Digital Data sets

NAM/CAR Data Sets Management and eCharts Workshop

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Your Presenter:

Antonio Locandro

- Instrument Flight Procedure Design Expert
- Aeronautical Information Expert
  - +16 Year Industry Experience
  - Aeronautical Charting & GIS Expert
  - AIM and IFP Training Expert
  - Participant of ICAO AIXM CCB and Advisor to IFAIMA for ICAO AIM WG-A
  - Participated as expert for ICAO Technical Cooperation Bureau for Obstacle Assessment for Airport Master Plan

What are digital data sets?

Annex 15

Aeronautical information product. Aeronautical data and aeronautical information provided either as digital data sets or as a standardized presentation in paper or electronic media. Aeronautical information products include:

— Aeronautical Information Publication (AIP), including Amendments and Supplements;

— Aeronautical Information Circulars (AIC);

— aeronautical charts;

— NOTAM; and

— digital data sets.

Note.—Aeronautical information products are intended primarily to satisfy international requirements for the exchange of aeronautical information.

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Data product. Data set or data set series that conforms to a data product specification (ISO 19131*).

Data product specification. Detailed description of a data set or data set series together with additional information that will enable it to be created, supplied to and used by another party (ISO 19131*).

Note.— A data product specification provides a description of the universe of discourse and a specification for mapping the universe of discourse to a data set. It may be used for production, sales, end-use or other purpose.

Example of Digital Product Specifcation (DPS)

Data product specification for Obstacle data set (ICAO) – Austria

Title	Data product specification for Obstacle data set (ICAO) – Austria
Creator	Austro Control GmbH
Date	2020-10-30
Subject	Data product specification for Obstacle data set (ICAO) – Austria
Publisher	Austro Control GmbH - ATM/AIM/SDM
Type	Text
Description	This document describes the specification for the Obstacle data set (ICAO) – Austria and information related to it according to the applicable international standards and regulations
Contributor	Austro Control GmbH - ATM/AIM/SDM
Format	Portable Document Format (PDF)
Source	/
Rights	/
Identifier	DPS_ ICAO_ObstacleDataSet_1.0.pdf
Language	English
Relation	ICAO Annex 15, ICAO Doc 10066

Change History

Version	Date	Reason for Change	Affected Sections
0.1	2020-10-05	Creation of document	All
1.0	2020-10-30	Update of document	All

Table of Content

1. SCOPE

This document specifies a harmonised data specification for the publication of obstacle data in digital form as defined in ICAO Annex 15 and ICAO Doc 10066 and is the basis for implementing the rules according to Chapter 5.3.3.4 of ICAO Annex 15. The Obstacle Data Set (ICAO) – Austria includes all obstacles within Area 1 of the FIR Wien (LOVV).

Purpose

This data product specification is intended for individuals and organizations using Obstacle data set (ICAO) – Austria.

The purpose of this guidelines is:

- To provide a consistent basis for data users.
- To provide a technical documentation of the provision of digital data sets.
- To provide a definition of all values and characteristics (features and attributes) of the data that is necessary.
- To provide a summary of quality and integrity requirements of international standards.

Example of Digital Product Specifcation (DPS)

2. OVERVIEW

2.1. Name and acronyms

Data product specification for Obstacle data set (ICAO) – Austria.

DPS Obstacle data set (ICAO) – Austria

2.2. Informal description

This data product specification describes the attributes related to obstacle data and their quality requirements. The obstacle data set will be provided in AIXM 5.1.1, Excel and KML file format.

2.3. Normative References

[COMMISSION IMPLEMENTING REGULATION (EU) 2017/373]	COMMISSION IMPLEMENTING REGULATION (EU) 2017/373 of 1 March 2017 laying down common requirements for providers of air traffic management/air navigation services and other air traffic management network functions and their oversight.
[ICAO Annex 4]	ICAO Annex 4 - Aeronautical Charts
[ICAO Annex 15]	ICAO Annex 15 - Aeronautical Information Services
[ICAO Doc 10066]	ICAO Procedures of Air Navigation Services – Aeronautical Information Management (PANS-AIM)
[ICAO Doc 9674]	ICAO Doc 9674 - World Geodetic System - 1984 (WGS-84) Manual
[ISO 19111]	EN ISO 19111:2003, Geographic information – Spatial referencing by coordinates
[ISO 19115]	EN ISO 19115:2005, Geographic information – Metadata
[ISO 19131]	EN ISO 19131:2007, Geographic information – Data product specification

2.4. Information about the creation of the specification

Document title:	Data product specification for Obstacle data set (ICAO) – Austria
Reference date:	2020-10-05
Responsible party:	Austro Control GmbH - ATM/AIM/SDM
Language:	English

2.5. Terms and definitions

Many of the terms and definitions in this document are taken from the International Standards ISO 19131 (Geographic Information – Data product specification).

