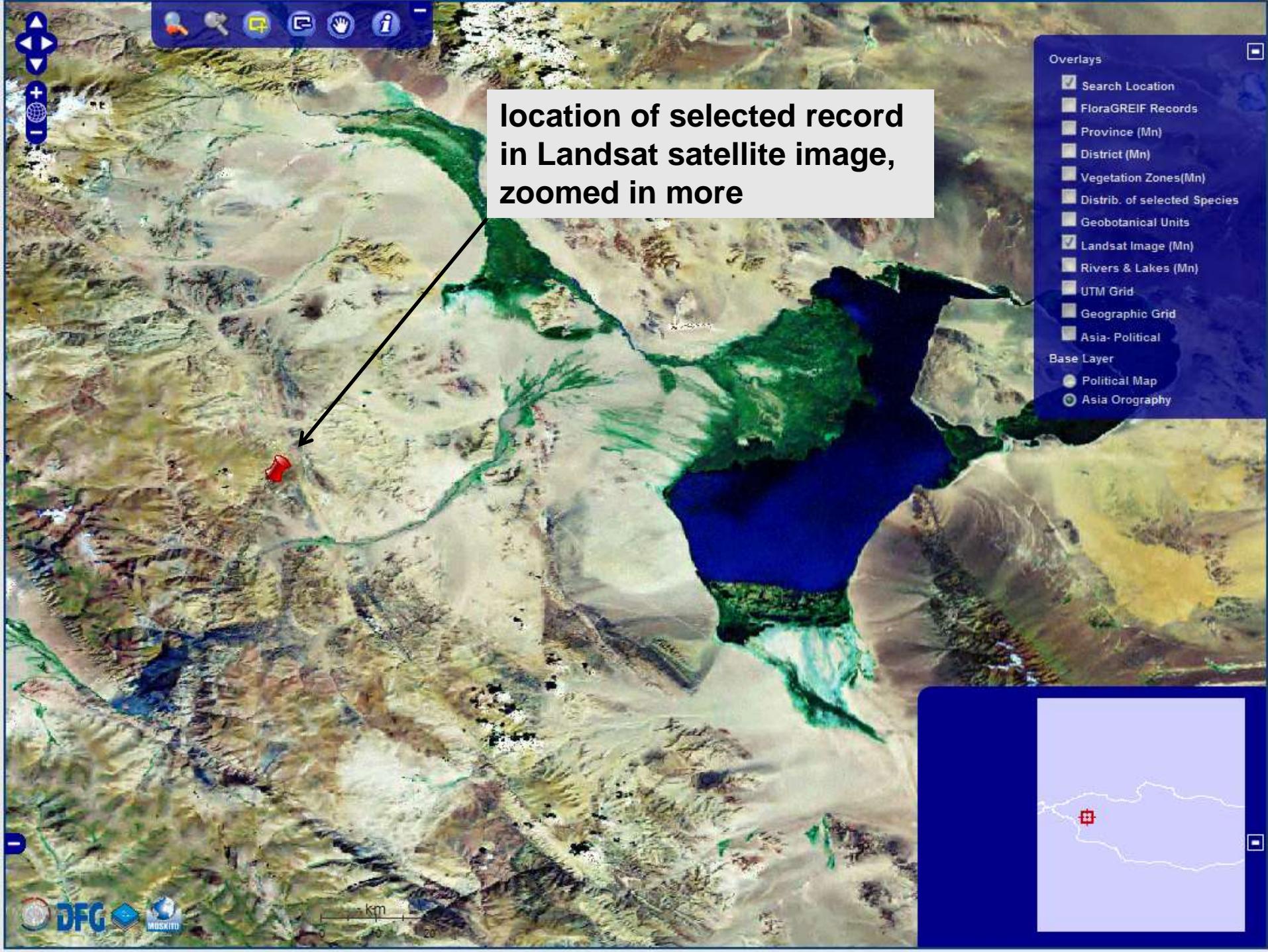
Display record location on map



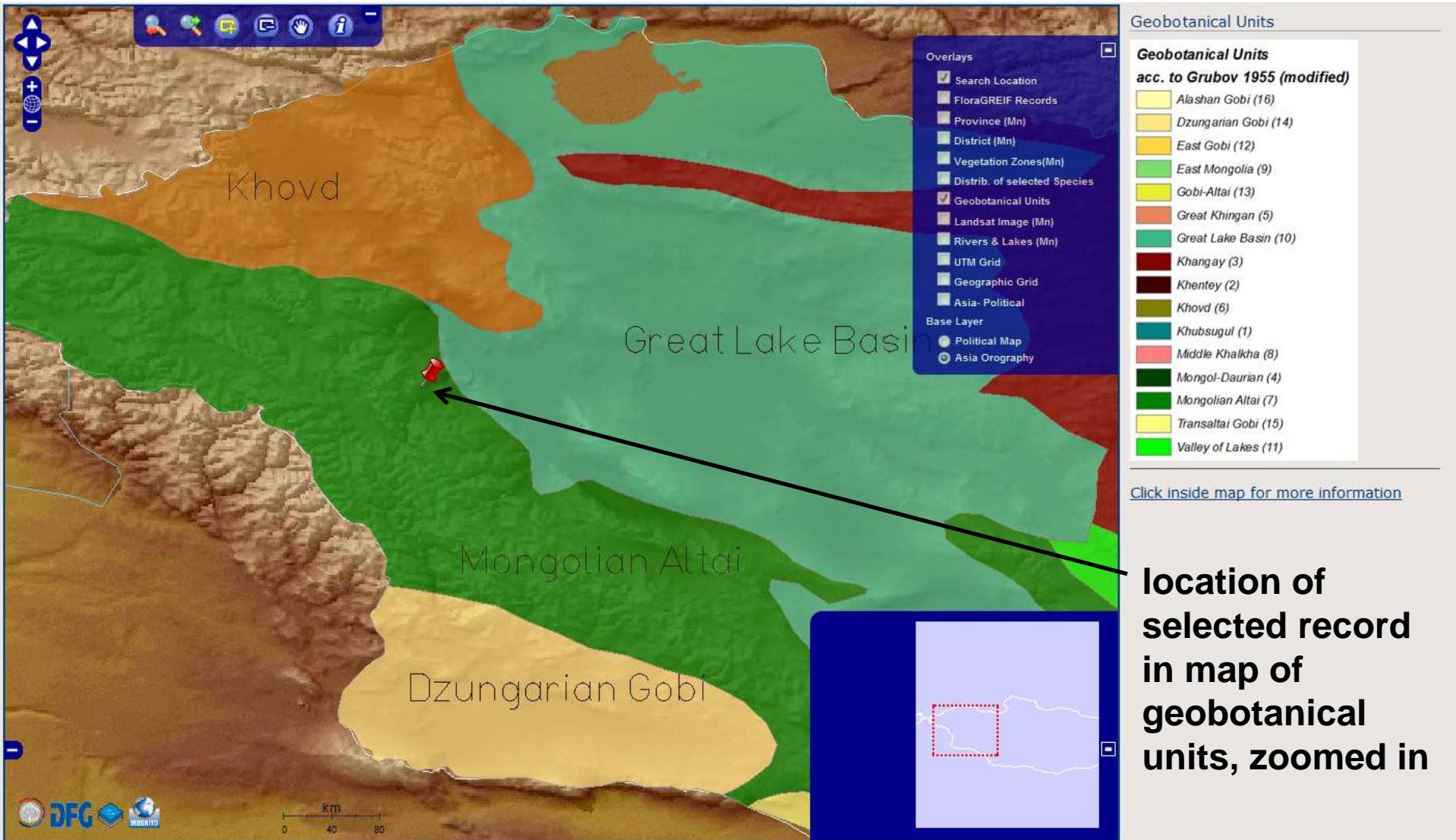
Satellite image

location of selected record in Landsat satellite image, zoomed in

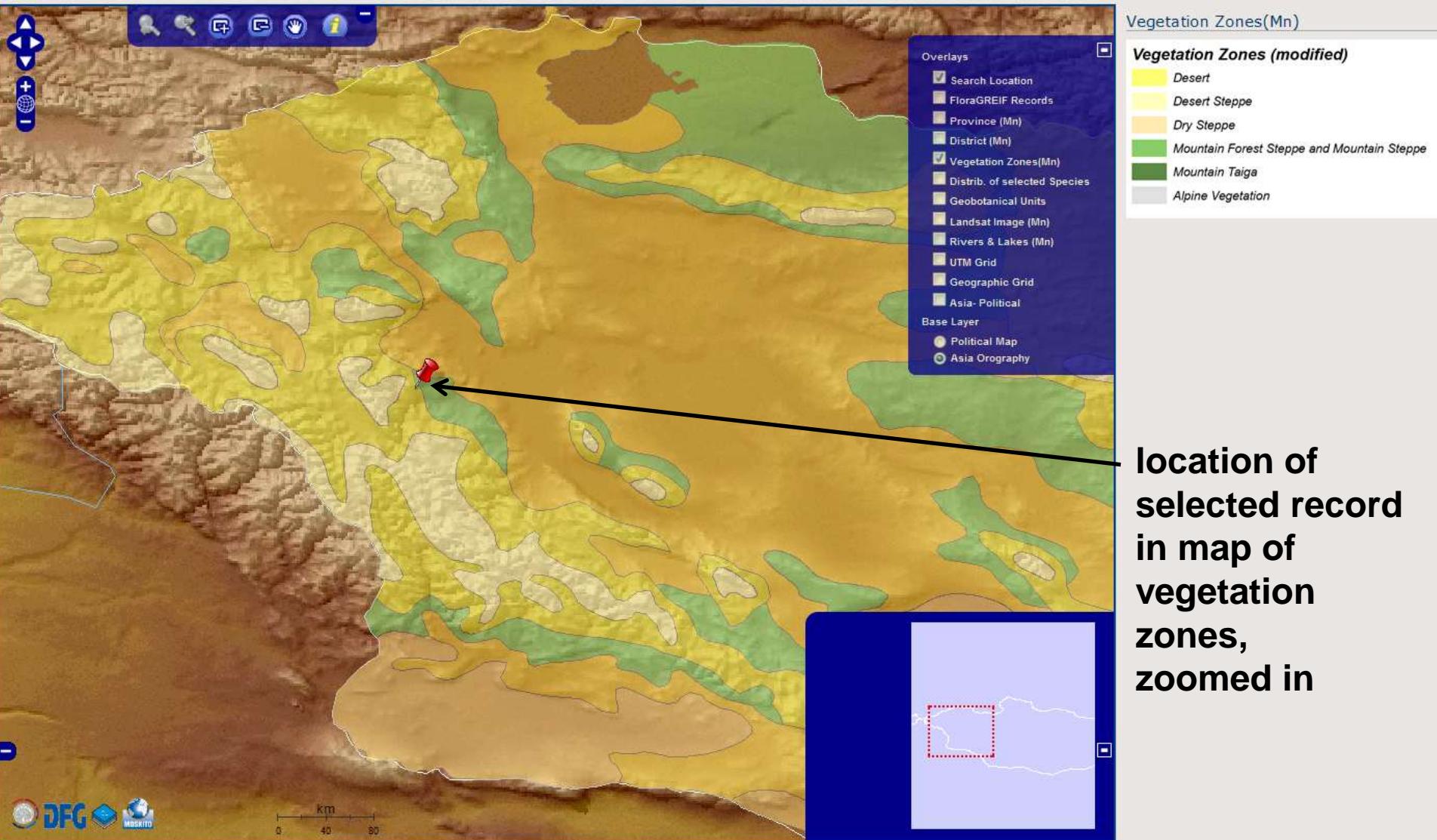




Geobotanical Units



Vegetation Zones



Coordinates and Feature Request

location of selected record in map of provinces, zoomed in

Die Seite mit der Adresse <http://www.geo.uni-greifswal...>

lon=91.325
lat=48.017
scale=2456861.846

OK

Unbekannt (1)

Name Khovd

Centre Dund-US

Province Khovd

Overlays

- Search Location
- FloraGREIF Records
- Province (Mn)
- District (Mn)
- Vegetation Zones(Mn)
- Distrib. of selected Species
- Geobotanical Units
- Landsat Image (Mn)
- Rivers & Lakes (Mn)
- UTM Grid
- Geographic Grid
- Asia-Political
- Base Layer

DFG

0 40 80 Km

Show coordinates of location where clicked, use it for data input when needed



