

OGC® DOCUMENT:

External identifier of this OGC® document: <http://www.opengis.net/doc/spec/ogcapi-edr-3/1.0>



Open
Geospatial
Consortium

OGC API-ENVIRONMENTAL DATA RETRIEVAL V1.2 PART 3 - NWS VIZ APPLICATION PROFILE

BEST PRACTICE
General

DRAFT

Version: 1.0

Submission Date:

Approval Date:

Publication Date:

Editor: Shane Mill (NOAA)

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ABSTRACT

The aim of the NWSViz profile service profile is to provide a standard interface for accessing NWSViz profile data based on OGC API-EDR standard.



KEYWORDS

The following are keywords to be used by search engines and document catalogues.

ogcdoc, OGC document, API, openapi, html, profile



PREFACE

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SECURITY CONSIDERATIONS

No security considerations have been made for this Service Profile.



SUBMITTING ORGANIZATIONS

The following organizations submitted this Document to the Open Geospatial Consortium (OGC):

- Open Geospatial Consortium



SUBMITTERS

All questions regarding this submission should be directed to the editor or the submitters:

Shane Mill

NOAA



CONTRIBUTORS

Additional contributors to this Profile include the following:

Individual name(s), Organization



PREFACE





PREFACE

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1

SCOPE



SCOPE

NOTE: This document defines the NWSViz profile Profile of the OGC API-EDR Part 1: Core Standard.



2

CONFORMANCE

Conformance to the NWSViz profile Profile (this document) can be tested by inspection. The test suite is provided in Annex A.

This Standard contains normative language and thus places requirements on conformance, or mechanism for adoption, of candidate standards to which this Standard applies. In particular:

- OGC API-EDR Requirements Class: Core specifies the core requirements which shall be met by all standards claiming conformance to this Standard.
- OGC API-EDR Part 3 Service Profiles Requirements Class specifies the requirements to which this profile has been defined.



3

NORMATIVE REFERENCES

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO: ISO 19106, *Geographic information – Profiles*. International Organization for Standardization, Geneva <https://www.iso.org/standard/26011.html>.

Mark Burgoyne, Dave Blodgett, Chuck Heazel, Chris Little: OGC 19-086r4, *OGC API – Environmental Data Retrieval Standard*. Open Geospatial Consortium (2021). <http://www.opengis.net/doc/IS/ogcapi-edr-1/1.0.0>.

<https://docs.ogc.org/is/17-069r4/17-069r4.html>, OGC APIFeatures – Part 1: Core, Open Geospatial Consortium (2022).

<https://docs.ogc.org/is/19-072/19-072.html>, OGC API – Common – Part 1: Core, Open Geospatial Consortium (2023).

<http://docs.ogc.org/DRAFTS/20-024.html>, OGC API – Common – Part 2: Geospatial Data (Draft), Open Geospatial Consortium

Policy SWG: OGC 08-131r3, *The Specification Model – Standard for Modular specifications*. Open Geospatial Consortium (2009). https://portal.ogc.org/files/?artifact_id=34762&version=2.

OpenAPI Initiative (OAI). **OpenAPI Specification 3.0** [online]. 2024 [viewed 2025-01-03]. The latest patch version at the time of publication of this standard was 3.0.4, available at <https://spec.openapis.org/oas/v3.0.4>

OpenAPI Initiative (OAI). **OpenAPI Specification 3.1** [online]. 2024 [viewed 2025-01-03]. The latest patch version at the time of publication of this standard was 3.1.1, available at <https://spec.openapis.org/oas/v3.1.1>

The background of the page is a solid dark blue. It features several thin, light yellow lines that intersect to form a network of triangles and polygons. At each of these intersection points, there is a small, solid yellow circle. The overall effect is a subtle, abstract geometric pattern.

4

TERMS AND DEFINITIONS

This document uses the terms defined in [OGC Policy Directive 49](#), which is based on the ISO/IEC Directives, Part 2, Rules for the structure and drafting of International Standards. In particular, the word “shall” (not “must”) is the verb form used to indicate a requirement to be strictly followed to conform to this document and OGC documents do not use the equivalent phrases in the ISO/IEC Directives, Part 2.

This document also uses terms defined in the OGC Standard for Modular specifications (OGC 08-131r3), also known as the ‘ModSpec’. The definitions of terms such as standard, specification, requirement, and conformance test are provided in the ModSpec.

For the purposes of this document, the following additional terms and definitions apply.

4.1. Collection

Body of resources that belong or are used together. An aggregate, set, or group of related resources.

[SOURCE: OGC 20-024]

4.2. Conformance Module; Conformance Test Module

A set of related conformance classes and their associated components.

Note 1 to entry: When no ambiguity is possible, the word test may be omitted. i.e. conformance test module is the same as conformance module. Conformance modules may be nested in a hierarchical way.

[SOURCE: OGC 08-131r5]

4.3. Conformance Class; Conformance Test Class

A set of conformance tests that must be passed to receive a single certificate of conformance.

Note 1 to entry: When no ambiguity is possible, the word *test* may be left out, so conformance test class maybe called a conformance class.

[SOURCE: OGC 08-131r5]

4.4. Conformance Test

A test, abstract or real, of one or more requirements contained within a standard, or set of standards.

[SOURCE: OGC 08-131r5]

4.5. Requirement

Expression in the content of a standard conveying criteria to be fulfilled if compliance with the standard is to be claimed and from which no deviation is permitted.

[SOURCE: OGC 08-131r5]

4.6. Requirements Class

An aggregate of requirements with a single standardization target type that must all be satisfied to pass a conformance test Class.

[SOURCE: OGC 08-131r5]

4.7. Requirements Module

A set of related requirement classes and their associated components.

[SOURCE: OGC 08-131r5]

4.8. Standardization Goal

A concise statement of the problem that the standard helps address and the strategy envisioned for achieving a solution. This strategy typically identifies real-world entities that need to be modified or constrained. At the abstract level, those entities are the Standardization Target Types.

[SOURCE: OGC 08-131r5]

4.9. Standardization Target

Entity to which some requirements of a standard apply.

Note 1 to entry: The standardization target is the entity which may receive a certificate of conformance for a requirements class.

[SOURCE: OGC 08-131r5]

4.10. Standardization Target Type

Type of entity or set of entities to which the requirements of a standard apply

Note 1 to entry: For example, the standardization target type for The OGC API – Features Standard are Web APIs. The standardization target type for the CDB Standard is “datastore”. It is important to understand that a standard’s root standardization target type can have sub-types, and that there can be a hierarchy of target types. For example, a Web API can have sub types of client, server, security, and so forth. As such, each requirements class can have a standardization target type that is a sub-type of the root.

[SOURCE: OGC 08-131r5]



5

CONVENTIONS

This section provides details and examples for any conventions used in the document. Examples of conventions are symbols, abbreviations, use of XML schema, or special notes regarding how to read the document.

5.1. Identifiers

The normative provisions in this standard are denoted by the URI

<http://www.opengis.net/doc/spec/ogcapi-edr-3/1.0>

All requirements and conformance tests that appear in this document are denoted by partial URIs which are relative to this base.

5.1.1. Shortcuts

In the interest of readability, the following terms will be used as shorthand for more complex text:

- **Profile:** A Profile is a standard or specification which restricts and/or extends an existing standard. This standard defines the rules for creating a profile of the OGC API-Environmental Data Retrieval Standard. The term “Profile” will be used in this document as shorthand for “profile of the OGC API-Environmental Data Retrieval Standard”.
- **OGC API-EDR:** The term OGC API-EDR will be used in this document as shorthand for the term “OGC API-Environmental Data Retrieval Standard”



6

CONTEXT

6.1. Standardization Goal

The goal of this profile is to ensure interoperability between NWSViz profile data implementations of the OGC API-Environmental Data Retrieval Standard (OGC API-EDR).

The OGC API-EDR Standard does not try to address every possible application domain. Rather, it provides a foundation which can be tailored for a specific domain. The result of this tailoring is a domain specific “profile” of the OGC API-EDR Standard.

7

REQUIREMENTS CLASS CORE

REQUIREMENTS CLASS 1: REQUIREMENTS CLASS 'NWSVIZ APPLICATION'

IDENTIFIER	<code>http://www.example.org/1.0/req/req-class-nwsviz-application</code>
CONFORMANCE CLASS	Conformance class A.1: <code>http://www.example.org/1.0/conf-class-nwsviz-application</code>
TARGET-TYPE	NWSViz Application Profile Standard
NORMATIVE STATEMENTS	<p>Requirement 1: <code>/req/nwsviz-application/edr-conformant</code></p> <p>Requirement 1-3: <code>/req/nwsviz-application/parameter-names</code></p> <p>Requirement 1-8: <code>/req/nwsviz-application/data-query-position</code></p> <p>Requirement 1-9: <code>/req/nwsviz-application/data-query-radius</code></p> <p>Requirement 1-10: <code>/req/nwsviz-application/data-query-area</code></p> <p>Requirement 1-11: <code>/req/nwsviz-application/data-query-corridor</code></p> <p>Requirement 1-13: <code>/req/nwsviz-application-data/data-query-instances</code></p> <p>Requirement 2: <code>/req/nwsviz-application_data/root</code></p> <p>Requirement 3: <code>/req/nwsviz-application/collectionid</code></p> <p>Requirement 4: <code>/req/nwsviz-application/extent</code></p> <p>Requirement 10: <code>/req/nwsviz-application/data-query</code></p> <p>Requirement 11: <code>/req/nwsviz-application/output-format</code></p> <p>Requirement 13: <code>/req/nwsviz-application/data-query-cube</code></p> <p>Requirement 16: <code>/req/nwsviz-application/status-codes</code></p> <p>Requirement 17: <code>/req/nwsviz-application/msg-bodies</code></p> <p>Requirement 18: <code>/req/nwsviz-application/links</code></p>

7.1. Profiling Requirements

Implementations of the Profile are conformant with OGC API-EDR Part 1

REQUIREMENT 1

IDENTIFIER	<code>/req/nwsviz-application/edr-conformant</code>
INCLUDED IN	Requirements class 1: <code>http://www.example.org/1.0/req/req-class-nwsviz-application</code>

REQUIREMENT 1

STATEMENT The service *SHALL* be compliant with OGC API-Environmental Data Retrieval core v1.2.

7.2. Platform Resources

OGC API — Common defines a set of common capabilities which are applicable to any OGC Web API. Those capabilities provide the platform upon which resource-specific APIs can be built. This section describes those capabilities and any modifications needed to better support spatio-temporal data resources.

Table 1 — Platform Resource Paths

PATH TEMPLATE	METHOD	RESOURCE
{root}/	GET	Landing page
{root}/api	GET	API Description (optional)
{root}/conformance	GET	Conformance Classes

Where: {root} = Base URI for the API server

7.2.1. API Landing Page

Path = {root}/

Dependencies

- OGC API — Common — Part 1: Core
- OGC API-Environmental Data Retrieval Standard — Part 1.2: Core
- OGC API-Environmental Data Retrieval Standard — Part 3 Service Profiles

The landing page provides links that support exploration of the resources offered via the API. The most important component of a landing page is a list of links. The Landing Page resource is initially defined in the Core conformance class of the OGC API — Common — Part 1 Standard. The OGC API-Environmental Data Retrieval Standard does not make any changes to this definition.

The normative JSON Schema for an OGC API-EDR Landing Page is defined in the [LandingPage.yaml](#) document. While this schema provides a rich body of information about the API, only the Links property is required.

Profiles of the OGC API-Environmental Data Retrieval Standard are expected to provide a richer description of the API. The additional content that Profiles should mandate is defined in the following requirements.

REQUIREMENT 2

IDENTIFIER /req/nwsviz-application_data/root

INCLUDED IN Requirements class 1: <http://www.example.org/1.0/req/req-class-nwsviz-application>

STATEMENT The landing page *SHALL* have the following information

A The **Title** property value *SHALL* be “OGC API – Environmental Data Retrieval for Dynamic Ensemble Scenarios for IDSS”

B The **Description** property value *SHALL* be “Implementation of Pygeoapi for OGC API – EDR to support DESI”

C The **Links** property *SHALL* define the links that *SHALL* be included in the Root response and *SHALL* be populated with href and rel properties.

D The **provider** property *SHALL* be included in the Root response and *SHALL* be populated with name and url properties.

E The **contact** property *SHALL* be included in the Root response and *SHALL* be populated with an email property

F The **Links** property *SHALL* include the following link to the OpenAPI definition of the profile:

STATEMENT

```
{
  "title": "OpenAPI definition of NWSViz Application profile",
  "href": "https://www.example.org/edr/profile/nwsviz/openapi.json",
  "rel": "profile",
  "type": "application/json"
}
```

7.2.2. API Definition

Path = {root}/api

Dependencies

- OGC API – Common – Part 1: Core
- OGC API-Environmental Data Retrieval Standard

Every API is required to provide a definition document that describes the capabilities of that API. This definition document can be used by developers to understand the API, by software clients to connect to the server, or by development tools to support the implementation of servers and clients. The API Definition resource is initially defined in the Core conformance class of the OGC API – Common – Part 1 Standard. The OGC API-Environmental Data Retrieval Standard does not make any changes to this definition.

NOTE: At this time only OpenAPI 3.0 and OpenAPI 3.1 documents are supported by OGC Web API Standards.

Profiles of the OGC API-Environmental Data Retrieval Standard are required to provide an OpenAPI 3.1 document. This document extends the API definition provided by the OGC API-EDR Standard. These extensions reflect the additional requirements added by the Profile. Implementors of the profile will then build on that document to produce the API definition document for their implementation.

