



**Oregon Geographic Information Council (OGIC)
GIS Program Leaders
Cartographic Elements Best Practices
Version 1.0.7**

Introduction

The purpose of this document is to serve as a set of Oregon best practices for the inclusion of cartographic elements on maps. Cartographic elements include map parameters and reference information. Because cartographic products are quite varied in content, use, and medium it is not possible to establish required elements for maps produced in Oregon, the intent is that this document should serve as best practices guidelines for organizations producing maps in the state of Oregon. These best practices could serve as a basis for an organization to select elements that will be required for maps produced by that organization. This document does not replace existing organizational mapping protocols.

In its simplest form, a map is a visual display representing geospatial information. Often a map will become a legal document or will be used as an authoritative reference for many years. Therefore, it is important to treat each map as a standalone document for use by an individual not familiar with the context of the map. Once a map is distributed the author cannot control how or when that map is used. Use of these cartographic elements will increase long term reference value and reduce inappropriate use.

Map publication can be accomplished in several formats: hard copy, on-line dynamic maps, and various digital formats. A web display of geospatial data is temporary; however, if the user of a web map prints from that application, these best practices should be considered. Inset maps or cartographic illustrations within a larger publication may not need all of the elements listed in this document.

There are several aspects to creating a quality map product that are not addressed here. Individuals producing maps should apply principles such as: appropriate projection, readability, clarity of communication, visual hierarchy, map element generalization, element conflicts, color compatibility, and disability accessibility such as colorblindness. There are numerous published references that address these cartographic principles.

The best practices in this document are divided into two parts; 1) **Map Parameters** which are the metrics of the mapped area, and 2) the **Reference Information** or Publication Citation Information which are textual descriptions of the supporting information for the map product.

Map Parameters:

These cartographic elements are the technical geographic parameters used to create the map. It is important to include these elements to aid the map reader in interpreting the information displayed.

1) Coordinate system, Projection, and Datum of displayed data:

A geographic coordinate system is a combination of map projection, horizontal and vertical datum and specific parameters that are used to create a set of numbers that define all locations in a given area of the earth. In addition to the name of the coordinate system the official designation of the coordinate system is also appropriate to cite, e.g. *Oregon Statewide Lambert, NAD1983, International Feet, EPSG 2992*.

2) Scale:

The scale of a map is the ratio of a distance on the map to the corresponding distance on the ground. A scale bar is the recommended element to display this ratio because the bar remains accurate when the map is displayed at different sizes.

The map author should be aware that some map projections, such as Web Mercator, have a varied scale between latitude and longitude. When using these projections, it is important to add a notation such as "Map Scale Varies" and omit the scale bar and numeric ratio. In these cases, the use of a graticule should be considered to provide the map reader a method to interpret distances.

Scale bar(s):

Scale bars are a graphical display of distance using units appropriate for the scale and use of the map, e.g. *Miles, Kilometers, Feet, or Meters*.

Numeric Ratio or Scale Text:

A numeric ratio (1:24,000) or scale text (1cm = 1km) are other methods of describing the map to ground ratio. These methods should be used with caution since the scale cannot be preserved when the map is printed or duplicated.

3) Legend or Key:

A legend or map key is a concise visual explanation of the symbols used on the map.

4) Direction Indicator(s):

The direction indicator shows the orientation of the map with reference to the cardinal directions. Often this is shown using a north arrow or compass rose, or with a latitude and longitude graticule. The map author should be aware that some projections, such as conformal conic (State Plane or Oregon Lambert), do not have a uniform direction for north. When using coordinate systems based on these projections to display an extent where cardinal directions are not uniform a latitude and longitude graticule is the preferred method of orienting the map.

These are circumstances when a north arrow is not appropriate or necessary:

- i) a dynamic web map since north is assumed to be at the top of the page,

- ii) the projection has non-uniform direction, or
- iii) the orientation of the map is obvious, such as a statewide or continental map.

Often in conjunction with a north arrow field users will need a magnetic north arrow and degree value to aid in compass use with the map. Since this value changes continually it is important to note the epoch (year) of the magnetic declination value.

Map authors should be cautioned that mapping software packages typically display **grid north**, not **true north** or **magnetic north**.

