University of Anbar

College of Science

Department of Applied Geology

Field Geology

Title of the lecture

Coordinate Systems

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II. Using Degrees and Decimal Minutes in latitude and longitude coordinate system.

1. **Identify the point of latitude and longitude.**

   You can also use minutes followed by decimal points to identify latitude and longitude. However, you must again start by identifying the broad lines of latitude and longitude. Figure out where the lines of latitude and longitude meet to pinpoint your location. For example, say your location falls at 15°N, 30°W.

2. **Figure out the minutes, including decimal points.**

   Some maps identify minutes followed by decimal points rather than minutes followed by seconds. An online map should be able to provide you with the minutes broken down into decimals for each line of latitude and longitude. For example, a line of latitude may be found at 23.0256 minutes

3. **Determine whether numbers are negative or positive.**

   When using the degrees and decimal minutes system, you do not use directions like north, south, east, and west. Instead, you use positive and negative numbers to determine where locations fall on a map.

   - Remember, lines of latitude fall north or south of the equator. When using decimals to indicate latitude and longitude, positive numbers fall north of the equator and negative numbers fall south of the equator. The number 23.456 falls north of the equator, while the number -23.456 falls south.
   - Lines of longitude fall east or west of the Prime Meridian. Positive numbers fall east of the Prime Meridian, while negative numbers fall west. For example, the number

10.234 falls east of the Prime Meridian while the number -10.234 falls west of the Prime Meridian.

4. **Write out latitude and longitude.**

   To write out the full location, start with the line of latitude. Follow this with the coordinates using minutes and decimals. Add a comma and then the line of longitude followed by its minutes and decimals. Remember to use positive and negative numbers to indicate the direction of coordinates. You do not use the degree symbol with this format.

   - For example, a line falls 15°N, 30°W. Identify the number of minutes and decimals and then write out the coordinates.
   - The above example could be written as, "15 10.234, 30 23.456."

III. Using Decimal Degrees in latitude and longitude coordinate system.

Decimal degrees (DD) express latitude and longitude geographic coordinates as decimal fractions of a degree. DD are used in many geographic information systems (GIS), web mapping applications such as OpenStreetMap, and GPS devices.

1. **Find the latitude and longitude.**

   Degrees of latitude and longitude are often broken down by decimals. Rather than minutes and seconds, lines representing one degree are divided to get decimals pinpointing the exact location. First, find the right degrees of latitude and longitude.

   - For example, say your location falls at 15°N, 30°W.

2. **Figure out the decimals.**

An online map can break down lines of latitude and longitude using decimal points. Usually, decimal points are made up of five numbers.

- For example, your location could be 15.23456 north and 30.67890 west.

3. **Identify whether numbers are positive or negative.**

Rather than using the words north, south, east, and west to indicate direction, positive or negative numbers are used. For lines of latitude, lines north of the equator are positive while lines south of the equator are negative. For lines of longitude, lines east of the Prime Meridian are positive while lines west of the Prime Meridian are negative.

- For example, the line of latitude 15.23456 would be north of the equator, while the line -15.23456 would fall south of the equator.
- A line of longitude written out 30.67890 would fall east of the Prime Meridian, while the line -30.67890 would fall west.

4. **latitude and longitude, including decimals.**

It's simple to use the decimal degrees. You simply write out the line of latitude, including decimals, followed by the line of longitude, including decimals. Use positive or negative numbers to indicate direction.

- For example, say a line falls 15°N, 30°W. Using the decimal degree system, you could write this as "15.23456, -30.67890."

Reference

Angela L. Coe Tom W. Argles David A. Rothery Robert A. Spicer. 2010 GEOLOGICAL FIELD TECHNIQUES, Department of Earth and Environmental Sciences, The Open University, Walton Hall, Milton Keynes, UK