7.2.3. Declaration of Conformance Classes

Path = {root}/conformance

Dependencies

- OGC API – Common – Part 1: Core
- OGC API-Environmental Data Retrieval Standard
- OGC API-Environmental Data Retrieval Standard – Part 3 Service Profiles

To support “generic” clients that want to access implementations of multiple OGC API Standards and extensions – and not “just” a specific API server, the API has to declare the conformance classes it claims to have implemented. The Conformance Classes resource is initially defined in the Core conformance class of the OGC API – Common – Part 1 Standard. The OGC API-Environmental Data Retrieval Standard Standard does not make any changes to this definition.

Profiles of the OGC API-Environmental Data Retrieval Standard have additional requirements governing which Conformance Classes and identifiers must be included in this resource.

NOTE 1: OpenAPI 3.0 and OpenAPI 3.1 are two distinct Conformance Classes in the OGC API-EDR Standard. This requirement can be addressed in a Profile by including the appropriate conformance classes at {root}/conformance.

NOTE 2: Get guidance from the OGC Naming Authority on valid URIs for Profiles.

7.3. Spatio-temporal and Information Resources

Table 2 — Spatial-temporal and Information Resource Paths

PATH TEMPLATE	METHOD	RESOURCE
{root}/collections	GET	Metadata describing the Collections of data available from this API.
{root}/collections/ {collectionId}	GET	Metadata describing the Collection of data which has the unique identifier {collectionId}

Where:

- {root} = Base URI for the API server
- {collectionId} = an identifier for a specific Collection of data

7.3.1. Collections

OGC API implementations typically organize their geospatial resources into Collections. Information about those is accessed through the /collections path and the <http://www.opengis.net/def/rel/ogc/1.0/data> link relation.

Path = {root}/collections

Dependencies

- OGC API — Common — Part 2: Geospatial Data
- OGC API-Environmental Data Retrieval Standard

The Collections resource is initially defined in the Collections conformance class of the OGC API — Common — Part 2 Standard. The OGC API-Environmental Data Retrieval Standard does not make any changes to this definition.

7.3.2. Collection Description

Each resource Collection is described by a set of metadata. That metadata can be accessed directly using the /collections/{collectionId} path and as an entry in the Collections property of the /collections response.

Path:

- {root}/collections (returns metadata for every Collection)
- {root}/collections/{collectionId} (returns metadata for the specified Collection)

Dependencies

- OGC API — Common — Part 2: Geospatial Data
- OGC API-Environmental Data Retrieval Standard

7.3.2.1. Collection ID restrictions

REQUIREMENT 3		
IDENTIFIER	/req/nwsviz-application/collectionid	
INCLUDED IN	Requirements class 1: http://www.example.org/1.0/req/req-class-nwsviz-application	
STATEMENT	A Collection id should identify the source and type of NWP model	
A	The Collection Ids <i>SHALL</i> contain the following attributes	
STATEMENT	id	description
	HREF	High Resolution Ensemble Forecast
	NBM	National Blend of Models
	LREF	Long Range Ensemble Forecast
	LREF_TLE	Long Range Ensemble Forecast Tile-Lagged Ensemble
	MRMS	Multi-Radar/Multi-Sensor Radar Products

7.3.2.2. Extent property restrictions

The Collection metadata includes an Extent property which defines a spatial-temporal envelope that encompasses the geospatial data in the Collection.

REQUIREMENT 4		
IDENTIFIER	/req/nwsviz-application/extent	
INCLUDED IN	Requirements class 1: http://www.example.org/1.0/req/req-class-nwsviz-application	

REQUIREMENT 4

STATEMENT The Collection *SHALL* have minimum spatial bounds

- | | |
|----------|--|
| A | The Profile <i>SHALL</i> have a spatial extent and contain an additional attribute named "locations" containing the a list of the available locations within the collection. |
| B | The Profile <i>SHALL</i> have a temporal extent containing an interval and values. |
| C | The Profile <i>SHALL</i> contain an attribute named instances which contains a list of available instances for the collection. |
| D | The Profiles <i>SHALL</i> contain a custom query dimension with the name "ensemble" containing values and ids. |
| E | The Profile <i>SHOULD</i> have a vertical extent if applicable |

7.3.2.3. Parameter_names property restrictions

The Collection metadata includes an Parameter_names property which defines the data parameters that are available in the Collection

REQUIREMENT 5

IDENTIFIER /req/nwsviz-application/HREF-parameter-names

STATEMENT The HREF Collection *SHALL* have a defined list of parameter_names

A A HREF Collection *SHALL* have the following parameter_names definition

STATEMENT	<pre>{ "parameter-names":{ "apcp_1h":{ "Type":"Parameter", "id":"apcp_1h", "description":"apcp_1h" }, "apcp_2h":{ "Type":"Parameter", "id":"apcp_2h", "description":"apcp_2h" }, "apcp_3h":{ "Type":"Parameter", "id":"apcp_3h", "description":"apcp_3h" }, "apcp_accum":{ "Type":"Parameter", "id":"apcp_accum", "description":"apcp_accum" }, "apcp_accum-lpmm":{ "Type":"Parameter",</pre>
------------------	---

REQUIREMENT 5

```
      "id": "apcp_accum-lpmm",
      "description": "apcp_accum-lpmm"
    },
    "apcp_accum_24h": {
      "Type": "Parameter",
      "id": "apcp_accum_24h",
      "description": "apcp_accum_24h"
    },
    "apcp_accum_24h-lpmm": {
      "Type": "Parameter",
      "id": "apcp_accum_24h-lpmm",
      "description": "apcp_accum_24h-lpmm"
    },
    "apcp_accum_6h": {
      "Type": "Parameter",
      "id": "apcp_accum_6h",
      "description": "apcp_accum_6h"
    },
    "apcp_accum_6h-lpmm": {
      "Type": "Parameter",
      "id": "apcp_accum_6h-lpmm",
      "description": "apcp_accum_6h-lpmm"
    },
    "cape": {
      "Type": "Parameter",
      "id": "cape",
      "description": "cape"
    },
    "ceil": {
      "Type": "Parameter",
      "id": "ceil",
      "description": "ceil"
    },
    "ceilingAGL": {
      "Type": "Parameter",
      "id": "ceilingAGL",
      "description": "ceilingAGL"
    },
    "cfrzr": {
      "Type": "Parameter",
      "id": "cfrzr",
      "description": "cfrzr"
    },
    "cicep": {
      "Type": "Parameter",
      "id": "cicep",
      "description": "cicep"
    },
    "cin": {
      "Type": "Parameter",
      "id": "cin",
      "description": "cin"
    },
    "colmd": {
      "Type": "Parameter",
      "id": "colmd",
      "description": "colmd"
    },
    "crain": {
      "Type": "Parameter",
      "id": "crain",
      "description": "crain"
    },
    "csnow": {
      "Type": "Parameter",
      "id": "csnow",
      "description": "csnow"
    }
  }
```

REQUIREMENT 5

```
    },
    "d2m":{
      "Type":"Parameter",
      "id":"d2m",
      "description":"d2m"
    },
    "dpt_isobaric":{
      "Type":"Parameter",
      "id":"dpt_isobaric",
      "description":"dpt_isobaric"
    },
    "dswrf":{
      "Type":"Parameter",
      "id":"dswrf",
      "description":"dswrf"
    },
    "ensemble":{
      "Type":"Parameter",
      "id":"ensemble",
      "description":"ensemble"
    },
    "fram1":{
      "Type":"Parameter",
      "id":"fram1",
      "description":"fram1"
    },
    "fram24":{
      "Type":"Parameter",
      "id":"fram24",
      "description":"fram24"
    },
    "fram24-lpmm":{
      "Type":"Parameter",
      "id":"fram24-lpmm",
      "description":"fram24-lpmm"
    },
    "fram6":{
      "Type":"Parameter",
      "id":"fram6",
      "description":"fram6"
    },
    "fram6-lpmm":{
      "Type":"Parameter",
      "id":"fram6-lpmm",
      "description":"fram6-lpmm"
    },
    "framtotal":{
      "Type":"Parameter",
      "id":"framtotal",
      "description":"framtotal"
    },
    "front700":{
      "Type":"Parameter",
      "id":"front700",
      "description":"front700"
    },
    "front850":{
      "Type":"Parameter",
      "id":"front850",
      "description":"front850"
    },
    "frzr1":{
      "Type":"Parameter",
      "id":"frzr1",
      "description":"frzr1"
    },
    "frzr24":{
```

REQUIREMENT 5

```
      "Type": "Parameter",
      "id": "frzr24",
      "description": "frzr24"
    },
    "frzr24-lpmm": {
      "Type": "Parameter",
      "id": "frzr24-lpmm",
      "description": "frzr24-lpmm"
    },
    "frzr6": {
      "Type": "Parameter",
      "id": "frzr6",
      "description": "frzr6"
    },
    "frzr6-lpmm": {
      "Type": "Parameter",
      "id": "frzr6-lpmm",
      "description": "frzr6-lpmm"
    },
    "frzrtotal": {
      "Type": "Parameter",
      "id": "frzrtotal",
      "description": "frzrtotal"
    },
    "gh1000-gh500": {
      "Type": "Parameter",
      "id": "gh1000-gh500",
      "description": "gh1000-gh500"
    },
    "gh700-gh500_lr": {
      "Type": "Parameter",
      "id": "gh700-gh500_lr",
      "description": "gh700-gh500_lr"
    },
    "gh_isobaric": {
      "Type": "Parameter",
      "id": "gh_isobaric",
      "description": "gh_isobaric"
    },
    "gust": {
      "Type": "Parameter",
      "id": "gust",
      "description": "gust"
    },
    "hcc": {
      "Type": "Parameter",
      "id": "hcc",
      "description": "hcc"
    },
    "hlcy_1000": {
      "Type": "Parameter",
      "id": "hlcy_1000",
      "description": "hlcy_1000"
    },
    "hlcy_3000": {
      "Type": "Parameter",
      "id": "hlcy_3000",
      "description": "hlcy_3000"
    },
    "inventory": {
      "Type": "Parameter",
      "id": "inventory",
      "description": "inventory"
    },
    "isobaricInhPa": {
      "Type": "Parameter",
      "id": "isobaricInhPa",
```

REQUIREMENT 5

```
    "description": "isobaricInhPa"
  },
  "large-fire-potential": {
    "Type": "Parameter",
    "id": "large-fire-potential",
    "description": "large-fire-potential"
  },
  "latitude": {
    "Type": "Parameter",
    "id": "latitude",
    "description": "latitude"
  },
  "lcc": {
    "Type": "Parameter",
    "id": "lcc",
    "description": "lcc"
  },
  "lcl": {
    "Type": "Parameter",
    "id": "lcl",
    "description": "lcl"
  },
  "longitude": {
    "Type": "Parameter",
    "id": "longitude",
    "description": "longitude"
  },
  "ltng": {
    "Type": "Parameter",
    "id": "ltng",
    "description": "ltng"
  },
  "massden": {
    "Type": "Parameter",
    "id": "massden",
    "description": "massden"
  },
  "mcc": {
    "Type": "Parameter",
    "id": "mcc",
    "description": "mcc"
  },
  "mnuphl_3000": {
    "Type": "Parameter",
    "id": "mnuphl_3000",
    "description": "mnuphl_3000"
  },
  "mnuphl_5000": {
    "Type": "Parameter",
    "id": "mnuphl_5000",
    "description": "mnuphl_5000"
  },
  "mxuphl_3000": {
    "Type": "Parameter",
    "id": "mxuphl_3000",
    "description": "mxuphl_3000"
  },
  "mxuphl_5000": {
    "Type": "Parameter",
    "id": "mxuphl_5000",
    "description": "mxuphl_5000"
  },
  "names": {
    "Type": "Parameter",
    "id": "names",
    "description": "names"
  },
}
```

REQUIREMENT 5

```
"orog":{
  "Type":"Parameter",
  "id":"orog",
  "description":"orog"
},
"pfrzr":{
  "Type":"Parameter",
  "id":"pfrzr",
  "description":"pfrzr"
},
"picep":{
  "Type":"Parameter",
  "id":"picep",
  "description":"picep"
},
"prain":{
  "Type":"Parameter",
  "id":"prain",
  "description":"prain"
},
"prmsl":{
  "Type":"Parameter",
  "id":"prmsl",
  "description":"prmsl"
},
"psnow":{
  "Type":"Parameter",
  "id":"psnow",
  "description":"psnow"
},
"pwat":{
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  "id":"pwat",
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},
"r2":{
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  "id":"r2",
  "description":"r2"
},
"r_isobaric":{
  "Type":"Parameter",
  "id":"r_isobaric",
  "description":"r_isobaric"
},
"refc":{
  "Type":"Parameter",
  "id":"refc",
  "description":"refc"
},
"refc-lpmm":{
  "Type":"Parameter",
  "id":"refc-lpmm",
  "description":"refc-lpmm"
},
"reference_time":{
  "Type":"Parameter",
  "id":"reference_time",
  "description":"reference_time"
},
"retop":{
  "Type":"Parameter",
  "id":"retop",
  "description":"retop"
},
"sdwe_1h":{
  "Type":"Parameter",
```

