

New GDA2020 web services available from October 2021

New GDA2020 web services are available via the [Spatial Collaboration Portal](#) (SCP).

Why release new GDA2020 web services?

Historically, Spatial Services web services were published as WGS 84 / Web Mercator aligned to GDA94, however, the [potential for misalignment when combining WGS 84 and GDA2020 data](#) is well documented.

New GDA2020 services are needed to support GDA2020-aligned environments and applications.

Two new product lines for different data types: **'multiCRS'** and **'GDA2020'**

Two different GDA2020-aligned web service formats are available, depending on the type of data (vector or raster):

1) Vector data (for example, points and polygons) => **'multiCRS'** services

GDA2020-aligned service, example: [NSW Land Parcel Property Theme multiCRS](#) (CRS = GDA2020)

Compare existing service, example: [NSW Land Parcel Property Theme](#) (CRS = WGS 84-aligned-to-GDA94)

Named **'multiCRS'** because these services can be requested in **multiple** **C**oordinate **R**eferences **S**ystems (CRS) including GDA94, GDA2020, WGS 84, etc. Default transformations are defined as an integral part of the web service, which ensures that the NTV2-CPD⁽¹⁾ grid is used and that WGS 84 aligns with GDA2020 by default.

2) Raster data (for example, cached-tile imagery or basemaps) => **'GDA2020'** services

GDA2020-aligned service, example: [NSW Imagery GDA2020](#) (CRS = WGS 84-aligned-to-GDA2020)

Compare existing service, example: [NSW Imagery](#) (CRS = WGS 84-aligned-to-GDA94)

These services supply cached tiles as WGS 84-aligned-to-GDA2020 by applying the NTV2-CPD⁽¹⁾ grid to simply shift existing WGS 84-aligned-to-GDA94 tiles by the required number of pixels. Raster tiles are still provided as WGS 84 products because some applications do not yet consume raster tiles in other CRS.

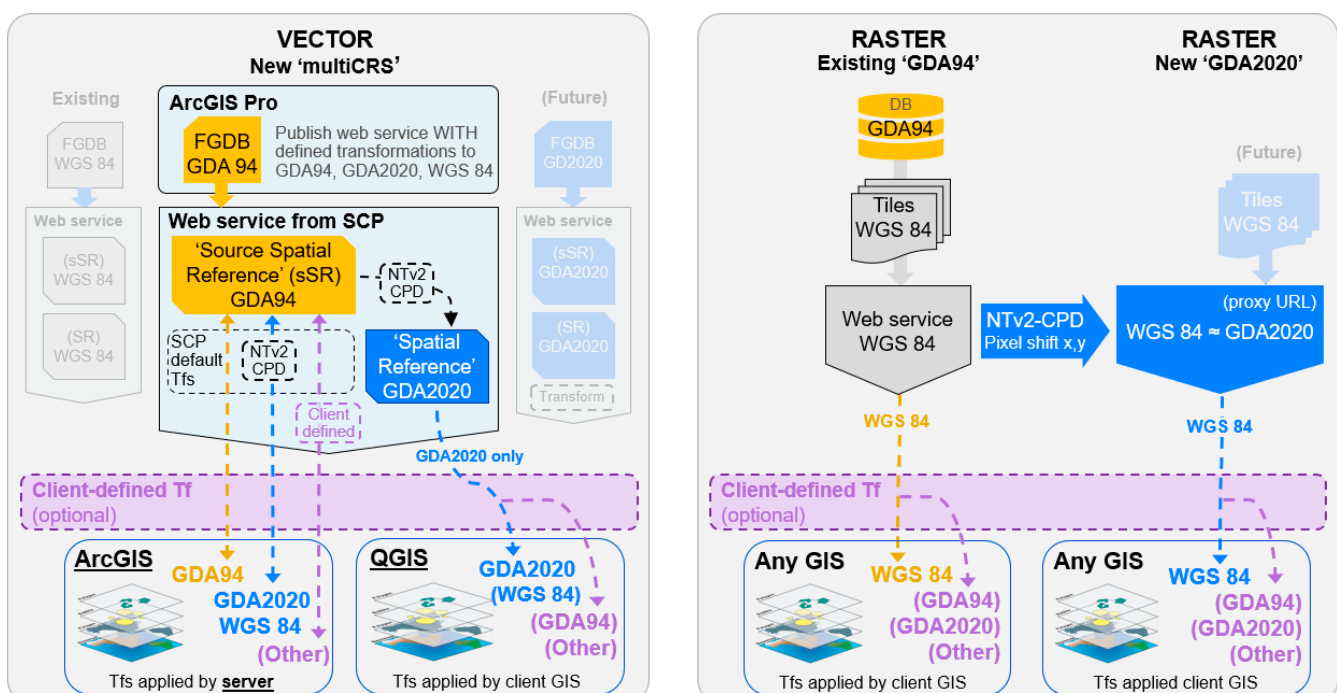


Figure 1: GDA2020 web services. The CRS of request, and transformations defined by Portal and client, all affect service delivery.

