

## Guide to the BIEN2 Database

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#### 1. How to connect:

server:            bien.nceas.ucsb.edu  
username:        bien\_read  
password:        T0d0B!en [note zeros, not 'ohs']  
database:        bien2

Using phpMyAdmin?

- Enter the following address in browser address bar:  
<http://bien.nceas.ucsb.edu/phpmyadmin/index.php>
- Enter username and password

Need shell access to bien server? Ask Brad.

#### 2. Principal tables

##### viewFullOccurrence

- Principal summary table of entire database
- Includes each unique Plot x Taxon x Time occurrence (one record per taxon per plot per census)
- Summarizes abundance within different size classes, and/or percent cover, depending on plot type
- Each specimen also has its own line

Fields:

OccurID INTEGER(11) NOT NULL – artificial integer identifier of each record  
(primary key)

APGFamily VARCHAR(64) NOT NULL – Family according to APG III

CTFSFamily VARCHAR(64) NOT NULL – Family used in CTFS database

KewFamily VARCHAR(64) NOT NULL – Family according to Kew

TaxonomyID INTEGER(11) NOT NULL – link to identifier of original name in table  
TaxonDimension

TaxonCorrectedID INTEGER(11) NOT NULL – link to identifier of corrected name in table TaxonDimension  
 OrigGenus VARCHAR(64) NOT NULL – original genus  
 OrigSpecies VARCHAR(64) NOT NULL – original specific epithet  
 Genus VARCHAR(64) NOT NULL - correct genus  
 Species VARCHAR(64) NOT NULL – corrected specific epithet  
 Morphospecies VARCHAR(255) NOT NULL – morphospecies string, if any  
 TaxonMorphoSpecies VARCHAR(255) NOT NULL – concatenated full taxon name + morphospecies string  
 Country VARCHAR(32) NOT NULL  
 Province VARCHAR(64) NOT NULL  
 County VARCHAR(64) NOT NULL  
 Plot VARCHAR(32) NOT NULL – Name or code of this plot (NULL if a specimen)  
 DBPlotID INTEGER(11) NOT NULL – link to identifier of this plot in table PlotMetaDataDimension  
 PlotArea VARCHAR(10) NOT NULL  
 Latitude DECIMAL(105) NOT NULL  
 Longitude DECIMAL(105) NOT NULL  
 Date DATE NOT NULL – Date of collection or census  
 SurveyType VARCHAR(10) NOT NULL – 'Plot' or 'Specimen'  
 Abund INTEGER(11) NOT NULL – total individuals of this species in plot  
 Abund1 INTEGER(11) NOT NULL – total individuals  $\geq$  1 cm dbh in plot  
 Abund2.5 INTEGER(11) NOT NULL – total individuals  $\geq$  2.5 cm dbh in plot  
 Abund10 INTEGER(11) NOT NULL – total individuals  $\geq$  10 cm dbh in plot  
 PctCover DECIMAL(105) NOT NULL – percent cover of this species within plot  
 DataSource VARCHAR(128) NOT NULL – Short text name of data provider/owner

### **traitObservation**

- Trait observations or measurements for species
- May or may not have accompanying information on locality, date, etc
- Caveat:
  - Not yet scrubbed taxonomically (will be in 2-3 more days) or geographically. Coming up!
- Principal fields:
  - TraitName: e.g., Flowering Time, Leaf K, seed mass
  - TraitValue
  - Unit
- Values of 'TraitName' current in database:
  - Area-based photosynthesis (Aarea)
  - d13C
  - Flowering date
  - Flowering day
  - Flowering month
  - Germination time
  - Height
  - Leaf area
  - Leaf Cmass

Leaf dry area  
Leaf dry matter content (LDMC)  
Leaf K  
Leaf lifespan (LLS)  
Leaf Narea  
Leaf Nmass  
Leaf Parea  
Leaf Pmass  
Leaf thickness  
Mass-based photosynthesis (Amass)  
PNUe  
seed mass  
Specific leaf area (SLA)  
Stomatal conductance (Gs)  
wood density

Fields:

TraitObservationID INTEGER(11) UNSIGNED NOT NULL  
TaxonomyID INTEGER(11) UNSIGNED NOT NULL – Link to original name in table  
TaxonDimension  
Family\_verbatim VARCHAR(100) NOT NULL – original (verbatim) value  
Genus\_verbatim VARCHAR(100) NOT NULL – original (verbatim) value  
SpecificEpithet\_verbatim VARCHAR(100) NOT NULL – original (verbatim) value  
InfraspecificRank\_verbatim VARCHAR(25) NOT NULL – original (verbatim) value  
InfraspecificEpithet\_verbatim VARCHAR(100) NOT NULL – original (verbatim)  
value  
Taxon\_verbatim VARCHAR(255) NOT NULL – concatenated form of original  
(verbatim) taxon name, without authority  
AuthorOfScientificName\_verbatim VARCHAR(255) NOT NULL – original (verbatim)  
Authority  
taxonAuthor\_verbatim varchar(100) DEFAULT NULL – concatenated form of original  
(verbatim) taxon name with authority  
family\_corrected varchar(100) DEFAULT NULL  
species\_corrected varchar(100) DEFAULT NULL,  
taxon\_corrected varchar(100) DEFAULT NULL  
author\_corrected varchar(100) DEFAULT NULL  
taxonAuthor\_corrected varchar(100) DEFAULT NULL  
Habit VARCHAR(50) NOT NULL – growth form of this species; will eventually be  
eliminated as separate field and included in TraitName/TraitValue  
TraitName VARCHAR(200) NOT NULL – Name of trait (controlled vocabulary; see  
list below)  
TraitValue VARCHAR(100) NOT NULL – Value of this trait for this observation  
Unit VARCHAR(100) NOT NULL – Units used if this is a measurement  
Method VARCHAR(255) NOT NULL  
Region VARCHAR(100) NOT NULL  
Country VARCHAR(100) NOT NULL  
StateProvince VARCHAR(100) NOT NULL  
LowerPolitical VARCHAR(100) NOT NULL