REQUIREMENT 5

```
      "id": "sdwe_1h",
      "description": "sdwe_1h"
    },
    "sdwe_2h": {
      "Type": "Parameter",
      "id": "sdwe_2h",
      "description": "sdwe_2h"
    },
    "sdwe_3h": {
      "Type": "Parameter",
      "id": "sdwe_3h",
      "description": "sdwe_3h"
    },
    "sdwe_accum": {
      "Type": "Parameter",
      "id": "sdwe_accum",
      "description": "sdwe_accum"
    },
    "sdwe_accum-lpmm": {
      "Type": "Parameter",
      "id": "sdwe_accum-lpmm",
      "description": "sdwe_accum-lpmm"
    },
    "sdwe_accum_1h": {
      "Type": "Parameter",
      "id": "sdwe_accum_1h",
      "description": "sdwe_accum_1h"
    },
    "sdwe_accum_24h": {
      "Type": "Parameter",
      "id": "sdwe_accum_24h",
      "description": "sdwe_accum_24h"
    },
    "sdwe_accum_24h-lpmm": {
      "Type": "Parameter",
      "id": "sdwe_accum_24h-lpmm",
      "description": "sdwe_accum_24h-lpmm"
    },
    "sdwe_accum_6h": {
      "Type": "Parameter",
      "id": "sdwe_accum_6h",
      "description": "sdwe_accum_6h"
    },
    "sdwe_accum_6h-lpmm": {
      "Type": "Parameter",
      "id": "sdwe_accum_6h-lpmm",
      "description": "sdwe_accum_6h-lpmm"
    },
    "sp": {
      "Type": "Parameter",
      "id": "sp",
      "description": "sp"
    },
    "stp": {
      "Type": "Parameter",
      "id": "stp",
      "description": "stp"
    },
    "t2m": {
      "Type": "Parameter",
      "id": "t2m",
      "description": "t2m"
    },
    "t_isobaric": {
      "Type": "Parameter",
      "id": "t_isobaric",
      "description": "t_isobaric"
    }
```

REQUIREMENT 5

```
    },
    "ta2":{
      "Type":"Parameter",
      "id":"ta2",
      "description":"ta2"
    },
    "tadv700":{
      "Type":"Parameter",
      "id":"tadv700",
      "description":"tadv700"
    },
    "tadv850":{
      "Type":"Parameter",
      "id":"tadv850",
      "description":"tadv850"
    },
    "tcdc":{
      "Type":"Parameter",
      "id":"tcdc",
      "description":"tcdc"
    },
    "thte2":{
      "Type":"Parameter",
      "id":"thte2",
      "description":"thte2"
    },
    "thte850":{
      "Type":"Parameter",
      "id":"thte850",
      "description":"thte850"
    },
    "thte925":{
      "Type":"Parameter",
      "id":"thte925",
      "description":"thte925"
    },
    "tw2":{
      "Type":"Parameter",
      "id":"tw2",
      "description":"tw2"
    },
    "u10":{
      "Type":"Parameter",
      "id":"u10",
      "description":"u10"
    },
    "u_isobaric":{
      "Type":"Parameter",
      "id":"u_isobaric",
      "description":"u_isobaric"
    },
    "v10":{
      "Type":"Parameter",
      "id":"v10",
      "description":"v10"
    },
    "v_isobaric":{
      "Type":"Parameter",
      "id":"v_isobaric",
      "description":"v_isobaric"
    },
    "vis":{
      "Type":"Parameter",
      "id":"vis",
      "description":"vis"
    },
    "vort500":{
```


REQUIREMENT 5

```
      "Type": "Parameter",
      "id": "vort500",
      "description": "vort500"
    },
    "vucsh": {
      "Type": "Parameter",
      "id": "vucsh",
      "description": "vucsh"
    },
    "vvcsh": {
      "Type": "Parameter",
      "id": "vvcsh",
      "description": "vvcsh"
    },
    "w_isobaric": {
      "Type": "Parameter",
      "id": "w_isobaric",
      "description": "w_isobaric"
    },
    "wd_isobaric": {
      "Type": "Parameter",
      "id": "wd_isobaric",
      "description": "wd_isobaric"
    },
    "wd_isobaric-mean": {
      "Type": "Parameter",
      "id": "wd_isobaric-mean",
      "description": "wd_isobaric-mean"
    },
    "wd_isobaric-std": {
      "Type": "Parameter",
      "id": "wd_isobaric-std",
      "description": "wd_isobaric-std"
    },
    "wdir": {
      "Type": "Parameter",
      "id": "wdir",
      "description": "wdir"
    },
    "wdir-mean": {
      "Type": "Parameter",
      "id": "wdir-mean",
      "description": "wdir-mean"
    },
    "wdir-std": {
      "Type": "Parameter",
      "id": "wdir-std",
      "description": "wdir-std"
    },
    "ws_isobaric": {
      "Type": "Parameter",
      "id": "ws_isobaric",
      "description": "ws_isobaric"
    },
    "wshr0-6km": {
      "Type": "Parameter",
      "id": "wshr0-6km",
      "description": "wshr0-6km"
    },
    "wshrd0-6km": {
      "Type": "Parameter",
      "id": "wshrd0-6km",
      "description": "wshrd0-6km"
    },
    "wshrd0-6km-mean": {
      "Type": "Parameter",
      "id": "wshrd0-6km-mean",
```

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```
        "description": "wshrd0-6km-mean"
      },
      "wshrd0-6km-std": {
        "Type": "Parameter",
        "id": "wshrd0-6km-std",
        "description": "wshrd0-6km-std"
      },
      "wspd": {
        "Type": "Parameter",
        "id": "wspd",
        "description": "wspd"
      }
    }
  }
}
```

REQUIREMENT 6

IDENTIFIER /req/nwsviz-application/NBM-parameter-names

STATEMENT The NBM Collection *SHALL* have a defined list of parameter_names

A A NBM Collection *SHALL* have the following parameter_names definition

STATEMENT

```
{
  "parameter-names": {
    "10si_heightAboveGround": {
      "Type": "Parameter",
      "id": "10si_heightAboveGround",
      "description": "10si_heightAboveGround"
    },
    "10si_heightAboveGround_10%": {
      "Type": "Parameter",
      "id": "10si_heightAboveGround_10%",
      "description": "10si_heightAboveGround_10%"
    },
    "10si_heightAboveGround_25%": {
      "Type": "Parameter",
      "id": "10si_heightAboveGround_25%",
      "description": "10si_heightAboveGround_25%"
    },
    "10si_heightAboveGround_50%": {
      "Type": "Parameter",
      "id": "10si_heightAboveGround_50%",
      "description": "10si_heightAboveGround_50%"
    },
    "10si_heightAboveGround_75%": {
      "Type": "Parameter",
      "id": "10si_heightAboveGround_75%",
      "description": "10si_heightAboveGround_75%"
    },
    "10si_heightAboveGround_90%": {
      "Type": "Parameter",
      "id": "10si_heightAboveGround_90%",
      "description": "10si_heightAboveGround_90%"
    },
    "10si_heightAboveGround_ens_std_dev": {
      "Type": "Parameter",
      "id": "10si_heightAboveGround_ens_std_dev",
      "description": "10si_heightAboveGround_ens_std_dev"
    }
  }
}
```

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```
"10wdir_heightAboveGround":{
  "Type":"Parameter",
  "id":"10wdir_heightAboveGround",
  "description":"10wdir_heightAboveGround"
},
"10wdir_heightAboveGround_50%":{
  "Type":"Parameter",
  "id":"10wdir_heightAboveGround_50%",
  "description":"10wdir_heightAboveGround_50%"
},
"10wdir_heightAboveGround_75%":{
  "Type":"Parameter",
  "id":"10wdir_heightAboveGround_75%",
  "description":"10wdir_heightAboveGround_75%"
},
"10wdir_heightAboveGround_90%":{
  "Type":"Parameter",
  "id":"10wdir_heightAboveGround_90%",
  "description":"10wdir_heightAboveGround_90%"
},
"2d_heightAboveGround":{
  "Type":"Parameter",
  "id":"2d_heightAboveGround",
  "description":"2d_heightAboveGround"
},
"2d_heightAboveGround_ens_std_dev":{
  "Type":"Parameter",
  "id":"2d_heightAboveGround_ens_std_dev",
  "description":"2d_heightAboveGround_ens_std_dev"
},
"2r_heightAboveGround":{
  "Type":"Parameter",
  "id":"2r_heightAboveGround",
  "description":"2r_heightAboveGround"
},
"2t_heightAboveGround":{
  "Type":"Parameter",
  "id":"2t_heightAboveGround",
  "description":"2t_heightAboveGround"
},
"2t_heightAboveGround_50%":{
  "Type":"Parameter",
  "id":"2t_heightAboveGround_50%",
  "description":"2t_heightAboveGround_50%"
},
"2t_heightAboveGround_ens_std_dev":{
  "Type":"Parameter",
  "id":"2t_heightAboveGround_ens_std_dev",
  "description":"2t_heightAboveGround_ens_std_dev"
},
"apcp_surface_12hrs_accum_>0.254":{
  "Type":"Parameter",
  "id":"apcp_surface_12hrs_accum_>0.254",
  "description":"apcp_surface_12hrs_accum_>0.254"
},
"apcp_surface_1hrs_accum":{
  "Type":"Parameter",
  "id":"apcp_surface_1hrs_accum",
  "description":"apcp_surface_1hrs_accum"
},
"apcp_surface_1hrs_accum_>0.254":{
  "Type":"Parameter",
  "id":"apcp_surface_1hrs_accum_>0.254",
  "description":"apcp_surface_1hrs_accum_>0.254"
},
"apcp_surface_6hrs_accum":{
  "Type":"Parameter",
```

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```
      "id": "apcp_surface_6hrs_accum",
      "description": "apcp_surface_6hrs_accum"
    },
    "apcp_surface_6hrs_accum_>0.254": {
      "Type": "Parameter",
      "id": "apcp_surface_6hrs_accum_>0.254",
      "description": "apcp_surface_6hrs_accum_>0.254"
    },
    "aptmp_heightAboveGround_level-2": {
      "Type": "Parameter",
      "id": "aptmp_heightAboveGround_level-2",
      "description": "aptmp_heightAboveGround_level-2"
    },
    "asnow_surface_1hrs_accum": {
      "Type": "Parameter",
      "id": "asnow_surface_1hrs_accum",
      "description": "asnow_surface_1hrs_accum"
    },
    "asnow_surface_1hrs_accum_10%": {
      "Type": "Parameter",
      "id": "asnow_surface_1hrs_accum_10%",
      "description": "asnow_surface_1hrs_accum_10%"
    },
    "asnow_surface_1hrs_accum_25%": {
      "Type": "Parameter",
      "id": "asnow_surface_1hrs_accum_25%",
      "description": "asnow_surface_1hrs_accum_25%"
    },
    "asnow_surface_1hrs_accum_5%": {
      "Type": "Parameter",
      "id": "asnow_surface_1hrs_accum_5%",
      "description": "asnow_surface_1hrs_accum_5%"
    },
    "asnow_surface_1hrs_accum_50%": {
      "Type": "Parameter",
      "id": "asnow_surface_1hrs_accum_50%",
      "description": "asnow_surface_1hrs_accum_50%"
    },
    "asnow_surface_1hrs_accum_75%": {
      "Type": "Parameter",
      "id": "asnow_surface_1hrs_accum_75%",
      "description": "asnow_surface_1hrs_accum_75%"
    },
    "asnow_surface_1hrs_accum_90%": {
      "Type": "Parameter",
      "id": "asnow_surface_1hrs_accum_90%",
      "description": "asnow_surface_1hrs_accum_90%"
    },
    "asnow_surface_1hrs_accum_95%": {
      "Type": "Parameter",
      "id": "asnow_surface_1hrs_accum_95%",
      "description": "asnow_surface_1hrs_accum_95%"
    },
    "asnow_surface_1hrs_accum_>0.00254": {
      "Type": "Parameter",
      "id": "asnow_surface_1hrs_accum_>0.00254",
      "description": "asnow_surface_1hrs_accum_>0.00254"
    },
    "asnow_surface_1hrs_accum_>0.00762": {
      "Type": "Parameter",
      "id": "asnow_surface_1hrs_accum_>0.00762",
      "description": "asnow_surface_1hrs_accum_>0.00762"
    },
    "asnow_surface_1hrs_accum_>0.0127": {
      "Type": "Parameter",
      "id": "asnow_surface_1hrs_accum_>0.0127",
      "description": "asnow_surface_1hrs_accum_>0.0127"
    }
  }
```

REQUIREMENT 6