5) Graticule:

A graticule is a network of lines or ticks, and unit labels for a reference system such as latitude & longitude, Universal Transverse Mercator (UTM), or the Public Land Survey System (PLSS). A graticule is often combined with a map neatline or border.

6) Series index:

A series index is a geographic based index of mapped extents for a map series. This element can be displayed on each map sheet, as a small inset map on each sheet, or a separate index map sheet showing all pages or map sheets of a map series. A common example of this element may be found on each USGS quad sheet.

7) Vicinity or locator map(s):

A vicinity map is a small inset map, or multiple maps, depicting the mapped area within a larger geographic area. This is a helpful tool to give the reader a geographic context for the map.

8) Inset enlargement map(s):

An inset enlargement map is a map of a localized area within the primary map to provide clearer details of the smaller area.

9) Neatline:

A neatline or clipping line is a line delineating the extent of the mapped area such as a state or county outline, or a regular or irregular map edge.

Reference information:

Reference information comprises the complete content description for the map. This informational text increases the utility of the product for the map reader enabling them to have the appropriate reference information about the map.

10) Title:

The title is the name of the map or concise description of the information presented on the map. The title information may also help indicate the intended use of the map.

11) Dates:

Including the appropriate date(s), and time if applicable, is a critical element of the map citation.

- a) **Publication date**
- b) **Data date(s)**, observation date or data collection date
- c) **Valid dates** for use of the map product

12) Map series notation:

A map series is a group of maps with similar theme and scale and a unique identifier for each sheet. The notation will include the series the map is a part of, the sheet number and the total number of sheets in the series, e.g. *Sheet 3 of 5*.

13) Authorship citation:

The organization or individual creating the map including contact information

- a) **Name of organization and/or individual**
- b) **Address**
- c) **Telephone number(s)**
- d) **Email**

14) Logo(s):

A logo is a graphic representing the identity of an organization. The organization producing the map may utilize a logo graphic to give the map an identity for organization(s) or project and help the reader understand the source and/or contributors of the map. It is important to follow appropriate use guidelines for each organization's logo.

15) Source(s):

The source citation is a recognition of organization(s) that originated the various mapped features displayed on the map. It is important for map readers to understand where the mapped data originated including the appropriate dates. Source information may also include the spatial and attribute accuracy, and any modifications of the data displayed on the map.

16) Supporting graphics:

This group of elements includes photographs, graphs, or illustrations adding clarity to the geographic information displayed on the map. It is possible to combine graphs or tables with legends to aid in communication of the themes represented in the map.

17) DRAFT notation:

The text "DRAFT" is used to indicate that the map product does not display a final version of the information.

18) Disclaimer:

Disclaimer language is text used to help limit the liability of the map product. The following is the approved Oregon Geographic Information Council (OGIC) disclaimer language.

This product is for informational purposes, and may not be suitable for legal, engineering, or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Clarification of this information can be included in the disclaimer text or portion of the web map service.

19) Use restriction:

In addition to disclaimers, it is important to note any restrictions or caveats that may exist for use of the map.

20) Copyright:

A copyright is used to protect the content of the map from unauthorized republication. The copyright includes the word “Copyright” and/or symbol, the name of the copyright holder, and the copyright date, *e.g. Copyright © State of Oregon 2014.*

21) Software program(s):

The software used to create the product, the version, and the name of the source file, *e.g. ArcGIS 10.2.2, 20140513_Project_Name.mxd.*

22) Other reference information:

Additional reference information about the map product.

- a) **Explanatory text** Additional text that is appropriate to aid the map user in understanding the subject of the map, the details of the information displayed, and how that information was derived.
- b) **Web URL** The URL (Web (Uniform Resource Locator) is used to access a digital copy of the map or storefront to purchase a copy.
- c) **QR code** A QR (Quick Reference) code is a graphic symbol with an embedded link to an on-line location.
- d) **Project reference code** is an internal number or charge code used by the organization creating the map, *e.g. FPS2298.*
- e) **Funding statement**, acknowledgement of the funding source(s) for the project or map.
- f) **Metadata link**, a document location or web address containing metadata.
- g) **Thesaurus key words**, from a geospatial thesaurus such as those found at gis.oregon.gov.

23) Map Index Grid(s):

A map index grid is a combination of columns and rows or index cells on the border of a map sheet. The combination of letters and numbers provides a means of locating features on the map from an index or gazetteer.