



NGDS Naming Conventions

A Primer

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Section 1: Introduction

This document provides an overview of the naming conventions used to facilitate [interoperability](#) with regard to [web services](#) deployed by [subrecipients](#) for the [AASG Geothermal Data](#) project, which is a subset of the [National Geothermal Data System \(NGDS\)](#).

NGDS naming conventions occupy a tricky organizational niche within the NGDS: until this point they have not been officially documented, but they are effectively mandatory in that web services that do *not* comply with these naming conventions are invalid and thereby not part of NGDS.

Consequently: understanding and using these naming conventions is critical to maintaining the integrity of NGDS.

This document is designed to facilitate the understanding and use of NGDS naming conventions.

Section 2: How to Implement NGDS Naming Conventions

Data providers implement [National Geothermal Data System \(NGDS\)](#) naming conventions when deploying data as a [web service](#) by providing appropriate information at both the **service** level and the **layer** level; this information must conform to NGDS conventions.

Service-level information includes the following:

- *The Service Name*
 - In an ArcGIS environment, the *Service Name* is specified on the first page of the **Add New Service** wizard in ArcMap; note that the *Service Name* is *not* the name of the ArcMap project (*.mxd file) from which the web service is deployed (though the two can be identical without violating NGDS naming conventions)
 - In a GeoServer environment, the *Service Name* is referred to as a *workspace*
- The [XML namespace](#) that *identifies* the [schema](#) to which the data being deployed has been mapped (see below for more information)
 - In an ArcGIS environment, the XML namespace is provided when specifying the [web feature service](#) capabilities of your web service
 - In a GeoServer environment, the XML namespace is provided when creating a workspace

Layer-level information includes the following:

- *Layer Name*: The name of a data layer within the service; there can be multiple layers in a single service
 - In an ArcGIS environment, users can, and often do, choose to deploy a service using the layer names specified in the ArcMap project (*.mxd file) from which the server has been deployed; if so, then the layer names in the ArcMap project (*.mxd file) from which the server has been deployed should conform to NGDS naming conventions

- In a GeoServer environment, layer names are specified when adding layers to a workspace

The exact Service Name, XML namespace, and Layer Names specified by the user when deploying their data as a web service will vary depending on the data being deployed and the [schema](#) to which that data has been [mapped](#). For more information on the process of web service deployment, see the [GeoSciML-Portrayal Cookbook](#).

Section 3: Web Services and Schemas

To briefly summarize the relationship between [web services](#) and [schemas](#): *web services* are used by the [National Geothermal Data System](#) project to deploy data that has been [mapped](#) to an [interchange format](#) structured by a [schema](#) provided by NGDS content models (for more information about NGDS content models, see the [NGDS Content Model Tutorial](#)).

As indicated above, users will conform to different naming conventions depending on the schema to which the data they are deploying as a web service is mapped; the schema to which the data is mapped depends on the kind of data being deployed. For example, data describing a water chemistry analysis would be mapped to an AqueousChemistry schema; when deployed, AqueousChemistry naming conventions would be used.

AASG Geothermal Data naming conventions are enumerated by schema in Table 1; see below for a description of each [field](#) in the table:

Schema	Current Version	Service Name	Layer Name
ActiveFault	1.2	**ActiveFaults	ActiveFault
ActiveFault	1.5	**ActiveFaults	ActiveFault
AqueousChemistry	1.9	**aqWellChemistry	WaterQuality
AqueousChemistry	1.9	**aqSpringChemistry	CommonAnalytes
AqueousChemistry	1.9	**AqueousChemistry	BaseMetals
AqueousChemistry	1.9	**AqueousChemistry	MajorDissolvedConstituents
AqueousChemistry	1.9	**AqueousChemistry	MinorDissolvedConstituents
AqueousChemistry	1.9	**AqueousChemistry	Nitrogen
AqueousChemistry	1.9	**AqueousChemistry	WaterDissolvedGas