```
},
"asnow_surface_1hrs_accum_>0.01778":{
  "Type":"Parameter",
  "id":"asnow_surface_1hrs_accum_>0.01778",
  "description":"asnow_surface_1hrs_accum_>0.01778"
},
"asnow_surface_1hrs_accum_>0.0254":{
  "Type":"Parameter",
  "id":"asnow_surface_1hrs_accum_>0.0254",
  "description":"asnow_surface_1hrs_accum_>0.0254"
},
"asnow_surface_1hrs_accum_>0.0381":{
  "Type":"Parameter",
  "id":"asnow_surface_1hrs_accum_>0.0381",
  "description":"asnow_surface_1hrs_accum_>0.0381"
},
"asnow_surface_1hrs_accum_>0.0508":{
  "Type":"Parameter",
  "id":"asnow_surface_1hrs_accum_>0.0508",
  "description":"asnow_surface_1hrs_accum_>0.0508"
},
"asnow_surface_1hrs_accum_>0.0635":{
  "Type":"Parameter",
  "id":"asnow_surface_1hrs_accum_>0.0635",
  "description":"asnow_surface_1hrs_accum_>0.0635"
},
"asnow_surface_1hrs_accum_>0.0762":{
  "Type":"Parameter",
  "id":"asnow_surface_1hrs_accum_>0.0762",
  "description":"asnow_surface_1hrs_accum_>0.0762"
},
"asnow_surface_1hrs_accum_>0.1016":{
  "Type":"Parameter",
  "id":"asnow_surface_1hrs_accum_>0.1016",
  "description":"asnow_surface_1hrs_accum_>0.1016"
},
"asnow_surface_24hrs_accum":{
  "Type":"Parameter",
  "id":"asnow_surface_24hrs_accum",
  "description":"asnow_surface_24hrs_accum"
},
"asnow_surface_24hrs_accum_10%":{
  "Type":"Parameter",
  "id":"asnow_surface_24hrs_accum_10%",
  "description":"asnow_surface_24hrs_accum_10%"
},
"asnow_surface_24hrs_accum_25%":{
  "Type":"Parameter",
  "id":"asnow_surface_24hrs_accum_25%",
  "description":"asnow_surface_24hrs_accum_25%"
},
"asnow_surface_24hrs_accum_5%":{
  "Type":"Parameter",
  "id":"asnow_surface_24hrs_accum_5%",
  "description":"asnow_surface_24hrs_accum_5%"
},
"asnow_surface_24hrs_accum_50%":{
  "Type":"Parameter",
  "id":"asnow_surface_24hrs_accum_50%",
  "description":"asnow_surface_24hrs_accum_50%"
},
"asnow_surface_24hrs_accum_75%":{
  "Type":"Parameter",
  "id":"asnow_surface_24hrs_accum_75%",
  "description":"asnow_surface_24hrs_accum_75%"
},
"asnow_surface_24hrs_accum_90%":{
```

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```
      "Type": "Parameter",
      "id": "asnow_surface_24hrs_accum_90%",
      "description": "asnow_surface_24hrs_accum_90%"
    },
    "asnow_surface_24hrs_accum_95%": {
      "Type": "Parameter",
      "id": "asnow_surface_24hrs_accum_95%",
      "description": "asnow_surface_24hrs_accum_95%"
    },
    "asnow_surface_24hrs_accum_>0.00254": {
      "Type": "Parameter",
      "id": "asnow_surface_24hrs_accum_>0.00254",
      "description": "asnow_surface_24hrs_accum_>0.00254"
    },
    "asnow_surface_24hrs_accum_>0.0254": {
      "Type": "Parameter",
      "id": "asnow_surface_24hrs_accum_>0.0254",
      "description": "asnow_surface_24hrs_accum_>0.0254"
    },
    "asnow_surface_24hrs_accum_>0.0508": {
      "Type": "Parameter",
      "id": "asnow_surface_24hrs_accum_>0.0508",
      "description": "asnow_surface_24hrs_accum_>0.0508"
    },
    "asnow_surface_24hrs_accum_>0.1016": {
      "Type": "Parameter",
      "id": "asnow_surface_24hrs_accum_>0.1016",
      "description": "asnow_surface_24hrs_accum_>0.1016"
    },
    "asnow_surface_24hrs_accum_>0.1524": {
      "Type": "Parameter",
      "id": "asnow_surface_24hrs_accum_>0.1524",
      "description": "asnow_surface_24hrs_accum_>0.1524"
    },
    "asnow_surface_24hrs_accum_>0.2032": {
      "Type": "Parameter",
      "id": "asnow_surface_24hrs_accum_>0.2032",
      "description": "asnow_surface_24hrs_accum_>0.2032"
    },
    "asnow_surface_24hrs_accum_>0.254": {
      "Type": "Parameter",
      "id": "asnow_surface_24hrs_accum_>0.254",
      "description": "asnow_surface_24hrs_accum_>0.254"
    },
    "asnow_surface_24hrs_accum_>0.3048": {
      "Type": "Parameter",
      "id": "asnow_surface_24hrs_accum_>0.3048",
      "description": "asnow_surface_24hrs_accum_>0.3048"
    },
    "asnow_surface_24hrs_accum_>0.4572": {
      "Type": "Parameter",
      "id": "asnow_surface_24hrs_accum_>0.4572",
      "description": "asnow_surface_24hrs_accum_>0.4572"
    },
    "asnow_surface_24hrs_accum_>0.6096": {
      "Type": "Parameter",
      "id": "asnow_surface_24hrs_accum_>0.6096",
      "description": "asnow_surface_24hrs_accum_>0.6096"
    },
    "asnow_surface_48hrs_accum": {
      "Type": "Parameter",
      "id": "asnow_surface_48hrs_accum",
      "description": "asnow_surface_48hrs_accum"
    },
    "asnow_surface_48hrs_accum_10%": {
      "Type": "Parameter",
      "id": "asnow_surface_48hrs_accum_10%",
```

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```
      "description": "asnow_surface_48hrs_accum_10%"
    },
    "asnow_surface_48hrs_accum_25%": {
      "Type": "Parameter",
      "id": "asnow_surface_48hrs_accum_25%",
      "description": "asnow_surface_48hrs_accum_25%"
    },
    "asnow_surface_48hrs_accum_5%": {
      "Type": "Parameter",
      "id": "asnow_surface_48hrs_accum_5%",
      "description": "asnow_surface_48hrs_accum_5%"
    },
    "asnow_surface_48hrs_accum_50%": {
      "Type": "Parameter",
      "id": "asnow_surface_48hrs_accum_50%",
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    },
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      "id": "asnow_surface_48hrs_accum_>0.4572",
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}
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REQUIREMENT 6

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"ficeac_surface_24hrs_accum_>0.254":{
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      "id": "ficeac_surface_24hrs_accum_>25.4",
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      "id": "ficeac_surface_24hrs_accum_>6.35",
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"ficeac_surface_6hrs_accum_>0.254":{
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  "id":"ficeac_surface_6hrs_accum_>0.254",
  "description":"ficeac_surface_6hrs_accum_>0.254"
},
"ficeac_surface_6hrs_accum_>12.7":{
  "Type":"Parameter",
  "id":"ficeac_surface_6hrs_accum_>12.7",
  "description":"ficeac_surface_6hrs_accum_>12.7"
},
"ficeac_surface_6hrs_accum_>2.54":{
```

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```
    "Type": "Parameter",
    "id": "ficeac_surface_6hrs_accum_>2.54",
    "description": "ficeac_surface_6hrs_accum_>2.54"
  },
  "ficeac_surface_6hrs_accum_>25.4": {
    "Type": "Parameter",
    "id": "ficeac_surface_6hrs_accum_>25.4",
    "description": "ficeac_surface_6hrs_accum_>25.4"
  },
  "ficeac_surface_6hrs_accum_>6.35": {
    "Type": "Parameter",
    "id": "ficeac_surface_6hrs_accum_>6.35",
    "description": "ficeac_surface_6hrs_accum_>6.35"
  },
  "ficeac_surface_72hrs_accum": {
    "Type": "Parameter",
    "id": "ficeac_surface_72hrs_accum",
    "description": "ficeac_surface_72hrs_accum"
  },
  "ficeac_surface_72hrs_accum_10%": {
    "Type": "Parameter",
    "id": "ficeac_surface_72hrs_accum_10%",
    "description": "ficeac_surface_72hrs_accum_10%"
  },
  "ficeac_surface_72hrs_accum_25%": {
    "Type": "Parameter",
    "id": "ficeac_surface_72hrs_accum_25%",
    "description": "ficeac_surface_72hrs_accum_25%"
  },
  "ficeac_surface_72hrs_accum_5%": {
    "Type": "Parameter",
    "id": "ficeac_surface_72hrs_accum_5%",
    "description": "ficeac_surface_72hrs_accum_5%"
  },
  "ficeac_surface_72hrs_accum_50%": {
    "Type": "Parameter",
    "id": "ficeac_surface_72hrs_accum_50%",
    "description": "ficeac_surface_72hrs_accum_50%"
  },
  "ficeac_surface_72hrs_accum_75%": {
    "Type": "Parameter",
    "id": "ficeac_surface_72hrs_accum_75%",
    "description": "ficeac_surface_72hrs_accum_75%"
  },
  "ficeac_surface_72hrs_accum_90%": {
    "Type": "Parameter",
    "id": "ficeac_surface_72hrs_accum_90%",
    "description": "ficeac_surface_72hrs_accum_90%"
  },
  "ficeac_surface_72hrs_accum_95%": {
    "Type": "Parameter",
    "id": "ficeac_surface_72hrs_accum_95%",
    "description": "ficeac_surface_72hrs_accum_95%"
  },
  "ficeac_surface_72hrs_accum_>0.254": {
    "Type": "Parameter",
    "id": "ficeac_surface_72hrs_accum_>0.254",
    "description": "ficeac_surface_72hrs_accum_>0.254"
  },
  "ficeac_surface_72hrs_accum_>12.7": {
    "Type": "Parameter",
    "id": "ficeac_surface_72hrs_accum_>12.7",
    "description": "ficeac_surface_72hrs_accum_>12.7"
  },
  "ficeac_surface_72hrs_accum_>2.54": {
    "Type": "Parameter",
    "id": "ficeac_surface_72hrs_accum_>2.54",
```


REQUIREMENT 6

```
      "description": "ficeac_surface_72hrs_accum_>2.54"
    },
    "ficeac_surface_72hrs_accum_>25.4": {
      "Type": "Parameter",
      "id": "ficeac_surface_72hrs_accum_>25.4",
      "description": "ficeac_surface_72hrs_accum_>25.4"
    },
    "ficeac_surface_72hrs_accum_>6.35": {
      "Type": "Parameter",
      "id": "ficeac_surface_72hrs_accum_>6.35",
      "description": "ficeac_surface_72hrs_accum_>6.35"
    },
    "fosindx_surface_level-2_6hrs_max": {
      "Type": "Parameter",
      "id": "fosindx_surface_level-2_6hrs_max",
      "description": "fosindx_surface_level-2_6hrs_max"
    },
    "frzspr_surface": {
      "Type": "Parameter",
      "id": "frzspr_surface",
      "description": "frzspr_surface"
    },
    "h_surface_levels_0-610": {
      "Type": "Parameter",
      "id": "h_surface_levels_0-610",
      "description": "h_surface_levels_0-610"
    },
    "hindex_atmosphereSingleLayer_6hrs_max": {
      "Type": "Parameter",
      "id": "hindex_atmosphereSingleLayer_6hrs_max",
      "description": "hindex_atmosphereSingleLayer_6hrs_max"
    },
    "i10fg_heightAboveGround": {
      "Type": "Parameter",
      "id": "i10fg_heightAboveGround",
      "description": "i10fg_heightAboveGround"
    },
    "i10fg_heightAboveGround_50%": {
      "Type": "Parameter",
      "id": "i10fg_heightAboveGround_50%",
      "description": "i10fg_heightAboveGround_50%"
    },
    "i10fg_heightAboveGround_ens_std_dev": {
      "Type": "Parameter",
      "id": "i10fg_heightAboveGround_ens_std_dev",
      "description": "i10fg_heightAboveGround_ens_std_dev"
    },
    "inventory": {
      "Type": "Parameter",
      "id": "inventory",
      "description": "inventory"
    },
    "latitude": {
      "Type": "Parameter",
      "id": "latitude",
      "description": "latitude"
    },
    "longitude": {
      "Type": "Parameter",
      "id": "longitude",
      "description": "longitude"
    },
    "maxref_heightAboveGround_level-1000_1hrs_max": {
      "Type": "Parameter",
      "id": "maxref_heightAboveGround_level-1000_1hrs_max",
      "description": "maxref_heightAboveGround_level-1000_1hrs_max"
    },
  },
```

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```
"maxrh_heightAboveGround_level-2_12hrs_max":{
  "Type":"Parameter",
  "id":"maxrh_heightAboveGround_level-2_12hrs_max",
  "description":"maxrh_heightAboveGround_level-2_12hrs_max"
},
"minrh_heightAboveGround_level-2_12hrs_min":{
  "Type":"Parameter",
  "id":"minrh_heightAboveGround_level-2_12hrs_min",
  "description":"minrh_heightAboveGround_level-2_12hrs_min"
},
"mld_atmosphereSingleLayer":{
  "Type":"Parameter",
  "id":"mld_atmosphereSingleLayer",
  "description":"mld_atmosphereSingleLayer"
},
"pcpdur_surface_12hrs_accum":{
  "Type":"Parameter",
  "id":"pcpdur_surface_12hrs_accum",
  "description":"pcpdur_surface_12hrs_accum"
},
"prmsl_meanSea_10%":{
  "Type":"Parameter",
  "id":"prmsl_meanSea_10%",
  "description":"prmsl_meanSea_10%"
},
"prmsl_meanSea_25%":{
  "Type":"Parameter",
  "id":"prmsl_meanSea_25%",
  "description":"prmsl_meanSea_25%"
},
"prmsl_meanSea_50%":{
  "Type":"Parameter",
  "id":"prmsl_meanSea_50%",
  "description":"prmsl_meanSea_50%"
},
"prmsl_meanSea_75%":{
  "Type":"Parameter",
  "id":"prmsl_meanSea_75%",
  "description":"prmsl_meanSea_75%"
},
"prmsl_meanSea_90%":{
  "Type":"Parameter",
  "id":"prmsl_meanSea_90%",
  "description":"prmsl_meanSea_90%"
},
"ptype_surface_2.0t1.0":{
  "Type":"Parameter",
  "id":"ptype_surface_2.0t1.0",
  "description":"ptype_surface_2.0t1.0"
},
"ptype_surface_4.0t3.0":{
  "Type":"Parameter",
  "id":"ptype_surface_4.0t3.0",
  "description":"ptype_surface_4.0t3.0"
},
"ptype_surface_7.0t5.0":{
  "Type":"Parameter",
  "id":"ptype_surface_7.0t5.0",
  "description":"ptype_surface_7.0t5.0"
},
"ptype_surface_9.0t8.0":{
  "Type":"Parameter",
  "id":"ptype_surface_9.0t8.0",
  "description":"ptype_surface_9.0t8.0"
},
"pwther_surface":{
  "Type":"Parameter",
```

REQUIREMENT 6

