

THE INTEGRATION OF SPATIAL AND TEMPORAL INFORMATION IN ECLIPSE MAPS

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Eclipse maps are remarkable cultural artifacts that are only applicable for a narrow band of the Earth on a single day, yet considerable work has been done since 1654 to produce these guides to the glory of solar eclipses.

A wealth of information is presented through eclipse maps: the time evolution of an eclipse, the geographic extent of the central and penumbral eclipse paths, the local circumstances of the joining of the Sun and Moon, and the geographic context for selecting optimum observation locations.

Since the 17th century, eclipse cartography has evolved with changing functional requirements, improved modeling of the solar system, increased geographical knowledge, and increasingly sophisticated presentation of spatial and temporal information.

Early eclipse maps are remarkably well-designed and continue to offer lessons to present-day eclipse cartographers. Eclipse maps are among the earliest thematic maps produced and perhaps the earliest temporal maps. A key purpose of some early eclipse maps was to support the determination of the geographic longitude of a location and later for expedition planning. Early eclipse cartographers employed uncommon map projections that are well suited for the geographic extent of eclipses and these projections remain useful to this day.

The progression of eclipse cartography continues to the present day with the advent of high-precision eclipse mapping built on new lunar terrain models and detailed topographic data. Modern geographic information systems (GIS) technology advances the presentation of map information through analytic functions, detailed geographic layers, animations, and interactive maps.