USING DIGITAL RESOURCES TO PLAN FIELD EXPEDITIONS

Grant Godden
Postdoctoral Researcher
“If you don’t know where you’re going, any road’ll take you there.”
**General Workflow**

1. Cross-validation A: Comprehensive Checklist (with synonymy)
2. Data transformation: Georeferenced Data, Descriptive Locality Data
3. Cross-validation B
4. Data supplementation: Descriptive Locality Data
5. Georeferencing

**Digital Data Resources**
- Taxonomic Databases
- Specimen Data

**Digital Literature Resources**
- Floras
- Protologues

**Specimen Data**

**Georeferenced Data**

**Descriptive Locality Data**

**RANCHO SANTA ANA BOTANIC GARDEN**
INSTINTO DE CIENCIAS NATURALES

Resultados de la búsqueda (102)

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USE FORMULAS TO RECONFIGURE DATA FIELDS

W. R. Carr (with Debbie Benesh) 20190 (TEX); Date: 27-Sep-01; On S side of Independence Creek, ca. 1.4-1.6 airmiles E of St. Rt. 349 bridge, on Cannon Ranch portion of Oasis Ranch Preserve (TNC). Oasis Ranch Quadrangle. Elev. 2000-2040 ft.; Ecological Info: Rare on partially shaded limestone outcrops on lower portion of N to NNW-facing cliff and stepped slope.; Phenology: fruiting=late; County: Terrell.
Web Based Clients

The following based web clients are available to allow you to georeference data directly from your web browser:

- **Standard Client**
  Simply type in your locality description and get back georeferenced results. Start here if you are new to GEOLocate.

- **Batch (File Based) Client**
  Allows you to upload a .csv file and batch process it. (file formatting instructions)

- **Collaborative Georeferencing Client**
  Utilizes the collaborative georeferencing framework. Ideal for largescale multi-institution projects. (https link)

Note: if you use the secure SSL (HTTPS) link, please make sure your browser is configured to allow mixed mixed content, or you may see a blank map. Here are SSL configuration instructions for various browsers: in English and in Spanish (special thanks to David Draper for the Spanish translation).

**Embeddable client**
- A streamlined web client for the purpose of embedding in other web applications.
  - [Sample link](#) of how an external application on another domain might use this client.
  - [Documentation link](#) on how to craft URLs for this client.

Other Clients:
- Arctos
- Specify
- Symbiota
- Tropicos

Know of any other web based clients using GEOLocate? Let us know and we will be happy to list them.
GEO Locate Web Application

2 possible locations found:

- lat: -1.019722, lon: -71.938333, pattern: COMISARÍA DEL AMAZONAS, error polygon: Unavailable, uncertainty: Unavailable, precision: Low(52)
- lat: -1.019722, lon: -71.938333, pattern: AMAZONAS, error polygon: Unavailable, uncertainty: Unavailable, precision: Low(38)
SOME TIPS

❖ Beware of UTF-8 accents!
❖ Verify localities for rare taxa; supplement as needed
❖ Keep track of data provenance as a field!
❖ Pay attention to georeferencing notes (keep your own!)
❖ Look at your waypoints with satellite imagery
GENERAL WORKFLOW

1. Cross-validation A
   Comprehensive Checklist (with synonymy)

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4. Data supplementation
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Specimen Data

Rancho Santa Ana Botanic Garden
**General Workflow**

6. File Conversion
   - Comprehensive Georeferenced Localities
   - Prioritize Localities

7. Visualization
   - Google Earth (.kmz)
   - Base Camp (.gpx)

8. Prioritize Localities
   - Taxon x Area Matrix

9. Plan Tentative Route

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**Rancho Santa Ana Botanic Garden**
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<td><strong>Ruellia cuatrecasasii</strong> Wash.</td>
<td>J. Cuatrecasas &amp; L. Willard (MO). Date: 10/1/1961. Locality: Colombia;</td>
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<td><strong>Ruellia terminale (Nees) Wash.</strong></td>
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<td><strong>Ruellia ischopoda</strong> Leonard</td>
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<td><strong>Ruellia inundata Kunth</strong></td>
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<td><strong>Ruellia paniculata</strong></td>
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<td><strong>Ruellia tetrasanthantha Lindau</strong></td>
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<td><strong>Ruellia malacopserna sensu Small non Greenm.</strong></td>
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<td>A. Gomez et al. (MO) Date: 12-30-1992. Province: Antioquia. County/Municipality: Arboletes.</td>
<td><strong>8.88</strong> - <strong>76.5</strong></td>
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GPS Visualizer is an online utility that creates maps and profiles from geographic data. It is free and easy to use, yet powerful and extremely customizable. Input can be in the form of GPS data (tracks and waypoints), driving routes, street addresses, or simple coordinates. Use it to see where you've been, plan where you're going, or quickly visualize geographic data (scientific observations, events, business locations, customers, real estate, geotagged photos, etc.).