LocalityDescription VARCHAR(100) NOT NULL  
VerbatimLatitude VARCHAR(150) NOT NULL  
VerbatimLongitude VARCHAR(150) NOT NULL  
VerbatimElevation VARCHAR(150) NOT NULL  
Source VARCHAR(100) NOT NULL  
URLSource VARCHAR(100) NOT NULL  
SourceCitation VARCHAR(1000) NOT NULL  
SourceID VARCHAR(255) NOT NULL  
VisitingDate VARCHAR(100) NOT NULL  
ReferenceID INTEGER(11) UNSIGNED NOT NULL  
Access VARCHAR(100) NOT NULL  
Project\_PI VARCHAR(255) NOT NULL  
Project\_PI\_contact VARCHAR(100) NOT NULL  
Observation VARCHAR(255) NOT NULL  
Authorship VARCHAR(255) NOT NULL  
AuthorshipContact VARCHAR(100) NOT NULL

### **TaxonDimension**

- Fundamental unit: each unique taxon name string in database.
- This table has a lot of fields you don't need to know about. Below are the ones that matter

### Fields

TaxonomyID INTEGER(11) NOT NULL – artificial integer unique identifier  
FamilyName VARCHAR(64) NOT NULL  
GenusName VARCHAR(64) NOT NULL  
SpecificEpithet VARCHAR(64) NOT NULL  
InfraspecificEpithet VARCHAR(64) NOT NULL  
InfraspecificRank VARCHAR(64) NOT NULL  
Authority VARCHAR(128) NOT NULL  
taxonAuthorityVerbatim VARCHAR(250) NOT NULL – concatenated form of original (verbatim) taxon name with authority  
taxonMatched VARCHAR(250) NOT NULL – standard taxon name (minus author) matched by TNRS  
taxonMatchedAuthority VARCHAR(250) NOT NULL – standard taxon name (plus author) matched by TNRS  
matchScore DECIMAL(32) NOT NULL – TNRS score for matched name (1.00=perfect match)  
acceptance VARCHAR(250) NOT NULL – taxonomic opinion on taxonMatched; A=accepted, S=synonym, NULL=no opinion  
taxonCorrected VARCHAR(250) NOT NULL – correct taxon name; if acceptance=A or acceptance is NULL, this will be same as taxonMatched; if acceptance=S, this will be the accepted name  
authorityCorrected VARCHAR(250) NOT NULL – canonical spelling of authority associated with taxonCorrected  
morphospecies VARCHAR(250) NOT NULL – morphospecies string, if any

taxonMorphospecies VARCHAR(250) NOT NULL – fully concatenated standard part of name (taxonCorrected) plus morphospecies string

### 3. Example queries

- a. All georeferenced occurrences of species from specimens, include political division information. Fully determined species only.

```
SELECT Genus, Species, Country, Province, County, Latitude, Longitude
FROM viewFullOccurrence
WHERE Latitude IS NOT NULL AND Longitude IS NOT NULL AND
SurveyType='Specimen' AND Species IS NOT NULL
```

- b. Abundances of individuals  $\geq 2.5$  cm dbh of all taxa in all plots from Bolivia, including morphospecies & family. Use family according to APGIII.

```
SELECT Plot, TaxonMorphoSpecies, `Abund2.5`
FROM viewFullOccurrence
WHERE Country='Bolivia' AND `Abund2.5` IS NOT NULL AND
TaxonMorphoSpecies IS NOT NULL
```

- c. Mean abundance by species of trees  $\geq 10$  cm dbh of all taxa in all plots from Bolivia, including morphospecies.

```
SELECT TaxonMorphoSpecies, Plot, AVG(Abund10)
FROM viewFullOccurrence
WHERE Country='Bolivia' AND Abund10 IS NOT NULL AND TaxonMorphoSpecies
IS NOT NULL
GROUP BY APGFamily, TaxonMorphoSpecies, Plot
```

- d. Count total species per plot for all 0.1 ha plots which use a 2.5 cm dab size cutoff:

```
SELECT v.Plot, COUNT(v.TaxonMorphoSpecies)
FROM viewFullOccurrence v INNER JOIN PlotMetaDataDimension p
ON v.DBPlotID=p.DBPlotID
WHERE p.PlotCensusMethod LIKE "%0.1 ha%" AND p.PlotCensusMethod LIKE
"% $\geq 2.5$ %" AND v.TaxonMorphoSpecies IS NOT NULL
GROUP BY Plot
```

Note that this requires a join to table PlotMetaDataDimension (contains metadata for each plot) to extract additional information concerning methodology used.