

MVZ Guide for Recording Localities in Field Notes

Complete locality data, including the information outlined below, should accompany all collected material and observations.

Locality: Provide a descriptive locality, even if you have geographic coordinates. Write the description from specific to general, including a specific locality, offset(s) from a reference point, and administrative units such as county, state, and country. The locality should be as specific, succinct, unambiguous, complete, and accurate as possible, leaving no room for uncertainty in interpretation. **Hint:** The most specific localities are those described by a) a distance and heading along a path from a nearby and well-defined intersection, or b) two cardinal offset distances from a single nearby feature of small extent.

Elevation: Supplement the locality description with elevation information. **Hint:** A barometric altimeter, when properly calibrated, is much more reliable than a GPS for obtaining accurate elevations.

Coordinates: Whenever practical, provide the coordinates of the location where collecting actually occurred (see Extent, below). If reading coordinates from a map, use the same coordinate system as the map. **Hint:** The decimal degrees coordinate system is preferred when reading coordinates from a GPS.

Datum: The datum is an essential part of a coordinate description; it provides the frame of reference. When using both maps and GPS in the field, set the GPS datum to be the same as the map datum so that your GPS coordinates will match those on the map. **Hint:** Always record the datum with the coordinates.

GPS Accuracy: Record the accuracy as reported by the GPS whenever you take coordinates. **Hint:** Most GPS devices do not record accuracy with the waypoint data, but provide it in the interface showing current satellite conditions.

Extent: The extent is a measure of the size of the area within which collecting or observations occurred for a given locality – the distance from the point described by the locality and coordinates to the furthest point where collecting or observations occurred in that locality. **Hint:** A 1 km linear trap line for which the coordinates refer to the center has an extent of 0.5 km.

References: Record the sources of all measurements. Minimally, include map name, GPS model, and the source for elevation data.

Example:

Modoc National Wildlife Refuge, 2.8 mi S and 1.2 mi E junction of Hwy. 299 and Hwy. 395 in Alturas, Modoc Co., Calif.

Lat/Long/Datum: 41.45063 N, 120.50763 W (WGS84)

Elevation: 1330 ft

GPS Accuracy: 24 ft

Extent: 150 ft

References: Garmin Etrex Summit GPS for coordinates and accuracy, barometric altimeter for elevation.

Reasons Why It's Important to Take Good Locality Data:

Data Quality

"Data are of high quality if they are fit for their intended use" (Juran 1964). As a collector, you may have an intended use for the data you collect. In the museum, the data you collect have the potential to be used in unforeseen ways; therefore, the value of your data is directly related to the fitness of those data for variety of uses. Higher quality locality data can be achieved by following the guidelines given in the "MVZ Guide for Recording Localities in Field Notes", the justifications for which are elaborated below.

Locality: One purpose behind a specific locality description is to allow the validation of coordinates, in which errors are otherwise difficult to detect. The extent to which validation can occur depends on how well the locality description and its spatial counterpart describe the same place. The highest quality locality description is one with as few sources of uncertainty as possible. By describing a place in terms of a distance along a path, or by two orthogonal distances from a place, one removes uncertainty due to imprecise headings. By choosing a reference point of small extent, one reduces the uncertainty due to the size of the reference point. By choosing a nearby reference point, one reduces the potential for error in the offset distances. To make it easy to validate a locality, try to use reference points that are easy to find on maps or in gazetteers. At all costs, avoid using vague terms such as "near" and "center of". In any locality that contains a named place that can be confused with another named place of a different type, specify the feature type in parentheses following the feature name.

Locality example using distance and heading along a path:
E shore Bolinas Lagoon, 3.1 mi NW (via Hwy. 1) intersection of Hwy. 1 and Calle del Arroyo in Stinson Beach (town), Marin Co., Calif.

Locality example using two cardinal offset distances from a reference point:
ice field below Cerro El Plomo, 0.5 km S and 0.2 km W of summit, Region Metropolitana, Chile

Elevation: Under normal conditions, GPS devices are much less accurate for elevation than for horizontal distances, and they do not report the altitudinal accuracy. If elevation is a defining part of the locality description, be sure to use a reliable source for this measurement (barometric altimeter, or a trustworthy map), and specify the source under references.