```
      "id": "pwther_surface",
      "description": "pwther_surface"
    },
    "reference_time": {
      "Type": "Parameter",
      "id": "reference_time",
      "description": "reference_time"
    },
    "retop_cloudTop": {
      "Type": "Parameter",
      "id": "retop_cloudTop",
      "description": "retop_cloudTop"
    },
    "sf_surface_24hrs_accum_>7.35e-05": {
      "Type": "Parameter",
      "id": "sf_surface_24hrs_accum_>7.35e-05",
      "description": "sf_surface_24hrs_accum_>7.35e-05"
    },
    "snowlr_surface": {
      "Type": "Parameter",
      "id": "snowlr_surface",
      "description": "snowlr_surface"
    },
    "snowlr_surface_10%": {
      "Type": "Parameter",
      "id": "snowlr_surface_10%",
      "description": "snowlr_surface_10%"
    },
    "snowlr_surface_25%": {
      "Type": "Parameter",
      "id": "snowlr_surface_25%",
      "description": "snowlr_surface_25%"
    },
    "snowlr_surface_5%": {
      "Type": "Parameter",
      "id": "snowlr_surface_5%",
      "description": "snowlr_surface_5%"
    },
    "snowlr_surface_50%": {
      "Type": "Parameter",
      "id": "snowlr_surface_50%",
      "description": "snowlr_surface_50%"
    },
    "snowlr_surface_75%": {
      "Type": "Parameter",
      "id": "snowlr_surface_75%",
      "description": "snowlr_surface_75%"
    },
    "snowlr_surface_90%": {
      "Type": "Parameter",
      "id": "snowlr_surface_90%",
      "description": "snowlr_surface_90%"
    },
    "snowlr_surface_95%": {
      "Type": "Parameter",
      "id": "snowlr_surface_95%",
      "description": "snowlr_surface_95%"
    },
    "snowlvl_heightAboveSea": {
      "Type": "Parameter",
      "id": "snowlvl_heightAboveSea",
      "description": "snowlvl_heightAboveSea"
    },
    "snowlvl_surface_10%": {
      "Type": "Parameter",
      "id": "snowlvl_surface_10%",
      "description": "snowlvl_surface_10%"
    }
  }
```

REQUIREMENT 6

```
    },
    "snowlvl_surface_25%":{
      "Type":"Parameter",
      "id":"snowlvl_surface_25%",
      "description":"snowlvl_surface_25%"
    },
    "snowlvl_surface_5%":{
      "Type":"Parameter",
      "id":"snowlvl_surface_5%",
      "description":"snowlvl_surface_5%"
    },
    "snowlvl_surface_50%":{
      "Type":"Parameter",
      "id":"snowlvl_surface_50%",
      "description":"snowlvl_surface_50%"
    },
    "snowlvl_surface_75%":{
      "Type":"Parameter",
      "id":"snowlvl_surface_75%",
      "description":"snowlvl_surface_75%"
    },
    "snowlvl_surface_90%":{
      "Type":"Parameter",
      "id":"snowlvl_surface_90%",
      "description":"snowlvl_surface_90%"
    },
    "snowlvl_surface_95%":{
      "Type":"Parameter",
      "id":"snowlvl_surface_95%",
      "description":"snowlvl_surface_95%"
    },
    "swh_surface":{
      "Type":"Parameter",
      "id":"swh_surface",
      "description":"swh_surface"
    },
    "swh_surface_10%":{
      "Type":"Parameter",
      "id":"swh_surface_10%",
      "description":"swh_surface_10%"
    },
    "swh_surface_50%":{
      "Type":"Parameter",
      "id":"swh_surface_50%",
      "description":"swh_surface_50%"
    },
    "swh_surface_90%":{
      "Type":"Parameter",
      "id":"swh_surface_90%",
      "description":"swh_surface_90%"
    },
    "swh_surface_ens_std_dev":{
      "Type":"Parameter",
      "id":"swh_surface_ens_std_dev",
      "description":"swh_surface_ens_std_dev"
    },
    "t_surface":{
      "Type":"Parameter",
      "id":"t_surface",
      "description":"t_surface"
    },
    "tcdc_cldlayer_1":{
      "Type":"Parameter",
      "id":"tcdc_cldlayer_1",
      "description":"tcdc_cldlayer_1"
    },
    "tcdc_cldlayer_2":{
```

REQUIREMENT 6

```

        "Type": "Parameter",
        "id": "tcdc_cldlayer_2",
        "description": "tcdc_cldlayer_2"
    },
    "tcdc_cldlayer_3": {
        "Type": "Parameter",
        "id": "tcdc_cldlayer_3",
        "description": "tcdc_cldlayer_3"
    },
    "tcdc_cldlayer_above_fl250": {
        "Type": "Parameter",
        "id": "tcdc_cldlayer_above_fl250",
        "description": "tcdc_cldlayer_above_fl250"
    },
    "tcdc_surface": {
        "Type": "Parameter",
        "id": "tcdc_surface",
        "description": "tcdc_surface"
    },
    "tcdc_surface_ens_std_dev": {
        "Type": "Parameter",
        "id": "tcdc_surface_ens_std_dev",
        "description": "tcdc_surface_ens_std_dev"
    },
    "thunc_atmosphere": {
        "Type": "Parameter",
        "id": "thunc_atmosphere",
        "description": "thunc_atmosphere"
    },
    "tmax_heightAboveGround_level-2_12hrs_max": {
        "Type": "Parameter",
        "id": "tmax_heightAboveGround_level-2_12hrs_max",
        "description": "tmax_heightAboveGround_level-2_12hrs_max"
    },
    "tmax_heightAboveGround_level-2_12hrs_max_ens_std_dev": {
        "Type": "Parameter",
        "id": "tmax_heightAboveGround_level-2_12hrs_max_ens_std_dev",
        "description": "tmax_heightAboveGround_level-2_12hrs_max_ens_std_dev"
    },
    "tmin_heightAboveGround_level-2_12hrs_min": {
        "Type": "Parameter",
        "id": "tmin_heightAboveGround_level-2_12hrs_min",
        "description": "tmin_heightAboveGround_level-2_12hrs_min"
    },
    "tmin_heightAboveGround_level-2_12hrs_min_ens_std_dev": {
        "Type": "Parameter",
        "id": "tmin_heightAboveGround_level-2_12hrs_min_ens_std_dev",
        "description": "tmin_heightAboveGround_level-2_12hrs_min_ens_std_dev"
    },
    "tpwdir_heightAboveGround_level-10": {
        "Type": "Parameter",
        "id": "tpwdir_heightAboveGround_level-10",
        "description": "tpwdir_heightAboveGround_level-10"
    },
    "tpwspd_heightAboveGround_level-10": {
        "Type": "Parameter",
        "id": "tpwspd_heightAboveGround_level-10",
        "description": "tpwspd_heightAboveGround_level-10"
    },
    "trwdir_atmosphereSingleLayer": {
        "Type": "Parameter",
        "id": "trwdir_atmosphereSingleLayer",
        "description": "trwdir_atmosphereSingleLayer"
    },
    "trwspd_atmosphereSingleLayer": {

```

REQUIREMENT 6

```
      "Type": "Parameter",
      "id": "trwspd_atmosphereSingleLayer",
      "description": "trwspd_atmosphereSingleLayer"
    },
    "tstm_surface_12hrs_accum": {
      "Type": "Parameter",
      "id": "tstm_surface_12hrs_accum",
      "description": "tstm_surface_12hrs_accum"
    },
    "tstm_surface_1hrs_accum": {
      "Type": "Parameter",
      "id": "tstm_surface_1hrs_accum",
      "description": "tstm_surface_1hrs_accum"
    },
    "tstm_surface_3hrs_accum": {
      "Type": "Parameter",
      "id": "tstm_surface_3hrs_accum",
      "description": "tstm_surface_3hrs_accum"
    },
    "tstm_surface_6hrs_accum": {
      "Type": "Parameter",
      "id": "tstm_surface_6hrs_accum",
      "description": "tstm_surface_6hrs_accum"
    },
    "turb_surface_levels_0-1372": {
      "Type": "Parameter",
      "id": "turb_surface_levels_0-1372",
      "description": "turb_surface_levels_0-1372"
    },
    "veril_atmosphere": {
      "Type": "Parameter",
      "id": "veril_atmosphere",
      "description": "veril_atmosphere"
    },
    "vis_surface": {
      "Type": "Parameter",
      "id": "vis_surface",
      "description": "vis_surface"
    },
    "vis_surface_50%": {
      "Type": "Parameter",
      "id": "vis_surface_50%",
      "description": "vis_surface_50%"
    },
    "vis_surface_<1609.34": {
      "Type": "Parameter",
      "id": "vis_surface_<1609.34",
      "description": "vis_surface_<1609.34"
    },
    "vis_surface_<3218.69": {
      "Type": "Parameter",
      "id": "vis_surface_<3218.69",
      "description": "vis_surface_<3218.69"
    },
    "vis_surface_<4828.03": {
      "Type": "Parameter",
      "id": "vis_surface_<4828.03",
      "description": "vis_surface_<4828.03"
    },
    "vis_surface_<8046.73": {
      "Type": "Parameter",
      "id": "vis_surface_<8046.73",
      "description": "vis_surface_<8046.73"
    },
    "vrate_atmosphereSingleLayer": {
      "Type": "Parameter",
      "id": "vrate_atmosphereSingleLayer",
```

REQUIREMENT 6

```
        "description": "vrate_atmosphereSingleLayer"
    },
    "wdir_heightAboveGround_level-30": {
        "Type": "Parameter",
        "id": "wdir_heightAboveGround_level-30",
        "description": "wdir_heightAboveGround_level-30"
    },
    "wdir_heightAboveGround_level-30_50%": {
        "Type": "Parameter",
        "id": "wdir_heightAboveGround_level-30_50%",
        "description": "wdir_heightAboveGround_level-30_50%"
    },
    "wdir_heightAboveGround_level-80": {
        "Type": "Parameter",
        "id": "wdir_heightAboveGround_level-80",
        "description": "wdir_heightAboveGround_level-80"
    },
    "wdir_heightAboveGround_level-80_50%": {
        "Type": "Parameter",
        "id": "wdir_heightAboveGround_level-80_50%",
        "description": "wdir_heightAboveGround_level-80_50%"
    },
    "wdir_surface_levels_0-610": {
        "Type": "Parameter",
        "id": "wdir_surface_levels_0-610",
        "description": "wdir_surface_levels_0-610"
    },
    "wetglbt_surface": {
        "Type": "Parameter",
        "id": "wetglbt_surface",
        "description": "wetglbt_surface"
    },
    "ws_heightAboveGround_level-30": {
        "Type": "Parameter",
        "id": "ws_heightAboveGround_level-30",
        "description": "ws_heightAboveGround_level-30"
    },
    "ws_heightAboveGround_level-30_50%": {
        "Type": "Parameter",
        "id": "ws_heightAboveGround_level-30_50%",
        "description": "ws_heightAboveGround_level-30_50%"
    },
    "ws_heightAboveGround_level-80": {
        "Type": "Parameter",
        "id": "ws_heightAboveGround_level-80",
        "description": "ws_heightAboveGround_level-80"
    },
    "ws_heightAboveGround_level-80_50%": {
        "Type": "Parameter",
        "id": "ws_heightAboveGround_level-80_50%",
        "description": "ws_heightAboveGround_level-80_50%"
    },
    "ws_surface_levels_0-610": {
        "Type": "Parameter",
        "id": "ws_surface_levels_0-610",
        "description": "ws_surface_levels_0-610"
    }
}
}
```

REQUIREMENT 7

IDENTIFIER /req/nwsviz-application/LREF-parameter-names

STATEMENT The LREF Collection *SHALL* have a defined list of parameter_names

A A LREF Collection *SHALL* have the following parameter_names definition

REQUIREMENT 8

IDENTIFIER /req/nwsviz-application/LREF-TLE-parameter-names

STATEMENT The LREF Collection *SHALL* have a defined list of parameter_names

A A LREF Collection *SHALL* have the following parameter_names definition

REQUIREMENT 9

IDENTIFIER /req/nwsviz-application/MRMS-parameter-names

STATEMENT The MRMS Collection *SHALL* have a defined list of parameter_names

A A MRMS Collection *SHALL* have the following parameter_names definition

STATEMENT

```
{
  "parameter-names":{
    "EchoTop_18":{
      "Type":"Parameter",
      "id":"EchoTop_18",
      "description":"EchoTop_18"
    },
    "EchoTop_30":{
      "Type":"Parameter",
      "id":"EchoTop_30",
      "description":"EchoTop_30"
    },
    "EchoTop_50":{
      "Type":"Parameter",
      "id":"EchoTop_50",
      "description":"EchoTop_50"
    },
    "EchoTop_60":{
      "Type":"Parameter",
      "id":"EchoTop_60",
      "description":"EchoTop_60"
    }
  }
}
```


REQUIREMENT 9

```

    },
    "H50Above0C":{
      "Type":"Parameter",
      "id":"H50Above0C",
      "description":"H50Above0C"
    },
    "H50AboveM20C":{
      "Type":"Parameter",
      "id":"H50AboveM20C",
      "description":"H50AboveM20C"
    },
    "H60Above0C":{
      "Type":"Parameter",
      "id":"H60Above0C",
      "description":"H60Above0C"
    },
    "H60AboveM20C":{
      "Type":"Parameter",
      "id":"H60AboveM20C",
      "description":"H60AboveM20C"
    },
    "LightningProbabilityNext30minGrid":{
      "Type":"Parameter",
      "id":"LightningProbabilityNext30minGrid",
      "description":"LightningProbabilityNext30minGrid"
    },
    "POSH":{
      "Type":"Parameter",
      "id":"POSH",
      "description":"POSH"
    },
    "PrecipFlag":{
      "Type":"Parameter",
      "id":"PrecipFlag",
      "description":"PrecipFlag"
    },
    "RadarOnly_QPE_01H":{
      "Type":"Parameter",
      "id":"RadarOnly_QPE_01H",
      "description":"RadarOnly_QPE_01H"
    },
    "ReflectivityAtLowestAltitude5km":{
      "Type":"Parameter",
      "id":"ReflectivityAtLowestAltitude5km",
      "description":"ReflectivityAtLowestAltitude5km"
    },
    "Reflectivity_-10C":{
      "Type":"Parameter",
      "id":"Reflectivity_-10C",
      "description":"Reflectivity_-10C"
    },
    "Reflectivity_-20C":{
      "Type":"Parameter",
      "id":"Reflectivity_-20C",
      "description":"Reflectivity_-20C"
    },
    "Reflectivity_0C":{
      "Type":"Parameter",
      "id":"Reflectivity_0C",
      "description":"Reflectivity_0C"
    },
    "VII":{
      "Type":"Parameter",
      "id":"VII",
      "description":"VII"
    },
    "VIL":{

```

REQUIREMENT 9

