Guidelines for recording Locality Data in the Field for the MCZ

Complete locality data should accompany all collected materials. The following locality guidelines promote data quality and fitness, and describe required information from collectors submitting specimens:

LOCALITIES

Localities should consist of a combination of geographic coordinates and descriptive text. Although coordinates may accurately express the position of a collecting site, a written description allows for the validation of these points, in which errors are otherwise difficult to detect. Descriptions should be detailed, the more the better. Make your assumptions explicit to avoid ambiguity. Good specific localities typically include a distance along a path from a well-defined landmark (i.e., bridge, intersection), or by two orthogonal distances from a named place/feature, and avoid vague terminology such as "near." Reference points should be stable in position over time, small in extent, and easy to locate on a map. If it's 2.5 miles N or Smithfield on route X, be more explicit about whether the 2.5 miles is from the center of Smithfield, the post office (provide address), or the boundary of Smithfield on Route X, and whether the 2.5 miles are road miles from an odometer or as the crow flies with a GNSS/GPS* pointer or a map. [More examples provided on last page]

COORDINATES

Coordinates should be recorded in decimal degrees when possible, and include all decimals of precision. When coordinates have been converted to decimal degrees from a different system (i.e., degrees minutes seconds), provide the original data points for posterity.

DATUM

The datum is an essential part of a coordinate description, and provides the frame of reference for the measured points. Reporting the wrong datum or none at all can result in positional errors of hundreds of meters. If you are using a GNSS/GPS receiver, set the geodetic datum to WGS84. If you are obtaining coordinates from a map, record the geodetic datum used by that map and the coordinates in the coordinate system as read off the map.

GNSS/GPS ACCURACY*

Record GNSS/GPS accuracy with coordinates. Accuracy is calculated based on local conditions at the time of reading, and can make a non-trivial contribution to the overall uncertainty of a locality. Some GNSS/GPS receivers can conduct waypoint averaging to obtain a more accurate location for a waypoint. For the GNSS/GPS receiver, also record whether WAAS is turned on or not.

You can use a GNSS/GPS receiver to convert a local coordinate system and datum from a map to Latitude/Longitude with WGS84 (EPSG: 4326). If doing so, make sure you record the original coordinates, their coordinate system, and the geodetic datum used by the map.

EXTENT

Specify the spatial extent of the locality, measured as the distance from the point where coordinates are read to the furthest point within the named place boundary where collecting occurred (length of transect/quadrat, city block, tide pool, *etc.*). Gazetteers often give bounding boxes to describe the extents of large places such as cities and counties. Extent measurements convey how specific a named locality is (0.5 miles vs. 0.5 feet) and binds uncertainty by eliminating areas outside of the stated extent.

ELEVATIONS

Elevations reported by a GNSS/GPS receiver are much less reliable than horizontal positions (latitude/longitude). If elevation is a defining piece of a locality description, use an instrument such as a calibrated barometric altimeter for accurate measurements. Record the vertical datum used as well as the method used to determine the elevation. Vertical datums are either: tidal, based on sea levels; gravimetric, based on a geoid; or geodetic, based on the same ellipsoid models of the Earth used for computing horizontal datums. A GNSS/GPS receiver may not report what vertical datum it is using. Maps will indicate their vertical datum (e.g., meters above mean sea level) as well as their geodetic horizontal datum (e.g., NAD27).

REFERENCES

Fully document any references or tools used to describe localities as follows:

- Gazetteers or Road Atlases: record complete citation
- Maps: Title, Publisher, Scale, Year, Sheet Number
- GPS device or Altimeter: record make and model

Remember that data have the potential to be used in ways unforeseen than when originally collected, and capturing complete data is essential to both current and future research endeavors.

* GPS is just one of several GNSS systems, and that modern GPS receivers tend to be GNSS receivers listening to more than one satellite constellation.

LOCALITY DESCRIPTION EXAMPLES OF COMMON PROBLEMS & TIPS TO CORRECT:

Localities that give a large area without more specific detail:

- **BAD:** 4 mi N of Tyngsborough/Nashua border [Why: Could mean anywhere 4 miles north along the common border]
- **GOOD:** 4 mi N of Tyngsborough/Nashua border on Route 3, Hillsborough County, New Hampshire
- **BAD:** Pond along Chatahoochee River, Fulton Co., Georgia [Why: Which pond?]
- **GOOD:** Pond, 0.43 mi SW of intersection of Nancy and Ridgewood Roads, Chattahoochee River National Recreation Area, Fulton Co., Georgia

Names of Roads without additional points of reference:

- **BAD:** Highway 9, Alajuela Province, Costa Rica [Why: Could be anywhere along the highway]
- **GOOD:** Intersection of Hwy 9 and Rio Cariblanco, Cariblanco (town), Alajuela Province, Costa Rica

Directions given with no distances, road or air miles noted:

- **BAD:** S Berkeley, Alameda County, California [Why: Could be anywhere south of Berkeley]
- **GOOD:** Oakland, 1 mi S Berkeley on Telegraph Ave. (1 mi S of intersection of 66th St and Telegraph Ave), Alameda Co., California

Multiple cities described by the same name within the same administrative unit:

- **BAD:** San Marcos, Intibuca Province, Honduras [Why: There are at least five San Marcos in Intibuca Province]
- **GOOD:** San Marcos, ca 7.5 km south of Los Chaguites, Intibuca Province, Honduras

Cities and geographic features that share the same name [in this case, note which locality is intended]:

- **BAD:** Battle Mountain, Lander Co., Nevada [Why: Unclear if reference is the city or mountain]
- **GOOD:** Battle Mountain (city), Lander Co., Nevada

Highway mi/km markers are difficult to georeference retrospectively without additional information:

- **BAD:** Km 58 Pan American Highway [Why: Markers are not permanent, may be moved over time]
- **GOOD:** Km 58 Pan American Highway, 6 km S of Cartago on Pan American Highway, Cartago Province, Costa Rica

Keep in Mind:

- Be aware when crossing county/state/country lines while collecting. Be sure to record the correct names and specify clearly if using a town in a different county/state as an offset (e.g., 10 mi below Ehrenberg [La Paz Co, Arizona] on the Colorado River, Imperial Co., California).
- Correctly spell foreign localities (include all diacritic marks) – misspellings in familiar place names are easily corrected, but may cause confusion in other languages (e.g. Turrubares vs. Turrucares, Barra Blanca vs. Vara Blanca).
- Descriptive localities lacking coordinate data recorded as a city name are georeferenced as the centroid of the city. Note instead if the specimen is collected on the outskirts of the city, and provide as much specific detail as possible (such as an exact intersection or feature, e.g., Ann Arbor, 0.5 mi. N of Dolph Lake).