AqueousChemistry	1.9	**AqueousChemistry	FreeGas
AqueousChemistry	1.9	**AqueousChemistry	WaterIsotopes
AqueousChemistry	1.9	**AqueousChemistry	GasIsotopes
AqueousChemistry	1.9	**AqueousChemistry	IsotopesDissolved
BoreholeLithIntercept	1.1	**BoreholeLithIntercepts	BoreholeLithIntercept
BoreholeLithInterval	0.9	**BoreholeLithIntervals	BoreholeLithInterval
Borehole Temperature	1.5	**BoreholeTemperatures	BoreholeTemperature
Borehole Temperature	1.6	**BoreholeTemperatures	N/A
ContactView	2.0	N/A	ContactView
DirectUseSite	1.5	**DirectUseSites	DirectUseSite
DrillStemTest	1.8	**DrillStemTests	DrillStemTest
DrillStemTest	1.9	**DrillStemTests	DrillStemTest
EventHypocenter	1.7	**SeismicHypocenters	Hypocenter
FaultFeature	1.0	**Faults	Fault
FaultFeature	1.1	**Faults	Fault
FluidFluxInjection	1.1	**FluidFluxInjection	FluidFluxInjection
FluidProduction	1.1	**FluidProduction	FluidProduction
GeologicUnitView	2.0	N/A	GeologicUnitView
GeothermalArea	0.5	**GeothermalAreas	GeothermalArea
GeothermalFluidProduction	1.1	**GeothermalFluidProduction	GeothermalFluidProduction
Geothermometry	0.1	**Geothermometry	Geothermometry
HeatFlow	1.23	**HeatFlow	HeatFlow

HeatPumpFacility	0.6	**HeatPumpFacilities	HeatPumpFacility
PowerPlantFacilities	0.2	**PowerPlants	PowerPlant
PowerPlantProduction	0.8	**PlantProduction	PlantProduction
RockChemistry	0.4	**RockChemistry	U-Series
RockChemistry	0.4	**RockChemistry	IsotopeSeries
RockChemistry	0.4	**RockChemistry	TraceElements
RockChemistry	0.4	**RockChemistry	WRMajorElements
RockChemistry	0.4	**RockChemistry	StableIsotopes
RockChemistry	0.4	**RockChemistry	RareEarth
RockChemistry	0.4	**RockChemistry	Volatiles
RockChemistry	0.4	**RockChemistry	NobleGasses
ShearDisplacementStructure	2.0	N/A	ShearDisplacementStructure
ThermalConductivity	2.0	**ThermalConductivity	ThermalConductivity
ThermalSpring	1.6	**ThermalSprings	ThermalSpring
ThermalSpring	1.8	**ThermalSprings	N/A
VolcanicVent	1.4	**VolcanicVents	VolcanicVent
Wellheader	1.5	**Wellheaders	Wellheader
Wellheader	1.7	**Wellheaders	N/A
WellLog	0.8	**WellLogs	WellLog

*Table 1: AASG Geothermal Data naming conventions, listed by schema; entries highlighted in red represent schemas that have not yet been deployed; entries highlighted in gray represent schemas that are deprecated but remain in use; a pair of asterisks (**) indicates a pair of "wildcard" characters that should be replaced with the appropriate state abbreviation (such as AZ for Arizona)*

The fields in Table 1 are as follows:

- **Schema:** The NGDS schema used to structure the data deployed by the user
- **Current Version:** The most up-to-date version of the NGDS schema listed in the **Schema** column; multiple versions of a given schema indicate that a transition to a newer version of that schema is in progress
- **Service Name:** Conventions for NGDS **Service Names**; here, a pair of asterisks (**) indicates a pair of "wildcard" characters that should be replaced with the appropriate state abbreviation. For example:
 - An Arizona web service structured by the RockChemistry schema would use the Service Name **AZRockChemistry**
 - A California web service structured by ThermalSpring schema would use the Service Name **CAThermalSprings**
- **Layer Name:** Conventions for NGDS **Layer Names**. For example:
 - A layer containing data describing water quality in a web service structured by the AqueousChemistry schema would be called WaterQuality
 - A layer containing data describing a rock isotope analysis in a web service structured using the RockChemistry schema would be called IsotopeSeries

Note that these naming conventions should be adhered to *exactly* with regard to capitalization, spacing, punctuation, plurality, and state abbreviation.

For a list of hyperlinks that [dereference](#) to representations of the schemas described in Table 1, see [Table 3](#).

Section 4: Schemas and Namespaces

As indicated previously, [XML](#) namespaces are part of [National Geothermal Data System \(NGDS\)](#) service-level naming conventions. Compliance with NGDS naming conventions means specifying a namespace that [identifies](#) the [schema](#) used to structure the data being deployed by the [web service](#). An XML namespace can be provided when creating the web service:

- In an ArcGIS environment, the namespace is provided when specifying the [web feature service](#) capabilities of your web service
- In a GeoServer environment, the namespace is provided when creating a workspace

For a more detailed examination of XML and XML namespaces, see the [USGIN XML Tutorial](#).

Table 2 contains a list of namespaces enumerated by the schemas they identify; see below for a description of each [field](#) in the table.