```
    "Type": "Parameter",  
    "id": "VIL",  
    "description": "VIL"  
  }  
}  
}
```

7.4. Query Resources

Table 4 — Query Resource Paths

PATH TEMPLATE	METHOD	RESOURCE
{root}/collections/{collectionId}/ {queryType}	GET, POST (Optional)	Retrieve data according to the query pattern from a Collection with the unique identifier {collectionId}
{root}/collections/{collectionId}/ instances	GET	Retrieve metadata about instances of a collection
{root}/collections/{collectionId}/ instances/{instanceId}	GET	Retrieve metadata from a specific instance of a Collection with the unique identifiers {collectionId} and {instanceId}
{root}/collections/{collectionId}/ instances/{instanceId}/{query Type}	GET, POST (Optional)	Retrieve data according to the query pattern from a specific instance of a Collection with the unique identifiers {collectionId} and {instanceId}

Where:

- {root} = Base URI for the API server
- {collectionId} = an identifier for a specific Collection of data
- {instanceId} = an identifier for a specific version or instance of a Collection of data
- {queryType} = an identifier for a specific query pattern to retrieve data from a specific Collection of data

Path = {root}/collections/{collectionId}/{queryType}

Dependencies: OGC API-Environmental Data Retrieval Standard

REQUIREMENT 10

IDENTIFIER /req/nwsviz-application/data-query

REQUIREMENT 10

INCLUDED IN Requirements class 1: <http://www.example.org/1.0/req/req-class-nwsviz-application>

STATEMENT The collections *SHALL* support a defined set of data queries.

The collections *SHALL* support the following data queries:

- Position
- Cube
- Locations
- Instances

7.4.1. Parameters

The following parameters are supported by all OGC API-EDR queries.

7.4.1.1. Output Format parameter

Data format for the output data (available options are listed in the collectionsresponse).

REQUIREMENT 11

IDENTIFIER /req/nwsviz-application/output-format

INCLUDED IN Requirements class 1: <http://www.example.org/1.0/req/req-class-nwsviz-application>

STATEMENT Collections *SHALL* support the following formats:

A A format with the label **CoverageJSON** *SHALL* provide CoverageJSON output which is described by <https://docs.ogc.org/cs/21-069r2/21-069r2.html>

B A format with the label **NetCDF4** *SHALL* provide CF-NetCDF output which is described by <https://cfconventions.org/Data/cf-conventions/cf-conventions-1.10/> cf-conventions.html

C A format with the label **Zarr** *SHALL* provide Zarr output which is described by <https://zarr-specs.readthedocs.io/en/latest/v3/core/index.html>

7.4.1.2. Parameter queryType

Path — Instance Query {root}/collections/{collectionId}/instances/{instanceId}/{queryType}

7.4.2. Position Query

The Position query returns data for the requested coordinate. Logic for identifying the best match for the coordinate will depend on the Collection and is at the discretion of the query service implementer.

Path = {root}/collections/{collectionId}/instances/{instanceId}/position

Dependencies: OGC API-Environmental Data Retrieval Standard

REQUIREMENT 12

IDENTIFIER /req/nwsviz-application/data-query-cube-position

STATEMENT All Collections in the Service *SHALL* provide support for **Position** queries

A The **Position** query *SHALL* support the following output formats:

- CoverageJSON
- Zarr
- NetCDF

B The default output format for the **Cube** query *SHALL* be **CoverageJSON**

C The **Position** query *SHALL* support the following HTTP methods:

- GET
- POST

7.4.3. Cube Query

The Cube query returns a data cube defined by the bbox and z parameters.

Path = {root}/collections/{collectionId}/instances/{instanceId}/cube

Dependencies: OGC API-Environmental Data Retrieval Standard

REQUIREMENT 13

IDENTIFIER /req/nwsviz-application/data-query-cube

INCLUDED IN Requirements class 1: <http://www.example.org/1.0/req/req-class-nwsviz-application>

STATEMENT All Collections in the Service *SHALL* provide support for **Cube** queries

REQUIREMENT 13

A	The Cube query <i>SHALL</i> support the following output formats:
	<ul style="list-style-type: none"> • CoverageJSON
	<ul style="list-style-type: none"> • Zarr • NetCDF
B	The default output format for the Cube query <i>SHALL</i> be CoverageJSON
C	The Cube query <i>SHALL</i> support the following HTTP methods:
	<ul style="list-style-type: none"> • GET
	<ul style="list-style-type: none"> • POST

7.4.4. Locations Query

The Location query returns a GeoJSON Feature Collection containing the available locations with a collection

Path = {root}/collections/{collectionId}/instances/{instanceId}/locations

Dependencies: OGC API-Environmental Data Retrieval Standard

REQUIREMENT 14

IDENTIFIER /req/nwsviz-application/data-query-locations

STATEMENT All Collections in the Service *SHALL* provide support for **Locations** queries

A The **Locations** query *SHALL* support the following output formats:

- GeoJSON

B The default output format for the **Locations** query *SHALL* be **GeoJSON**

C The **Locations** query *SHALL* support the following HTTP methods:

- GET
- POST

D The **Locations** query *SHALL* provide a listing of the available locations in a collection that conforms to GeoJSON and contains the properties contained in this example:

STATEMENT

```
{
  "type": "FeatureCollection",
  "features": [
    {
      "type": "Feature",
      "geometry": {
        "type": "Polygon",
        "coordinates": [
          [
            -60.154430455510095,
```

REQUIREMENT 14

```

        19.80394886054594
      ],
      [
        -60.154430455510095,
        49.81080204452752
      ],
      [
        -125.13089699982356,
        49.81080204452752
      ],
      [
        -125.13089699982356,
        19.80394886054594
      ],
      [
        -60.154430455510095,
        19.80394886054594
      ]
    ]
  ],
  },
  "properties":{
    "instance":"2025-05-21T12:00:00",
    "name":"CO",
    "name_alt":"link:++http://edr-api-desi-c.mdl.nws.noaa.gov/
collections/HREF/instances/2025-05-21T12:00:00/locations/CO?f=json++[\"",
    "edrqueryendpoint":"link:++http://edr-api-desi-c.mdl.nws.noaa.
gov/collections/HREF/instances/2025-05-21T12:00:00/locations/CO?f=json++[\"",
    "parameter-names":[
      "apcp_1h",
      "apcp_2h",
      "apcp_3h",
      "apcp_accum",
      "apcp_accum-lpmm",
      "apcp_accum_24h",
      "apcp_accum_24h-lpmm",
      "apcp_accum_6h",
      "apcp_accum_6h-lpmm",
      "cape",
      "ceil",
      "ceilingAGL",
      "cfrzr",
      "cicep",
      "cin",
      "colmd",
      "crain",
      "csnow",
      "d2m",
      "dpt_isobaric",
      "dswrf",
      "fram1",
      "fram24",
      "fram24-lpmm",
      "fram6",
      "fram6-lpmm",
      "framtotal",
      "front700",
      "front850",
      "frzr1",
      "frzr24",
      "frzr24-lpmm",
      "frzr6",
      "frzr6-lpmm",
      "frzrtotal",
      "gh1000-gh500",
      "gh700-gh500_lr",
      "gh_isobaric",

```

REQUIREMENT 14

```
"gust",  
"hcc",  
"hlcy_1000",  
"hlcy_3000",  
"inventory",  
"large-fire-potential",  
"lcc",  
"lcl",  
"ltng",  
"massden",  
"mcc",  
"mnuphl_3000",  
"mnuphl_5000",  
"mxuphl_3000",  
"mxuphl_5000",  
"orog",  
"pfrzr",  
"picep",  
"prain",  
"prmsl",  
"psnow",  
"pwat",  
"r2",  
"r_isobaric",  
"refc",  
"refc-lpmm",  
"retop",  
"sdwe_1h",  
"sdwe_2h",  
"sdwe_3h",  
"sdwe_accum",  
"sdwe_accum-lpmm",  
"sdwe_accum_1h",  
"sdwe_accum_24h",  
"sdwe_accum_24h-lpmm",  
"sdwe_accum_6h",  
"sdwe_accum_6h-lpmm",  
"sp",  
"stp",  
"t2m",  
"t_isobaric",  
"ta2",  
"tadv700",  
"tadv850",  
"tcdc",  
"thte2",  
"thte850",  
"thte925",  
"tw2",  
"u10",  
"u_isobaric",  
"v10",  
"v_isobaric",  
"vis",  
"vort500",  
"vucsh",  
"vvcsh",  
"w_isobaric",  
"wd_isobaric",  
"wd_isobaric-mean",  
"wd_isobaric-std",  
"wdir",  
"wdir-mean",  
"wdir-std",  
"ws_isobaric",  
"wshr0-6km",  
"wshrd0-6km",
```

REQUIREMENT 14

```
"wshrd0-6km-mean",
"wshrd0-6km-std",
"wspd"
],
"datetimes":[
  "2025-05-21T13:00:00",
  "2025-05-21T14:00:00",
  "2025-05-21T15:00:00",
  "2025-05-21T16:00:00",
  "2025-05-21T17:00:00",
  "2025-05-21T18:00:00",
  "2025-05-21T19:00:00",
  "2025-05-21T20:00:00",
  "2025-05-21T21:00:00",
  "2025-05-21T22:00:00",
  "2025-05-21T23:00:00",
  "2025-05-22T00:00:00",
  "2025-05-22T01:00:00",
  "2025-05-22T02:00:00",
  "2025-05-22T03:00:00",
  "2025-05-22T04:00:00",
  "2025-05-22T05:00:00",
  "2025-05-22T06:00:00",
  "2025-05-22T07:00:00",
  "2025-05-22T08:00:00",
  "2025-05-22T09:00:00",
  "2025-05-22T10:00:00",
  "2025-05-22T11:00:00",
  "2025-05-22T12:00:00",
  "2025-05-22T13:00:00",
  "2025-05-22T14:00:00",
  "2025-05-22T15:00:00",
  "2025-05-22T16:00:00",
  "2025-05-22T17:00:00",
  "2025-05-22T18:00:00",
  "2025-05-22T19:00:00",
  "2025-05-22T20:00:00",
  "2025-05-22T21:00:00",
  "2025-05-22T22:00:00",
  "2025-05-22T23:00:00",
  "2025-05-23T00:00:00",
  "2025-05-23T01:00:00",
  "2025-05-23T02:00:00",
  "2025-05-23T03:00:00",
  "2025-05-23T04:00:00",
  "2025-05-23T05:00:00",
  "2025-05-23T06:00:00",
  "2025-05-23T07:00:00",
  "2025-05-23T08:00:00",
  "2025-05-23T09:00:00",
  "2025-05-23T10:00:00",
  "2025-05-23T11:00:00",
  "2025-05-23T12:00:00"
],
"desi":{
  "comment":"Complete files (if true) are needed for model to
show up on front end display. Format 2022090912/HREF.complete",
  "name":"HREF",
  "groupname":"HREF",
  "completeFile":true,
  "zarr_config":{
    "data_by_field":false,
    "time_key":"valid_time",
    "lat_key":"latitude",
    "lon_key":"longitude",
    "ens_key":"ensemble",
    "ens_key_text":"names",
```


REQUIREMENT 14

```

        "x_key": "x",
        "y_key": "y",
        "z_key": "isobaricInhPa"
    },
    "x4dDomain": {
        "x4dGrid": [
            40.5,
            -100,
            388,
            270
        ],
        "maxDomainPoints": 105000
    },
    "tiling": {
        "//": "if resolution is 5km, 1 = 5km, 2 = 10km, 4 = 20km",
        "y": 150,
        "x": 150,
        "targetNx": 200,
        "targetNy": 150,
        "resLevels": [
            1,
            2,
            4
        ]
    },
    "region": {
        "name": "CONUS",
        "foldername": "HREF"
    },
    "projDict": {
        "nx": 1160,
        "ny": 678,
        "dx": 5079,
        "dy": 5079,
        "units": "m",
        "first_lat": 19.80394886054594,
        "first_lon": -125.13089699982356,
        "proj": "+proj=lcc +a=6371200.0 +b=6371200.0 +lon_0=265.0
+lat_0=25.0 +lat_1=25.0 +lat_2=25.0"
    },
    "clustering": false,
    "members": {
        "HRW_ARW -12h": [
            "HRW_ARW -12h"
        ],
        "HRW_ARW": [
            "HRW_ARW"
        ],
        "HRW FV3 -12h": [
            "HRW FV3 -12h"
        ],
        "HRW FV3": [
            "HRW FV3"
        ],
        "HRW NSSL -12h": [
            "HRW NSSL -12h"
        ],
        "HRW NSSL": [
            "HRW NSSL"
        ],
        "NAM CONUS Nest -12h": [
            "NAM CONUS Nest -12h"
        ],
        "NAM CONUS Nest": [
            "NAM CONUS Nest"
        ],
        "HRRR -6h": [

```

REQUIREMENT 14