Note⁽²⁾: ArcGIS requests 'multiCRS' services from the **source Spatial Reference**; other GIS request from the **Spatial Reference**.

How do I find and access the new GDA2020 web services?

New GDA2020 web services are available via the [Spatial Collaboration Portal](#) (SCP) and can be discovered by adding 'GDA2020' to your search terms. [A collection of all 'multiCRS' and 'GDA2020' services](#) has also been made available.

SCP descriptions for these services are clearly identified as GDA2020-aligned and have metadata indicating 'WGS 84 equivalent to GDA2020'. The URL for each service can be found on the SCP description page.

Notes on accessing the new services:

- **'multiCRS'** (vector data) services have the same look and feel as existing ArcGIS server products. General information on loading ArcGIS server web services can be found on the [Spatial Services website](#).
- **'GDA2020'** (raster tiles) services do not (yet) behave exactly like current ArcGIS server products. To add raster services to an application, see brief instructions below. For more detail see this [FAQ](#).
 - » **ArcGIS Pro / Portal: Add data > Add data from Path / Web / URL** and provide the MapServer URL, e.g. https://portal.spatial.nsw.gov.au/tileservicesGDA2020/rest/services/public/NSW_Imagery_GDA2020/MapServer
 - » **QGIS: XYZ Tiles > New Connection** and provide the full MapServer URL plus 'tile/{z}/{y}/{x}', e.g. https://portal.spatial.nsw.gov.au/tileservicesGDA2020/rest/services/public/NSW_Imagery_GDA2020/MapServer/tile/{z}/{y}/{x}
 - » **ArcMap:** Connect ArcMap to SCP (See [FAQ](#)) then **File > Portal for ArcGIS > (search for dataset) > Add**.

Which service should I use for my GDA94, GDA2020 or WGS 84 application?

| Table 1: How to employ multiCRS and GDA2020 web services [for Arc/ESRI clients ⁽²⁾] | | |
|---|---|--|
| GIS Environment / Application | Vector Data (points, polygons) Use 'multiCRS' service e.g. SurveyMarkGDA94_multiCRS | Raster Data (Imagery, Basemaps) Use 'GDA2020' web service e.g. NSW_Imagery_GDA2020 |
| GDA2020 | Aligns with GDA2020 data | Aligns with GDA2020 data |
| GDA94 | Aligns with GDA94 data | Set client-side WGS 84 <NTv2> GDA94 ⁽³⁾ OR use WGS 84 ≈ GDA94 service |
| WGS 84 ≈ GDA2020 | Aligns with GDA2020 data | Aligns with GDA2020 data |
| WGS 84 ≈ GDA94 | Set client-side WGS 84 <null> GDA94 ⁽³⁾ OR use WGS 84 ≈ GDA94 service | Cannot transform WGS 84 <> WGS 84 Use WGS 84 ≈ GDA94 service |

Note⁽²⁾: Refer to footnotes for more information on supporting other GIS clients.

Note⁽³⁾: Users often have flexibility to define 'client-side' transformations in their GIS or application, to transform data on-the-fly into to the CRS of their project. Refer to your software provider for more information.

Do I have to set client-side transformations? Known GIS idiosyncrasies:

It is recommended to always set client-side transformations in your GIS or application. Some software has been shown to over-write default service transformations with 'null' or other internal defaults, unless explicitly set by the client.

For example, **in one common GIS package**, unless the client has set transformations locally:

- **The first transformation in the pick-list is automatically selected** when loading any new dataset, or when changing the project/map CRS
- **'multiCRS' FeatureServers show scale-dependent behaviour**, successfully transforming at smaller scale / zoom (e.g. 1:2000) but failing to transform at larger scale / zoom (e.g. 1:500).