Schema and Version	Namespace	Prefix
ActiveFault 1.2	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/activefault/1.2	aasg

ActiveFault 1.5	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/activefault/1.5	aasg
AqueousChemistry 1.9	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/aqueouschemistry/1.9	aasg
BoreholeLithIntercept 1.1	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/bhlithintercept/1.1	aasg
BoreholeLithInterval .9	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/bhlithinterval/0.9	aasg
Borehole Temperature 1.5	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/boreholetemperature/1.5	aasg
Borehole Temperature 1.6	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/boreholetemperature/1.6	aasg
ContactView 2.0	http://xmlns.geosciml.org/geosciml-portrayal/2.0	gsmlp
DirectUseSite 1.5	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/directusesite/1.5	aasg
DrillStemTest 1.8	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/drillstemtest/1.8	aasg
DrillStemTest 1.9	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/DrillStemTest/1.9	aasg
EventHypocenter 1.7	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/hypocenter/1.7	aasg
FaultFeature 1.0	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/fault/1.0	aasg
FaultFeature 1.1	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/fault/1.1	aasg
FluidFluxInjection 1.1	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/fluidfluxinjection/1.1	aasg
FluidProduction 1.1	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/fluidproduction/1.1	aasg
GeologicUnitView 2.0	http://xmlns.geosciml.org/geosciml-portrayal/2.0	gsmlp
GeothermalArea 0.5	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/geothermalarea/0.5	aasg
GeothermalFluidProduction 1.1	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/geothermalfluidproduction/1.1	aasg
Geothermometry 0.1	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/geothermometry/0.1	aasg
HeatFlow 1.23	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/heatflow/1.23	aasg
HeatPumpFacility 0.6	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/HeatPumpFacility/0.6	aasg
PowerPlantFacilities 0.2	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/PowerPlant/0.2	aasg

PowerPlantProduction 0.8	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/PowerPlantProduction/0.8	aasg
RockChemistry 0.4	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/rockchemistry/0.4	aasg
ShearDisplacementStructure 2.0	http://xmlns.geosciml.org/geosciml-portrayal/2.0	gsmlp
ThermalConductivity 2.0	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/thermalconductivity/2.0	aasg
ThermalSpring 1.6	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/thermalspring/1.6	aasg
ThermalSpring 1.8	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/thermalspring/1.8	aasg
VolcanicVent 1.4	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/volcanicvent/1.4	aasg
Wellheader 1.5	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/wellheader/1.5	aasg
Wellheader 1.7	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/wellheader/1.7	aasg
WellLog 0.8	http://stategeothermaldata.org/uri-gin/aasg/xmlschema/welllog/0.8	aasg

Table 2: XML namespaces that identify NGDS schemas; namespaces are listed by schema; entries highlighted in red represent schemas that have not yet been deployed; entries highlighted in gray represent schemas that are deprecated but remain in use

The fields in Table 2 are as follows:

- **Schema and Version:** The most up-to-date version of the NGDS schema used to structure the data deployed by the user; multiple versions of a given schema indicate that a transition to a newer version of that schema is in progress
- **Namespace:** The XML namespace that identifies the corresponding schema in the **Schema and Version** column
- **Prefix:** The XML prefix that is used to invoke the namespace later in the [capabilities document](#) of the web service deployed by the user (see below)
 - **aasg** indicates an [AASG Geothermal Data](#) schema
 - **gsmlp** indicates a GeoSciML-Portrayal schema; GeoSciML-Portrayal schemas are used for NGDS web services with line and polygon geometry (as opposed to mere points on a map); for more information, see the [GeoSciML-Portrayal Cookbook](#)

To provide a more concrete example, the capabilities document of a live web service containing data structured by the AqueousChemistry schema would appear as follows:

- In the *root element* of the capabilities document, the **XML namespace** attribute (**xmlns**) is used to **bind** the **aasg** prefix (which functions here as an **attribute**) with the corresponding namespace listed in the table above, thereby *declaring* the namespace, like so:

```
xmlns:aasg="http://stategeothermaldata.org/uri-gin/aasg/xmlschema/aqueouschemistry/1.9"
```

- Having been declared as a namespace using the **xmlns** attribute, the **aasg** prefix can now be used to refer back to and invoke this namespace at any time by modifying an existing *element*, like so:

```
<wfs:Name>aasg:WaterQuality</wfs:Name>
```

Here, the **aasg** prefix modifies the content within the **Name** element (itself modified by the **wfs** prefix, also declared in the root element of this capabilities document), thereby indicating that the content of the **Name** element should be interpreted within the context of the AqueousChemistry schema identified by the namespace indicated by the **aasg** prefix.

For help interpreting the above, the [USGIN XML Tutorial](#) is *strongly* recommended, particularly the section on [prefixes and namespaces](#).

