Grid System, Concept of Geoid and Spheroid and Coordinate System

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A **grid system** is a network of horizontal and vertical lines that are used to define locations on a map. It is a way of dividing up the surface of the earth into smaller, more manageable sections. A **coordinate system** is a set of rules that are used to define the location of a point in space. It is used to specify the position of a point relative to a reference point, which is usually the center of the earth.

The **geoid** is defined as the surface of the earth's gravity field, which is approximately the same as mean sea level. It is perpendicular to the direction of gravity pull. Since the mass of the earth is not uniform at all points, and the direction of gravity changes, the shape of the geoid is irregular.

A **spheroid** is a three-dimensional shape created from a two-dimensional ellipse. The ellipse is an oval, with a major axis (the longer axis) and a minor axis (the shorter axis). If you rotate the ellipse, the shape of the rotated figure is the spheroid. The semimajor axis is half the length of the major axis. The semiminor axis is half the length of the minor axis. For the earth, the semimajor axis is the radius from the center of the earth to the equator, while the semiminor axis is the radius from the center of the earth to the pole. One particular spheroid is distinguished from another by the lengths of the semimajor and semiminor axes.

Fig: Grid System

A **coordinate system** is a set of rules that are used to define the location of a point in space. It is used to specify the position of a point relative to a reference point, which is usually the center of the earth. There are two main types of coordinate systems: **geographic coordinate systems** and **projected coordinate systems**. A geographic coordinate system uses a three-dimensional spherical surface to determine locations on the earth. Any location on earth can be referenced by a point with longitude and latitude coordinates. A projected coordinate system is a flat, two-dimensional representation of the Earth.