Travel Logs

★ GIS-IDEAS Symposium FloraGREIF V 2.0

'Knapp'-Excursions

Excursions by Prof. Knapp

- Route 1978
- Route 1985
- Route by Helicopter 1985
- Route 1987
- Route by Helicopter 1987
- Route 1988

Vegetation Zones(Mn)

Vegetation Zones (modified)

- Desert
- Desert Steppe
- Dry Steppe
- Mountain Forest Steppe and Mountain Steppe
- Mountain Taiga
- Alpine Vegetation

Click inside map for more information

DFG MOSKU

km

40 80

104.944, 48.606 dd

Habitat Photos

FloraGREIF V 2.0 - Mozilla Firefox

Datei Bearbeiten Ansicht Chronik Lesezeichen Extras Hilfe

http://www.gis.uni-greifswald.de/openlayers/maps/floragreif_dev10.html

GIS-IDEAS Symposium FloraGREIF V 2.0 LEO Deutsch-Englisches Wörterbuch... MySQL – Wikipedia

Unbekannt (1)

Image

DFG MOSKITO

km

91.070, 49.088 dd

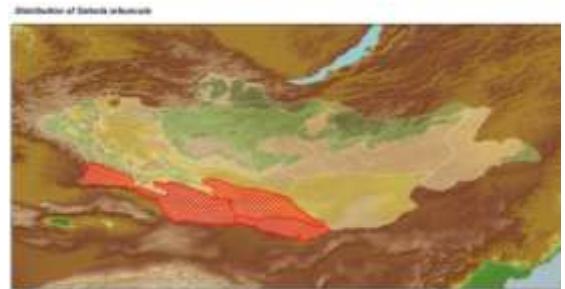
Fertig

Total Co... FloraGREIF... GISIDEAS... Floragreif... 10 Moskit... 3 Web-GL... 03:05

Near future, perspectives



- More partners
- More map layers
- More regions in central asia
- More point data layers (e.g. habitat photo)
- More records
- More photos
- Combining with other WMS's
- Built in Gazetteer- Service (toponyms for geographical regions)
- Advanced styling options



Cooperation

- Botanical Garden and Botanical Museum Berlin-Dahlem (Interface to GBIF Network – Global Biodiversity Information Facility)
- Herbaria of Berlin, Halle, Gatersleben and Jena
- University of Halle
- University of Hamburg
- Academy of Science of Mongolia
- State University of Khovd, Mongolia

A close-up photograph of a plant stem, likely a rose branch, showing several green, pointed, and fuzzy structures, possibly thorns or flower buds, against a dark background.

Thank you very much for your attention!

<http://floragreif.uni-greifswald.de>