Section 5: Schema Links

Table 3 contains a list of hyperlinks that [dereference](#) to [XML](#) representations of [National Geothermal Data System \(NGDS\) schemas](#); see below for a description of each [field](#) in the table.

Schema and Version	Link to Schema
ActiveFault 1.2	http://schemas.usgin.org/schemas/ActiveFault1.2.xsd
ActiveFault 1.5	http://schemas.usgin.org/schemas/ActiveFault1.2.xsd
AqueousChemistry 1.9	http://schemas.usgin.org/schemas/AqueousChemistry1.9.xsd
BoreholeLithIntercept 1.1	http://schemas.usgin.org/schemas/BoreholeLithIntercept1.1.xsd
BoreholeLithInterval .9	http://schemas.usgin.org/schemas/BoreholeLithInterval0.9.xsd
Borehole Temperature 1.5	http://schemas.usgin.org/schemas/BoreholeTemperature1.5.xsd
Borehole Temperature 1.6	http://schemas.usgin.org/schemas/BoreholeTemperature1.6.xsd
ContactView 2.0	https://www.seegrid.csiro.au/subversion/GeoSciMLTV/trunk/schema/geosciml-portrayal2.0.xsd

DirectUseSite 1.5	http://schemas.usgin.org/schemas/DirectUseSite1.5.xsd
DrillStemTest 1.8	http://schemas.usgin.org/schemas/DrillStemTest1.8.xsd
DrillStemTest 1.9	http://schemas.usgin.org/schemas/DrillStemTest1.9.xsd
EventHypocenter 1.7	http://schemas.usgin.org/schemas/EventHypocenter1.7.xsd
FaultFeature 1.0	http://schemas.usgin.org/schemas/Fault1.0.xsd
FaultFeature 1.1	http://schemas.usgin.org/schemas/Fault1.1.xsd
FluidFluxInjection 1.1	http://schemas.usgin.org/schemas/FluidFluxInjection1.1.xsd
FluidProduction 1.1	http://schemas.usgin.org/schemas/FluidProductionObservation1.1.xsd
GeologicUnitView 2.0	https://www.seegrid.csiro.au/subversion/GeoSciMLTV/trunk/schema/geosciml-portrayal2.0.xsd
GeothermalArea 0.5	http://schemas.usgin.org/schemas/GeothermalArea0.5.xsd
GeothermalFluidProduction 1.1	http://schemas.usgin.org/schemas/GeothermalFluidProductionObservation1.1.xsd
Geothermometry 0.1	http://schemas.usgin.org/schemas/Geothermometry0.1.xsd
HeatFlow 1.23	http://schemas.usgin.org/schemas/HeatFlow1.23.xsd
HeatPumpFacility 0.6	http://schemas.usgin.org/schemas/HeatPumpFacility0.6.xsd
PowerPlantFacilities 0.2	http://schemas.usgin.org/schemas/PowerPlantFacility0.2.xsd
PowerPlantProduction 0.8	http://schemas.usgin.org/schemas/PowerPlantProduction0.8.xsd
RockChemistry 0.4	http://schemas.usgin.org/schemas/RockChemistry0.4.xsd
ShearDisplacementStructure 2.0	https://www.seegrid.csiro.au/subversion/GeoSciMLTV/trunk/schema/geosciml-portrayal2.0.xsd
ThermalConductivity 2.0	http://schemas.usgin.org/schemas/ThermalConductivity2.0.xsd
ThermalSpring 1.6	http://schemas.usgin.org/schemas/ThermalSpring1.6.xsd
ThermalSpring 1.8	http://schemas.usgin.org/schemas/ThermalSpring1.8.xsd

VolcanicVent 1.4	http://schemas.usgin.org/schemas/VolcanicVent1.4.xsd
Wellheader 1.5	http://schemas.usgin.org/schemas/WellHeaderTemplate1.5.xsd
Wellheader 1.7	http://schemas.usgin.org/schemas/WellHeaderTemplate1.7.xsd
WellLog 0.8	http://schemas.usgin.org/schemas/WellLog0.8.xsd

Table 3: Hyperlinks to XML representations of AASG Geothermal Data schemas, listed by schema; entries highlighted in red represent schemas that have not yet been deployed; entries highlighted in gray represent schemas that are deprecated but remain in use

The fields in Table 3 are as follows:

- **Schema and Version:** The most up-to-date version of the NGDS [schema](#) used to structure the data deployed by the user
- **Link to Schema:** A hyperlink that dereferences to an XML representation of the corresponding schema; these XML representations use the **XML Schema Document (*.xsd)** format

This concludes the NGDS naming conventions tutorial.