```
        "HRRR -6h"
      ],
      "HRRR": [
        "HRRR"
      ]
    },
    "membersShort": {
      "HRW_ARW -12h": [
        "ARW -12h"
      ],
      "HRW_ARW": [
        "ARW"
      ],
      "HRW_FV3 -12h": [
        "FV3 -12h"
      ],
      "HRW_FV3": [
        "FV3"
      ],
      "HRW_NSSL -12h": [
        "NSSL -12h"
      ],
      "HRW_NSSL": [
        "NSSL"
      ],
      "NAM CONUS Nest -12h": [
        "NAM N. -12h"
      ],
      "NAM CONUS Nest": [
        "NAM N."
      ],
      "HRRR -6h": [
        "HRRR -6h"
      ],
      "HRRR": [
        "HRRR"
      ]
    },
    "memberDepth": 2,
    "resolutionKM": 5,
    "lengthInHours": 48
  },
  "bbox": [
    -125.13089699982356,
    19.80394886054594,
    -60.154430455510095,
    49.81080204452752
  ]
}
}
```

7.4.5. Location Query

The Location query returns a location defined by a bounding box dependent on the indices of i and j.

Path = {root}/collections/{collectionId}/instances/{instanceId}/locations/{locationId}

Dependencies: OGC API-Environmental Data Retrieval Standard

REQUIREMENT 15

IDENTIFIER /req/nwsviz-application/data-query-location

STATEMENT All Collections in the Service *SHALL* provide support for **Locations** queries

A The **Locations** query *SHALL* support the following output formats:

- CoverageJSON
- Zarr
- NetCDF

B The default output format for the **Locations** query *SHALL* be **CoverageJSON**

C The **Locations** query *SHALL* support the following HTTP methods:

- GET
- POST

D The **Locations** query *SHALL* support a custom query parameter called “ij” where the argument represents index values of the rectangular query.

STATEMENT &ij=i0,j0,i1,j1

7.5. General Requirements

7.5.1. HTTP Status Codes

HTTP response

- Response status codes

REQUIREMENT 16

IDENTIFIER /req/nwsviz-application/status-codes

INCLUDED IN Requirements class 1: <http://www.example.org/1.0/req/req-class-nwsviz-application>

STATEMENT The NWSViz profile Collection profile *SHALL* support the following HTTP status codes.

A The message descriptions *SHALL* be as follows:

REQUIREMENT 16

STATEMENT	STATUS CODE	DESCRIPTION
	200	A successful request.
	204	A successful request, but the resource has no data resulting from the request. No additional content or message body is provided.
	304	An entity tag was provided in the request and the resource has not been changed since the previous request.
	400	The server cannot or will not process the request due to an apparent client error. For example, a query parameter had an incorrect value.
	404	The requested resource does not exist on the server. For example, a path parameter had an incorrect value.
	405	The request method is not supported. For example, a POST request was submitted, but the resource only supports GET requests.
	413	Request entity too large. For example, the query would involve returning more data than the server is capable of processing, the implementation should return a message explaining the query limits imposed by the server implementation.
	500	An internal error occurred in the server.

REQUIREMENT 17

IDENTIFIER /req/nwsviz-application/msg-bodies

REQUIREMENT 17

INCLUDED IN Requirements class 1: <http://www.example.org/1.0/req/req-class-nwsviz-application>

STATEMENT The NWSViz profile Collection profile *SHALL* support the following HTTP response body.

A The NWSViz profile Collection *SHALL* use the following JSON schema for error response bodies (HTTP Status Codes 400 and above)

STATEMENT

```
{
  "type": "object",
  "required": [
    "code"
  ],
  "properties": {
    "code": {
      "type": "string"
    },
    "description": {
      "type": "string"
    }
  }
}
```

7.5.2. Links

- Response links

REQUIREMENT 18

IDENTIFIER /req/nwsviz-application/links

INCLUDED IN Requirements class 1: <http://www.example.org/1.0/req/req-class-nwsviz-application>

STATEMENT A NWSViz profile Collection *SHALL* define links as follows:

A All link objects *SHALL* have **href**, **rel** and **type** attributes

B The following links *SHALL* be included in the Collection response

STATEMENT

```
{
  "href": "https://creativecommons.org/licenses/by-nc/4.0/",
  "rel": "licence",
  "type": "text/html"
},
{
  "href": "https://library.wmo.int/viewer/35625?medianame=306_v.I.2_2019_edition_Updated_2022_en_#page=31&viewer=picture",
  "rel": "related",
  "title": "FM 92-XIV GRIB specification",
  "type": "text/html"
}
```

REQUIREMENT 18

}



ANNEX A (INFORMATIVE) CONFORMANCE CLASS ABSTRACT TEST SUITE (NORMATIVE)



ANNEX A

(INFORMATIVE)

CONFORMANCE CLASS ABSTRACT TEST SUITE (NORMATIVE)

A.1. Conformance Class Core

CONFORMANCE CLASS A.1: CONFORMANCE CLASS 'CORE'	
IDENTIFIER	http://www.example.org/1.0/conf-class-nwsviz-application
REQUIREMENTS CLASS	Requirements class 1: http://www.example.org/1.0/req/req-class-nwsviz-application
CONFORMANCE TESTS	Abstract test A.2: /conf/nwsviz-application/root Abstract test A.1: /conf/nwsviz-application/edr-conformant Abstract test A.3: /conf/nwsviz-application/parameter-names Abstract test A.4: /conf/nwsviz-application/collectionid Abstract test A.5: /conf/nwsviz-application/extent Abstract test A.6: /conf/nwsviz-application/output-format Abstract test A.7: /conf/nwsviz-application/status-codes Abstract test A.8: /conf/nwsviz-application/msg-bodies Abstract test A.9: /conf/nwsviz-application/links Abstract test A.10: /conf/nwsviz-application/data-query Abstract test A.1-11: /conf/nwsviz-application/data-query-area Abstract test A.1-12: /conf/nwsviz-application/data-query-corridor Abstract test A.14: /conf/nwsviz-application/data-query-cube Abstract test A.11: /conf/nwsviz-application/data-query-instances Abstract test A.12: /conf/nwsviz-application/data-query-position Abstract test A.1-16: /conf/nwsviz-application/data-query-radius
ABSTRACT TEST A.1	
IDENTIFIER	/conf/nwsviz-application/edr-conformant

ABSTRACT TEST A.1

REQUIREMENT Requirement 1: /req/nwsviz-application/edr-conformant

TEST PURPOSE Validate the the NWSViz profile Collection is a valid OGC API-EDR implementation

TEST METHOD

STEP Verify that that the Collection can pass the OGC API-EDR Part 1 — Core conformance tests.

ABSTRACT TEST A.2

IDENTIFIER /conf/nwsviz-application/root

REQUIREMENT Requirement 2: /req/nwsviz-application_data/root

TEST PURPOSE Validate that the profile defines the service landing page

TEST METHOD

STEP

Verify that the profile defines a **Title** for the service and the value is “NWSViz profile service”

Verify that each link defined for the service has a **href** and **rel** attribute.

Verify that the **Keywords** attribute has the following values:

- Geopotential Height
- Pressure Level
- Specific humidity
- Air temperature
- u-component of wind
- v-component of wind

Verify that the **Provider** attribute has **name** and **url** attributes defined.

Verify that the **Contact** attribute has an **email** attributes defined.

Verify that the **Links** property includes the following link to the OpenAPI definition of the profile:

DESCRIPTION

```
{
  "title": "OpenAPI definition of NWSViz profile profile",
  "href": "https://www.example.org/edr/profile/vextdemo/openapi.
json",
  "rel": "profile",
  "type": "application/json"
```

ABSTRACT TEST A.2

}

ABSTRACT TEST A.3

IDENTIFIER /conf/nwsviz-application/parameter-names

REQUIREMENT Requirement 1-3: /req/nwsviz-application/parameter-names

TEST PURPOSE Verify that NWSViz profile Collection has the correct parameters defined.

TEST METHOD

STEP Validate that the NWSViz profile Collection has the following definition for **parameter_names**.

DESCRIPTION

```
"parameter_names": {
  "z": {
    "type": "Parameter",
    "description": "Geopotential Height",
    "unit": {
      "label": "m",
      "symbol": {
        "value": "m",
        "type": "https://qudt.org/vocab/unit/M"
      }
    },
    "observedProperty": {
      "id": "http://codes.wmo.int/grib2/codeflag/4.2/0-3-5",
      "label": "Geopotential Height"
    },
    "measurementType": {
      "method": "instantaneous",
      "duration": "PT0S"
    }
  },
  "q": {
    "type": "Parameter",
    "description": "Specific humidity",
    "unit": {
      "label": "kg/kg",
      "symbol": {
        "value": "kg%20kg",
        "type": "https://qudt.org/vocab/unit/KiloGM-PER-"
      }
    },
    "observedProperty": {
      "id": "http://codes.wmo.int/grib2/codeflag/4.2/0-1-0",
      "label": "Specific humidity"
    },
    "measurementType": {
      "method": "instantaneous",
      "duration": "PT0S"
    }
  },
  "t": {
    "type": "Parameter",
    "description": "Air temperature",
    "unit": {
      "label": "KiloGM"
    }
  }
}
```

ABSTRACT TEST A.3

```
        "label": "Kelvin",
        "symbol": {
          "value": "K",
          "type": "https://qudt.org/vocab/unit/K"
        }
      },
      "observedProperty": {
        "id": "http://codes.wmo.int/grib2/codeflag/4.2/0-0-0",
        "label": "Air temperature"
      },
      "measurementType": {
        "method": "instantaneous",
        "duration": "PT0M"
      }
    },
    "u": {
      "type": "Parameter",
      "description": "u-component of wind",
      "unit": {
        "label": "m/s",
        "symbol": {
          "value": "m%20s",
          "type": "https://qudt.org/vocab/unit/M-PER-SEC"
        }
      },
      "observedProperty": {
        "id": "http://codes.wmo.int/grib2/codeflag/4.2/_0-2-2",
        "label": "u component of wind"
      },
      "measurementType": {
        "method": "instantaneous",
        "duration": "PT0S"
      }
    },
    "v": {
      "type": "Parameter",
      "description": "v-component of wind",
      "unit": {
        "label": "m/s",
        "symbol": {
          "value": "m%20s",
          "type": "https://qudt.org/vocab/unit/M-PER-SEC"
        }
      },
      "observedProperty": {
        "id": "http://codes.wmo.int/grib2/codeflag/4.2/_0-2-3",
        "label": "v component of wind"
      },
      "measurementType": {
        "method": "instantaneous",
        "duration": "PT0S"
      }
    }
  }
}
```

ABSTRACT TEST A.4

IDENTIFIER	/conf/nwsviz-application/collectionid
REQUIREMENT	Requirement 3: /req/nwsviz-application/collectionid

ABSTRACT TEST A.4

TEST PURPOSE Validate that a collectionid requirement is correctly defined.

TEST METHOD

STEP Verify that collectionids match the following:

DESCRIPTION	id	description
	HREF	High Resolution Ensemble Forecast
	NBM	National Blend of Models
	LREF	Long Range Ensemble Forecast
	LREF_TLE	Long Range Ensemble Forecast Tile-Lagged Ensemble
	MRMS	Multi-Radar/Multi-Sensor Radar Products

ABSTRACT TEST A.5

IDENTIFIER /conf/nwsviz-application/extent

REQUIREMENT Requirement 4: /req/nwsviz-application/extent

TEST PURPOSE Verify that NWSViz profile Collection Extent is correctly defined in the Collection response.

TEST METHOD

STEP Verify that the collection contains a spatial extent and contain an additional attribute named "locations" containing the a list of the available locations within the collection.

```
DESCRIPTION    {
                "spatial":{
                  "bbox":[
                    -180,
                    -90,
                    180,
                    90
                  ],
                  "locations":[
                    "CO",
                    "AK",
                    "HI"
                  ]
                }
              }
```

ABSTRACT TEST A.5

part	Verify that the Profile contains a temporal extent containing an interval and values.
part	Verify that the Profile contains an attribute named instances which contains a list of available instances for the collection.
part	Verify that the Profile contains a custom query dimension with the name "ensemble" containing values and ids.
part	Verify that the Profile contains a vertical extent if applicable

ABSTRACT TEST A.6

IDENTIFIER /conf/nwsviz-application/output-format

REQUIREMENT Requirement 11: /req/nwsviz-application/output-format

TEST PURPOSE Verify that NWSViz profile Collection queries format data responses correctly.

TEST METHOD

Request data with the output format label and verify the response is correct

STEP Verify a output format of **GRIB2** creates a file that has the following structure https://library.wmo.int/viewer/35625?medianame=306_v.I.2_2019_edition_Updated_2022_en_#page=31&viewer=picture

A Verify a output format of **GeoJSON** is compatible with the JSON schema defined in the following repository <https://github.com/opengeospatial/OGC-feat-geo-json>

B Verify a output format of **CoverageJSON** is compatible with the JSON schema defined by <https://docs.ogc.org/cs/21-069r2/21-069r2.html>

C Verify a output format of **NetCDF4** creates a file that has the structure described by <https://cfconventions.org/Data/cf-conventions/cf-conventions-1.10/cf-conventions.html>

D Verify a output format of **CSV** generates a CSV output file with a metadata file which is described by <https://www.w3.org/TR/2015/REC-tabular-data-model-20151217/>

ABSTRACT TEST A.7

IDENTIFIER /conf/nwsviz-application/status-codes

REQUIREMENT Requirement 16: /req/nwsviz-application/status-codes

ABSTRACT TEST A.7

TEST PURPOSE Verify that NWSViz profile Collection has the correct HTTP status responses.

TEST METHOD

STEP

Verify that a valid request returns a HTTP status code of 200

Verify that a valid request with an empty response returns a HTTP status code of 204

Verify that a request with an invalid query parameter value returns a HTTP status code of 400

Verify that that an unsupported HTTP method request returns a HTTP status code of 405.

Verify that a request for too much data returns a HTTP status code of 413.

Verify that a invalid request caused by an unexpected error returns a HTTP status code of 500.

ABSTRACT TEST A.8

IDENTIFIER /conf/nwsviz-application/msg-bodies

REQUIREMENT Requirement 17: /req/nwsviz-application/msg-bodies

TEST PURPOSE Verify that NWSViz profile error response messages have the correct structure.

TEST METHOD

STEP

Verify the the message body returned by error messages (status codes 400,405,413 and 500) is JSON based on the following schema:

DESCRIPTION