For best results, you can mirror the transformations set in the multiCRS services:

- GDA94 < **EPSG:8447 NTv2-CPD⁽¹⁾** > GDA2020
- GDA94 < **EPSG:9689 NTv2-CPD⁽¹⁾** > WGS 84-aligned-to-GDA2020
- GDA2020 < **EPSG:8450 NULL** > WGS 84-aligned-to-GDA2020
- Alternatively, you can set custom transformations. Refer to your software provider for more information. This can be useful if your application does not yet support some of the new EPSG codes above.

New services catering for the supply and alignment of data in multiple datums has identified various application-specific issues which were previously hidden or untested. Additional feedback is welcomed, as described below.

Why are these services published from a GDA94 Database / FGDB (Figure 1)?

DCS Spatial Services is currently publishing data from an underlying GDA94 database, with plans to update our architecture to be natively GDA2020 over the next few years. In line with the [GDA2020 Information Sheet](#): 'Provided we can receive and supply data in GDA2020, internal workflows can remain in GDA94 until it is feasible to update.'

These services will update to a 'GDA2020 source' in line with the underlying database, with little to no effect on users.

Will existing WGS 84-aligned-to-GDA94 services still be available? Until when?

The new 'multiCRS' and 'GDA2020' named URLs will be temporary, to provide a demonstration of GDA2020-aligned services. However, GDA2020-aligned web services are expected to replace existing GDA94-aligned services over time.

Until June 2022, new GDA2020-aligned services will be offered in parallel with existing GDA94-aligned services. This will allow users to test new web service capabilities and GDA2020-alignment in existing and new applications.

After June 2022 the 'multiCRS' and 'GDA2020' URLs will be deprecated, and existing web service URLs will adopt the demonstrated GDA2020-alignment and capabilities. More information and timeline will be provided closer to that date. Consuming GDA2020-aligned services into GDA94 environments can still be achieved as described in Table 1 above.

[NSW GDA2020 and AGRS Implementation Policy](#) (Oct 2021) details Spatial Services support for GDA94 and WGS 84.

Are there also WFS, WMS (OGC compliant) services supporting GDA2020?

New GDA2020 services are published as ArcGIS REST format. OGC compliant WFS and WMS have not yet been tested for multiCRS and GDA2020 support. Feedback on OGC compliant WFS / WMS services is welcomed.

Where can I provide feedback?

We invite stakeholders to test these new services across a wide range of applications, and to provide feedback. Specific feedback on datum-alignment, accessibility and efficiency, and software-specific experiences are all useful.

Where possible, compare your experience against the equivalent existing WGS 84-aligned-to-GDA94 services. Feedback is welcomed via the [Spatial Services Customer Hub](#).

Where can I learn more about other GDA2020 products and services?

Spatial Services continues to develop additional services supporting GDA2020.

Contact our Service Delivery team via the [Customer Hub](#) to register your interest in GDA2020 products.

Additional information on GDA2020 can be found at the following links:

- www.spatial.nsw.gov.au/products_and_services/spatial_data
- www.icsm.gov.au/gda2020
- www.spatial.nsw.gov.au/surveying/geodesy/gda2020

Footnotes:

¹ NTV2-CPD transformation grid is recommended for all spatial data transformations in NSW. Refer to www.spatial.nsw.gov.au/surveying/geodesy/transformation_methods, and [NSW GDA2020 and AGRS Implementation Policy](#). 'multiCRS' services explicitly define GDA94 <NTV2-CPD> GDA2020, GDA94 <NTV2-CPD> WGS 84, with fall back to conformal at Lord Howe Island.

² Arc/ESRI clients request directly from the web service '**source Spatial Reference**' (**ssR**) and instructs the server to carry out a transformation to the CRS of the map/project using ESRI Portal's default transformations; if the client has defined any user-defined transformation(s), then these will be applied instead. These transformations are then carried out by the **server** before delivery.

This behaviour is different for other GIS applications, such as QGIS, which tend to request the service in its nominal '**Spatial Reference**' (**SR**), and then apply any additional client-defined transformations on the client-side to arrive at the map/project CRS.

Note: QGIS can request in other Spatial Reference(SR) but only where the service is configured to support more than one SR.

Note: Existing WGS 84 ≈ GDA94 vector services have sSR and SR both set to WGS 84, with no transformations explicitly defined.

³ GIS and applications often have the flexibility to define 'client-side' (including custom) transformations, to combine data on-the-fly from various CRS into the CRS of the map/project/application. Refer to your software provider for information.