

Deformation Models - Progress with development of an OGC Standard

Richard Stanaway (Quickclose), Chris Crook (Land Information New Zealand), Kevin Kelly (ESRI) and Roger Lott (IOGP)

Abstract. IAG WG 1.3.1 (Time-dependent transformations between reference frames in deforming regions) has been working in close association with the Open Spatial Geospatial Consortium (OGC) CRS Domain Working Group since 2020. The aim has been to develop specifications for both a functional deformation model and an associated geodetic grid exchange format (GGXF). These will eventually be refined into an OGC standard for adoption in geodetic applications. In deforming zones, a globally recognised grid-based time-dependent transformation standard is essential to ensure precise alignment of positioning (especially GNSS-PPP) and spatial data on different temporal and spatial scales. Existing conformal transformation approaches are proving inadequate outside stable plate regions and a usable alternative approach and standard is required to take better advantage of the rapid improvements in modern positioning and spatial data technologies.

This paper summarises both WG efforts to date. Basic principles and requirements of deformation models in geodetic applications such as positioning, reference frame transformations and GIS are reviewed. Results of a global geodetic agency survey on the usage and requirements of deformation models are summarised and the final draft specification for deformation models will be presented with a brief summary of the GGXF development to date.