GPS Visualizer can read data files from many different sources, including but not limited to: GPX (a standard format used with many devices and programs, including Garmin's etrex, GPSMAP, Oregon, Dakota, Colorado, & Navi series), Google Earth (.kmz/km2), Google Maps routes (URLs), NMEA 0183 data, Microsoft Excel, Google Spreadsheets, XML feeds, Garmin Forerunner (.xml/hst/tcx), Timex Trainer, OziExplorer (.pdb/pts), TomTom (.ptg), IGN Rando (.rdn), Entac Trine, Suunto X9/X9i (.owf), Geocaching.com (.loc), FAI/IGC glider logs, Fugawi, Cetus GPS, PathAway, cotogPS, CompeGPS, NetStumbler, and of course tab-delimited or comma-separated text.

GPS Visualizer is based in Portland, Oregon, and has been on the Web since October 2002.
Convert your GPS data for use in Google Earth

This form will import your GPS data file (e.g., GPX), or plain-text data (tab-delimited or CSV), and create a KML file that you can view in the Google Earth application or import into Google’s “My Maps”/“My Places” system.

(You might also be interested in the Google Maps input form, which can create an interactive map that can be viewed in almost any Web browser; you can even use KML/KMZ files as input. For SVG or JPEG maps, use the “Classic” map form. To resize and/or colorize Google Earth markers based on a particular field, use the data form.)

If you want to add altitude information to your KML file, enable the option labeled “Add DEM elevation data.” GPS Visualizer’s server hosts a 90GB database of digital elevation data that can be integrated into your data.

Upload your GPS data files:
(Total size of all files cannot exceed 5 MB)
- File #1: Choose File, No file chosen
- File #2: Choose File, No file chosen
- File #3: Choose File, No file chosen

Show additional file input boxes

Or paste your data here:

name,desc,latitude,longitude

Force plain text to be this type: default

Or provide the URL of data on the Web:

Create KML file
Open in new window
VISUALIZING DATA
VISUALIZING DATA
6. File Conversion
- Comprehensive Georeferenced Localities
- 8. Prioritize Localities

7. Visualization
- Google Earth (.kmz)
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- Taxon x Area Matrix

9. Plan Tentative Route
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<td>REQUIRED TRAVEL FOR ENDEMIC TAXA</td>
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<td>HIGH SPECIES RICHNESS &amp; ENDEMIC TAXA</td>
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**Rancho Santa Ana Botanic Garden**
GENERAL WORKFLOW

10. Compilation of Digital Resources

Digital Reference Library

Comprehensive Checklist (with synonymy)

Published Literature

Floras

Protologues

Specimen Images

RANCHO SANTA ANA BOTANIC GARDEN

CONTRIBUTIONS FROM THE NATIONAL HERBARIUM

Corollas uniform in color.

Corollas pure white .................. 10a. R. tubiflora var. tubiflora
Corollas not white.

Endemic in Costa Rica; corollas yellow.

10b. R. tubiflora var. tetractchthys
Species of Panama and Colombia; corollas crimson, lilac, or red.

Corollas small, 4 cm. long or less.

Corollas pale violet .................. 10c. R. tubiflora var. purpurea
Corollas white .................. 10d. R. tubiflora var. purpurea f. alba

10e. R. rachis var. variegatum
Plants glossy, bearing a few hairs.

10f. R. ensifolius
Plants glossy, bearing a few hairs.

10g. R. elegans
Plants with leaf blades oblong to lanceolate, 6 cm. long and 3 cm. wide.

10h. R. elegans f. albiflora
Leaf blades obovate, narrowed at base.

10i. R. elegans f. albiflora var. leucophylla
Leaf blades obovate, narrowed at base.

10j. R. elegans f. albiflora var. gigantea
Leaf blades obovate, narrowed at base.

10k. R. elegans f. albiflora var. grandis
Leaf blades obovate, narrowed at base.

