UK Location Programme

**UK Location Information Infrastructure
Technical Policy Paper:
Coordinate Reference Systems for UK
Location - INSPIRE View Service V1.1**

DOCUMENT CONTROL

Change Summary

Version	Date	Author/Editor	Change Summary
0.1	10/03/2011	Paul Cruddace	
0.3	31/03/2011	Paul Cruddace	Amendments from DCG or LIIB & DPWG
1.0	15/11/2011	Mark Greaves	No changes, base lined at v1.0 for publication
1.1	24/12/2012	Mark Greaves	All urn: identifiers changed to http://

References

Ref.	Title/Version/Publication Date/Author
[1]	Coordinate Reference Systems Data Specification http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_Specification_CRS_v3.1.pdf
[2]	Technical Guidance to implement INSPIRE View Services http://inspire.jrc.ec.europa.eu/documents/Network_Services/Technical_Guidance_View_Services_v2.12.pdf
[3]	European Petroleum Survey Group (EPSG) Geodetic Parameter Dataset http://www.epsg-registry.org/

CONTENTS

1 INTRODUCTION

1.1 Purpose

1   The purpose of this document is to outline the Coordinate Reference Systems (CRS) and projections recommended for adoption within the official UK Location Information Infrastructure (UKLII) View Service. There is also guidance for data publishers who choose to develop their own View Service.

2   This document represents an initial position for UKLII View Services aimed at:

- fulfilling INSPIRE obligations,

- maintaining continuity,

- short term management of the risks associated with the costs of creating & maintaining multiple tiling pyramids.

3   Once the operations around Web Map Tiling Service (WMTS) and UK datasets are better understood extensions to the recommendations below may be considered.

4   This version of the paper does not consider the height dimension

5   EPSG codes are taken from [3].

2 RECOMMENDED CRS FOR UK VIEW SERVICE

2.1 Recommendations

6   The CRS / projections that will be available for use within the official UKLII View Service are outlined below from 1 to 5.

2.1.1 Mandated Systems

7   UK will adopt the INSPIRE mandated systems for View Services [2] within the UKLII. There are two geographical CRS, one for regions of continental Europe (ETRS89), and one for regions outside of continental Europe (ITRS). It follows that ITRS should also be used for datasets with global reach or where there are existing international standards in place;

1.   2d Geographical coordinate system based on ETRS89 in continental Europe (including the United Kingdom) - *http://www.opengis.net/def/crs/EPSG/0/4258*

2.   2d Geographical coordinate system based on ITRS outside of continental Europe - *http://www.opengis.net/def/crs/EPSG/0/4326* (WGS 84 2d)

8   The WGS 84 and ETRS89 CRS are diverging at a rate of approximately 2.5cm/year. In 2011 therefore there is a difference between a coordinate in WGS 84 and ETRS89 of around 55cm. For many datasets at low spatial precision, they can be said to be equivalent.

2.1.2 Additional Systems

9   For the land area, UK will also adopt the current national grid systems used in Great Britain and Northern Ireland - the most common land-based CRSs / projections that data providers store their data in. This also facilitates a more representative viewing experience - Appendix A shows the effect of viewing data within the ETRS89 Geographical CRS (from 2.1.1) and OSGB 1936 / British National Grid (from 2.1.2). Projections to be adopted are;

1.   OSGB 1936 / British National Grid, *http://www.opengis.net/def/crs/EPSG/0/27700*

2.   TM 75 / Irish Grid, *http://www.opengis.net/def/crs/EPSG/0/29903*

3.   ETRS89 / Irish Transverse Mercator, *http://www.opengis.net/def/crs/EPSG/0/2157*

10   As stated in [1], for pan-European spatial analysis and reporting where true area representation is required, a regional authalic (equal area) projection is recommended. A regional conformal (shape-preserving) projection is planned to be incorporated into the UKLII View Service once the first release has been evaluated (see 3.3 below);

1.   ETRS89 Lambert Azimuthal Equal Area (ETRS89-LAEA) projection, *http://www.opengis.net/def/crs/EPSG/0/3035*

3   IMPLEMENTATION CONSIDERATIONS

3.1   Availability in Publication Platforms

3.1.1   UKLII publication platform

11   The official UKLII publication platform is based on GeoServer and all of the CRS / projections outlined in 2.1.1 and 2.1.2 (1-5) are available in GeoServer out of the box.

3.1.2   3rd party publication platforms

12   Generally other products such as MapServer and proprietary platforms use the EPSG coordinate systems. However it is the data publisher's responsibility to verify this.

3.2   Default CRS

13   Typically a broad view of the UK and all marine views will use the ETRS89 systems - whereas land based views would use the prevailing national coordinate system (Great Britain or Ireland) as default systems.

14   As a result of the 80:20 rule, it is recommended that the default view for land based UKLII View Services is OSGB 1936 / British National Grid in Great Britain and the preferred system used in Northern Ireland. These are generally valid up to 10km offshore and should be used to meld land and offshore datasets out to this distance.

15   Note the land based coordinate systems in Great Britain and Ireland (2) do not overlap.

16   Note: If a data publisher is developing their own View Service, it is mandatory to use geographical coordinate system based on ETRS89 in continental Europe (CRS 1 in 2.1.1) and ITRS outside continental Europe (CRS 2 in 2.1.1). At a minimum, the CRS of the data publisher (if different) is also required. To aid interoperability, this should be looked to be extended either initially, or over time, to at least one more CRS / projection from 2.1.2, if not all of them

3.3   Additional Coordinate Systems

17   It is understood that not all current data provider CRS's are covered by the above list at this stage, but it is believed that the vast majority are.

18   Other systems may be adopted in this policy (and may already be available within GeoServer and other platforms) once the initial 2011 deadlines have been met and the cost implications are better understood as well as potential coordinate based data specifications in Annex II & III (grid coverages eg orthoimages & elevation). This includes the projection at 2.1.2 (6) above.

19   Data providers are not prevented from using other coordinate systems – they do so at their own risk in terms lack of interoperability with third party datasets, hence take up in some applications and the cost implications of establishing and maintaining several tiling pyramids.

APPENDIX A

OSGB 1936 / British National Grid, *http://www.opengis.net/def/crs/EPSG/0/27700*, "Coordinate based" orthoimage of Cowes IoW

2d Geographical coordinate system based on ETRS89 in continental Europe - *http://www.opengis.net/def/crs/EPSG/0/4258*, "Pixel-based latitude & longitude" image display of part of the Cowes image above.