```
{
  "type": "object",
  "required": [
    "code"
  ],
  "properties": {
    "code": {
      "type": "string"
    },
    "description": {
      "type": "string"
    }
  }
}
```

ABSTRACT TEST A.9

IDENTIFIER /conf/nwsviz-application/links

REQUIREMENT Requirement 18: /req/nwsviz-application/links

TEST PURPOSE Verify that NWSViz profile Collection Links section contains the required links

TEST METHOD

STEP Verify that all links in the NWSViz profile Collection have **href**, **rel** and **type** attributes

Verify that NWSViz profile Collection Links section contains the required links:

DESCRIPTION

```
{
  "href": "https://creativecommons.org/licenses/by-nc/4.0/",
  "rel": "licence",
  "type": "text/html"
},
{
  "href": "https://library.wmo.int/viewer/35625?medianame=306_v.I.2_2019_edition_Updated_2022_en_#page=31&viewer=picture",
  "rel": "related",
  "title": "FM 92-XIV GRIB specification",
  "type": "text/html"
}
```

ABSTRACT TEST A.10

IDENTIFIER /conf/nwsviz-application/data-query

REQUIREMENT Requirement 10: /req/nwsviz-application/data-query

TEST PURPOSE Verify that all required NWSViz profile Collection queries are defined in the Collection response.

TEST METHOD

STEP Verify that the Collection response includes definitions for the following queries.

- Position
- Cube
- Locations
- Instances

ABSTRACT TEST A.11

IDENTIFIER /conf/nwsviz-application/data-query-instances

ABSTRACT TEST A.11

REQUIREMENT Requirement 1-13: /req/nwsviz-application-data/data-query-instances

TEST PURPOSE Verify that NWSViz profile Collection **Instances** query is correctly defined in the Collection response.

TEST METHOD

STEP Verify that NWSViz profile Collection has a **Instances** data query defined.

Verify the **Instances** ids str against the Regular expression `^\d{4}-\d{2}-\d{2}T\d{2}:\d{2}Z$`

ABSTRACT TEST A.12

IDENTIFIER /conf/nwsviz-application/data-query-position

REQUIREMENT Requirement 1-8: /req/nwsviz-application/data-query-position

TEST PURPOSE Verify that NWSViz profile Collection **Position** query is correctly defined in the Collection response.

TEST METHOD

Verify that NWSViz profile Collection **Position** query defines the following output_format types

- CoverageJSON
- Zarr
- NetCDF

Verify that NWSViz profile Collection **Position** query defines the following default output_format.

- CoverageJSON

STEP

Verify that NWSViz profile Collection **Position** requirement supports the following HTTP operations

- GET
- POST

Verify that NWSViz profile Collection **Position** requirement supports the following custom query dimension

DESCRIPTION `&ij=i0,j0,i1,j1`

ABSTRACT TEST A.13

IDENTIFIER /conf/nwsviz-application/data-query-locations

REQUIREMENT Requirement 14: /req/nwsviz-application/data-query-locations

TEST PURPOSE Verify that NWSViz profile Collection **Locations** query is correctly defined in the Collection response.

TEST METHOD

Verify that NWSViz profile Collection **Locations** query defines the following output_format types

- GeoJSON

Verify that NWSViz profile Collection **Locations** query defines the following default output_format.

- CoverageJSON

STEP

Verify that NWSViz profile Collection **Locations** requirement supports the following HTTP operations

- GET
- POST

Verify that the response provides a listing of the available locations in a collection that conforms to GeoJSON and contains the properties contained in this example:

DESCRIPTION

```
{
  "type": "FeatureCollection",
  "features": [
    {
      "type": "Feature",
      "geometry": {
        "type": "Polygon",
        "coordinates": [
          [
            [
              -60.154430455510095,
              19.80394886054594
            ],
            [
              -60.154430455510095,
              49.81080204452752
            ],
            [
              -125.13089699982356,
              49.81080204452752
            ],
            [
              -125.13089699982356,
              19.80394886054594
            ],
            [
              -60.154430455510095,
              19.80394886054594
            ]
          ]
        ]
      }
    }
  ]
}
```

ABSTRACT TEST A.13

```
-60.154430455510095,  
19.80394886054594  
]  
]  
]  
},  
"properties":{  
  "instance":"2025-05-21T12:00:00",  
  "name":"CO",  
  "name_alt":"link:++http://edr-api-desi-c.mdl.nws.noaa.gov/  
collections/HREF/instances/2025-05-21T12:00:00/locations/CO?f=json++[]",  
  "edrqueryendpoint":"link:++http://edr-api-desi-c.mdl.nws.noaa.  
gov/collections/HREF/instances/2025-05-21T12:00:00/locations/CO?f=json+  
+[]",  
  "parameter-names":[  
    "apcp_1h",  
    "apcp_2h",  
    "apcp_3h",  
    "apcp_accum",  
    "apcp_accum-lpmm",  
    "apcp_accum_24h",  
    "apcp_accum_24h-lpmm",  
    "apcp_accum_6h",  
    "apcp_accum_6h-lpmm",  
    "cape",  
    "ceil",  
    "ceilingAGL",  
    "cfrzr",  
    "cicep",  
    "cin",  
    "colmd",  
    "crain",  
    "csnow",  
    "d2m",  
    "dpt_isobaric",  
    "dswrf",  
    "fram1",  
    "fram24",  
    "fram24-lpmm",  
    "fram6",  
    "fram6-lpmm",  
    "framtotal",  
    "front700",  
    "front850",  
    "frzr1",  
    "frzr24",  
    "frzr24-lpmm",  
    "frzr6",  
    "frzr6-lpmm",  
    "frzrtotal",  
    "gh1000-gh500",  
    "gh700-gh500_lr",  
    "gh_isobaric",  
    "gust",  
    "hcc",  
    "hlcy_1000",  
    "hlcy_3000",  
    "inventory",  
    "large-fire-potential",  
    "lcc",  
    "lcl",  
    "ltng",  
    "massden",  
    "mcc",  
    "mnuphl_3000",  
    "mnuphl_5000",  
    "mxuphl_3000",
```

```

"mxuphl_5000",
"orog",
"pfrzr",
"picep",
"prain",
"prmsl",
"psnow",
"pwat",
"r2",
"r_isobaric",
"refc",
"refc-lpmm",
"retop",
"sdwe_1h",
"sdwe_2h",
"sdwe_3h",
"sdwe_accum",
"sdwe_accum-lpmm",
"sdwe_accum_1h",
"sdwe_accum_24h",
"sdwe_accum_24h-lpmm",
"sdwe_accum_6h",
"sdwe_accum_6h-lpmm",
"sp",
"stp",
"t2m",
"t_isobaric",
"ta2",
"tadv700",
"tadv850",
"tcdc",
"thte2",
"thte850",
"thte925",
"tw2",
"u10",
"u_isobaric",
"v10",
"v_isobaric",
"vis",
"vort500",
"vucsh",
"vvcsh",
"w_isobaric",
"wd_isobaric",
"wd_isobaric-mean",
"wd_isobaric-std",
"wdir",
"wdir-mean",
"wdir-std",
"ws_isobaric",
"wshr0-6km",
"wshrd0-6km",
"wshrd0-6km-mean",
"wshrd0-6km-std",
"wspd"
],
"datetimes":[
"2025-05-21T13:00:00",
"2025-05-21T14:00:00",
"2025-05-21T15:00:00",
"2025-05-21T16:00:00",
"2025-05-21T17:00:00",
"2025-05-21T18:00:00",
"2025-05-21T19:00:00",
"2025-05-21T20:00:00",
"2025-05-21T21:00:00",

```

```

"2025-05-21T22:00:00",
"2025-05-21T23:00:00",
"2025-05-22T00:00:00",
"2025-05-22T01:00:00",
"2025-05-22T02:00:00",
"2025-05-22T03:00:00",
"2025-05-22T04:00:00",
"2025-05-22T05:00:00",
"2025-05-22T06:00:00",
"2025-05-22T07:00:00",
"2025-05-22T08:00:00",
"2025-05-22T09:00:00",
"2025-05-22T10:00:00",
"2025-05-22T11:00:00",
"2025-05-22T12:00:00",
"2025-05-22T13:00:00",
"2025-05-22T14:00:00",
"2025-05-22T15:00:00",
"2025-05-22T16:00:00",
"2025-05-22T17:00:00",
"2025-05-22T18:00:00",
"2025-05-22T19:00:00",
"2025-05-22T20:00:00",
"2025-05-22T21:00:00",
"2025-05-22T22:00:00",
"2025-05-22T23:00:00",
"2025-05-23T00:00:00",
"2025-05-23T01:00:00",
"2025-05-23T02:00:00",
"2025-05-23T03:00:00",
"2025-05-23T04:00:00",
"2025-05-23T05:00:00",
"2025-05-23T06:00:00",
"2025-05-23T07:00:00",
"2025-05-23T08:00:00",
"2025-05-23T09:00:00",
"2025-05-23T10:00:00",
"2025-05-23T11:00:00",
"2025-05-23T12:00:00"
],
"desi":{
  "comment":"Complete files (if true) are needed for model
to show up on front end display.  Format 2022090912/HREF.complete",
  "name":"HREF",
  "groupname":"HREF",
  "completeFile":true,
  "zarr_config":{
    "data_by_field":false,
    "time_key":"valid_time",
    "lat_key":"latitude",
    "lon_key":"longitude",
    "ens_key":"ensemble",
    "ens_key_text":"names",
    "x_key":"x",
    "y_key":"y",
    "z_key":"isobaricInhPa"
  },
  "x4dDomain":{
    "x4dGrid":[
      40.5,
      -100,
      388,
      270
    ],
    "maxDomainPoints":105000
  },
  "tiling":{

```

ABSTRACT TEST A.13

```

20km",
    "//":"if resolution is 5km, 1 = 5km, 2 = 10km, 4 =
    "y":150,
    "x":150,
    "targetNx":200,
    "targetNy":150,
    "resLevels":[
        1,
        2,
        4
    ]
},
"region":{
    "name":"CONUS",
    "foldername":"HREF"
},
"projDict":{
    "nx":1160,
    "ny":678,
    "dx":5079,
    "dy":5079,
    "units":"m",
    "first_lat":19.80394886054594,
    "first_lon":-125.13089699982356,
    "proj":"+proj=lcc +a=6371200.0 +b=6371200.0 +lon_0=
265.0 +lat_0=25.0 +lat_1=25.0 +lat_2=25.0"
},
"clustering":false,
"members":{
    "HRW_ARW -12h":[
        "HRW_ARW -12h"
    ],
    "HRW_ARW":[
        "HRW_ARW"
    ],
    "HRW_FV3 -12h":[
        "HRW_FV3 -12h"
    ],
    "HRW_FV3":[
        "HRW_FV3"
    ],
    "HRW_NSSL -12h":[
        "HRW_NSSL -12h"
    ],
    "HRW_NSSL":[
        "HRW_NSSL"
    ],
    "NAM_CONUS_Nest -12h":[
        "NAM_CONUS_Nest -12h"
    ],
    "NAM_CONUS_Nest":[
        "NAM_CONUS_Nest"
    ],
    "HRRR -6h":[
        "HRRR -6h"
    ],
    "HRRR":[
        "HRRR"
    ]
},
"membersShort":{
    "HRW_ARW -12h":[
        "ARW -12h"
    ],
    "HRW_ARW":[
        "ARW"
    ],
    "HRRR":

```

ABSTRACT TEST A.13

```
        "HRW FV3 -12h":[
            "FV3 -12h"
        ],
        "HRW FV3":[
            "FV3"
        ],
        "HRW NSSL -12h":[
            "NSSL -12h"
        ],
        "HRW NSSL":[
            "NSSL"
        ],
        "NAM CONUS Nest -12h":[
            "NAM N. -12h"
        ],
        "NAM CONUS Nest":[
            "NAM N."
        ],
        "HRRR -6h":[
            "HRRR -6h"
        ],
        "HRRR":[
            "HRRR"
        ]
    },
    "memberDepth":2,
    "resolutionKM":5,
    "lengthInHours":48
},
"bbox":[
    -125.13089699982356,
    19.80394886054594,
    -60.154430455510095,
    49.81080204452752
]
}
}
}
```

ABSTRACT TEST A.14

IDENTIFIER /conf/nwsviz-application/data-query-cube

REQUIREMENT Requirement 13: /req/nwsviz-application/data-query-cube

TEST PURPOSE Verify that NWSViz profile Collection **Cube** query is correctly defined in the Collection response.

TEST METHOD

Verify that NWSViz profile Collection **Cube** query defines the following output_format types

- CoverageJSON

STEP

- Zarr
- NetCDF

ABSTRACT TEST A.14

Verify that NWSViz profile Collection **Cube** query defines the following default output_format.

- CoverageJSON

Verify that NWSViz profile Collection **Cube** query requirement supports the following HTTP operations

- GET
- POST



ANNEX B (INFORMATIVE) REVISION HISTORY



ANNEX B

(INFORMATIVE)

REVISION HISTORY

Table B.1

DATE	RELEASE	EDITOR	PRIMARY CLAUSES MODIFIED	DESCRIPTION
2016-04-28	0.1	G. Editor	all	initial version



BIBLIOGRAPHY





BIBLIOGRAPHY

- [1] OGC: *OGC Testbed 12 Annex B: Architecture* (2015).