10l. R. elegans f. albiflora var. minor
Leaf blades obovate, narrowed at base.

10m. R. elegans f. albiflora var.最小
Leaf blades obovate, narrowed at base.

10n. R. elegans f. albiflora var. medium
Leaf blades obovate, narrowed at base.

10o. R. elegans f. albiflora var. major
Leaf blades obovate, narrowed at base.

10p. R. elegans f. albiflora var. maximum
Leaf blades obovate, narrowed at base.

10q. R. elegans f. albiflora var. minima
Leaf blades obovate, narrowed at base.

10r. R. elegans f. albiflora var. minima
Leaf blades obovate, narrowed at base.

10s. R. elegans f. albiflora var. minima
Leaf blades obovate, narrowed at base.

10t. R. elegans f. albiflora var. minima
Leaf blades obovate, narrowed at base.

10u. R. elegans f. albiflora var. minima
Leaf blades obovate, narrowed at base.

10v. R. elegans f. albiflora var. minima
Leaf blades obovate, narrowed at base.

10w. R. elegans f. albiflora var. minima
Leaf blades obovate, narrowed at base.

10x. R. elegans f. albiflora var. minima
Leaf blades obovate, narrowed at base.

10y. R. elegans f. albiflora var. minima
Leaf blades obovate, narrowed at base.

10z. R. elegans f. albiflora var. minima
Leaf blades obovate, narrowed at base.

10aa. R. elegans f. albiflora var. minima
Leaf blades obovate, narrowed at base.

10ab. R. elegans f. albiflora var. minima
Leaf blades obovate, narrowed at base.

10ac. R. elegans f. albiflora var. minima
Leaf blades obovate, narrowed at base.

10ad. R. elegans f. albiflora var. minima
Leaf blades obovate, narrowed at base.

10ae. R. elegans f. albiflora var. minima
Leaf blades obovate, narrowed at base.
Ruella cuatrecasasii Washausen, sp. nov.

Fig. 1 (D-G)

Type: J. Cuatrecasas & L. Willard 26123, Colombia, Antioquia: Between Villa Arteaga and Chigorodó, El Tigre, ± 100 m, 1 Oct. 1961 (US holotype).

Suffrutescent, 1 mm tall; stem ascending, sub-quadrangular, grooved and rounded on the angles, pilose, the trichomes 1-1.5 mm long, upwardly curved or appressed. Leaves long-petiolate, the petioles 3.5-4 cm long, glabrous or sparingly pilose, the blades oblong-elliptic, 24-27 cm long, 10.5-11.5 cm broad, short-acuminate at apex, narrowed at base, entire, the upper surface dark-green, glabrous or bearing a few scattered appressed trichomes less than 0.5 mm long, the lower surface a lighter green, minutely and obscurely puberulous, especially along the costa and lateral veins (10 to 11 pairs), these more prominent on the lower surface. Flowers borne in pairs or several, peduncled, clustered in the axis of the upper leaves, the peduncles 2.3-3 cm long, sharply quadrangular, densely pilose, the trichomes 1-1.5 mm long, upwardly appressed; pedicels quadrangular, 2.5 mm long; bracts subtending the flower oblongellate, 3.5-4 cm long and 3.5-4 mm broad, acute at apex, narrowed at base, both surfaces sparingly pilose, the trichomes upwardly appressed; calyx about 2 cm long, the segments lance-subulate, densely pilose, subequal, the posterior lobe 2.5 mm broad, the anterior pair 2 mm broad, the lateral pair 1.75 mm broad; corolla white, 6.5 cm long, moderately pilose without, especially along the throat, the tube infundibular, curved, 3 mm
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Summary

- One of many ways to use biodiversity data
- Plans based on existing data resources can save time and money!
- Workflow facilitates use of portable/handheld devices to:
  - Find localities with handheld devices
  - Identify local land features
  - Review previous collector observation data
  - Program your search image
  - ID specimens in the field
For more information on:

Useful links:
- Biodiversity Heritage Library: http://www.biodiversitylibrary.org/
- GeoLocate: http://www.museum.tulane.edu/geolocate/
- GPS Visualizer: http://www.gpsvisualizer.com/
- J-Stor Global Plants: http://plants.jstor.org/
- Taxonomic Name Resolution Service: http://tnrs.iplantcollaborative.org/
- Tropicos: http://tropicos.org