Coordinates: Coordinates are a convenient way to define a locality that is not only more specific than is otherwise possible with a description, but that is also readily usable in GIS applications. Always include as many decimals of precision as given by the coordinate source. A measurement in decimal degrees given to five decimal places is more precise than a measurement in degrees minutes seconds, and more precise than a measurement in degrees decimal minutes

given to three decimal places. Set your GPS to report locations in decimal degrees rather than make a conversion from another coordinate system.

Datum: Except under special circumstances (the poles, for example), coordinates without a datum do not uniquely specify a location. Confusion about the datum can result in positional errors of hundreds of meters. If you are not basing your locality description on a map, set your GPS to report coordinates using the WGS84 datum.

GPS accuracy: Most GPS devices are able to report a theoretical horizontal accuracy based on local conditions at the time of reading. For highly specific localities, it may be possible for the potential error in the GPS reading to be on the same order of magnitude as the extent of the locality. In these cases, the GPS accuracy can make a non-trivial contribution to the overall uncertainty in the position given by the coordinates. By habitually recording the GPS accuracy, you will not have to worry about whether this is the case, and your data will be of the highest possible quality.

Extent: Collecting and observations often take place in an area described collectively by a single locality (e.g., within 1 km of the place described in the recorded locality). Without a measure of the potential deviation from the point provided, a user of the data usually has no way to know how specific the locality actually is. The extent is a simple way to alert the user that, for example, all of the specimens I say I collected at the coordinates I recorded were actually up to 0.5 miles from that point. It can be quite helpful at times to include in your field notes a large-scale map of the local vicinity for each locality, marking the area in which the collecting and observations occurred.

Examples of Good and Bad Localities

Vague Localities

These are localities that give a large area without more specific detail.

BAD: Sacramento River Delta - an extremely large geographic area

BETTER: Locke, Sacramento River Delta, Sacramento Co., California - names a town within the Delta

BAD: 3 mi W of San Jose/Cartago border - without additional details, this would mean anywhere 3 mi W of the border

GOOD: 3 mi W of San Jose/Cartago border on Highway 2, San Jose Province, Costa Rica

BAD: Pond along Chattahoochee River, Fulton Co., Georgia - there are millions of ponds along the Chattahoochee River

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

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

GOOD: Oakland, 1 mi S Berkeley on Telegraph Ave. (1 mi S of intersection of 66th St and Telegraph Ave), Alameda Co., California

Localities that are difficult to Georeference

For many countries, especially Spanish-speaking ones, there are oftentimes several cities with the same name in the same province.

BAD: San Marcos, Intibuca Province, Honduras - There are at least five San Marcos in Intibuca Province

BETTER: San Marcos, ca 7.5 km south of Los Chaguites, Intibuca Province, Honduras

If there is both a city and a geographic feature that share the same name, then note which locality (city, mountain, creek, lake) you meant.

BAD: Battle Mountain, Lander Co., Nevada

BETTER: Battle Mountain (city), Lander Co., Nevada

Highway mi/km markers are very difficult to georeference retrospectively unless additional information is given.

BAD: Km 58 Pan American Highway

GOOD: Km 58 Pan American Highway, 6 km S of Cartago on Pan American Highway, Cartago Province, Costa Rica

Things to watch out for

- Crossing County/State/Country lines while collecting - make sure to use the correct names and specify clearly if using a town in a different county/state for an offset, e.g., 10 mi below Ehrenberg (La Paz Co, Arizona) on the Colorado River, Imperial Co, California
- Spelling of Foreign Localities - while a misplaced letter in a familiar name is easily corrected, for example "Berkely" instead of "Berkeley," a misspelling in any other language can cause confusion.
e.g. Turrubares instead of Turrucars, Barra Blanca instead of Vara Blanca
- Due to the nature of the georeferencing guidelines, localities that are simply given as a city name are georeferenced as the center of the city. If the specimen is collected on the outskirts of the city, then it must be noted as such. Specifying an exact intersection is best.

Juran, J.M. 1964. Managerial Breakthrough. New York. McGraw-Hill.