2.6. Symbols and abbreviations

This is a list of abbreviations and acronyms used in the data specification

AGL	Above Ground Level
AICM	Aeronautical Information Conceptual Model
AIM	Aeronautical Information Management
AIP	Aeronautical Information Publication
AIS	Aeronautical Information Service
AIXM	Aeronautical Information Exchange Model
ATM	Air Traffic Management
DPS	Data Product Specification
EVRS	European Vertical Reference System
ICAO	International Civil Aviation Organization
ISO	International Organization for Standardization
ITRS	International Terrestrial Reference System
ITRF	International Terrestrial Reference Frame
KML	Keyhole Markup Language
MGI	Militärgeographisches Institut
MSL	Mean Sea Level
OGC	Open Geospatial Consortium
PDF	Portable Document Format
SDI	Spatial Data Infrastructure
SDM	Static Data Management
UTC	Universal Time Coordinated
XML	Extended Markup Language
XLSX	Microsoft Excel

2.7. Conformance

Any data set claiming conformance with this data specification shall pass the requirements as described in ICAO Annex 15 and ICAO Doc 10066.

3. SPECIFICATION SCOPE

3.1. General specification scope

This data product specification is valid for all obstacle data published in digital form as Obstacle data set (ICAO) – Austria

This data product specification applies to:

- Obstacles according to §85 paragraph 2(1) of the Austrian Aviation Act[1] (corresponds to ICAO Coverage Area 1 as specified in ICAO Annex 15 Chapter 5.3.3.1).
- Obstacles according to §85 paragraph 2(2) of the Austrian Aviation Act (obstacles exceeding 30 M AGL located on a significant natural or artificial elevation).
- Obstacles within ICAO Area 2 are currently not part of the obstacle data set.
- This data product specification does not apply to collecting obstacle data.
- This data product specification specifies minimum requirements. In cases where it is appropriate the minimum requirements can be exceeded.
- Non-conformity to ICAO Annex 15 and ICAO Doc 10066 shall be stated explicitly.

[1] Luftfahrtgesetz

4. IDENTIFICATION INFORMATION

Title:	Data product specification for Obstacle data set (ICAO) – Austria
Abstract:	This data product specification is valid for all obstacle data published in digital form.
Topic categories:	Transportation (018)
Geographic description:	This data product specification is valid for obstacles in the state territory of Austria
Purpose:	The purpose of this document is to specify a harmonised data specification for Obstacle data set (ICAO) – Austria.
Spatial representation type:	Markup Language
Spatial resolution:	See chapter 7.
Supplementary information:	The structure follows the ISO standard for data specification (ISO 19131).

Example of Digital Product Specifcation (DPS)

5. DATA CONTENT AND STRUCTURE

5.1. Narrative information

The Obstacle data set (ICAO) – Austria is provided in three different file formats:

File format	Description
AIXM 5.1.1	Use for machine-readable applications.
Excel	Use for human-readable applications.
KML	Use for display of geographical data.

5.2. AIXM 5.1.1.

AIXM (Aeronautical Information Exchange Model) enables the provision of aeronautical data in digital form. Since aeronautical data can be quite complex it is necessary to use information engineering standards which support current and future information system requirements.

The AIXM 5.1.1 format is an internationally standardized data exchange format which, according to the Commission Regulation (EU) No. 73/2010, is intended for the digital exchange of aeronautical data and information. This format is best suited for an automated software-supported transfer of the obstacle data.

The AIXM 5.1.1 file contains all current obstacles and all obstacles whose end-of-lifetime has been reached since the publication of the preceding Obstacle data set.

For further information on AIXM, please visit:
http://aixm.aero/sites/aixm.aero/files/imce/AIXM511HTML/index.html

5.3. Excel

The Excel (XLSX) file format (Microsoft ® Excel ® 2016) is a spreadsheet format. It is structured based on the table contained in AIP chapter ENR 5.4 and is therefore best suited for human interpretation. The Excel format also enables digital transfer and analysis of the obstacle data, but the structure can be adapted if needed or as a result of future requirements. Compared to the table in AIP chapter ENR 5.4, the Excel format includes the following additional columns: geometry, coordinates in decimal degrees, vertical reference system and identifier. In addition to the complete overview of obstacle data, all new, changed and deleted obstacle data are listed in separate tabs

Annex A shows definitions of attributes in the Excel.

There are five worksheets available:

Worksheet	Description
Metadaten - Metadata:	Lists metadata information of the Obstacle data set (ICAO) – Austria
Alle – All:	All obstacles effective on the stated effective date
Neu – New:	New obstacles added on the stated effective date

Geaendert – Changed:	Changed obstacles in comparison to last effective date (changed attributes are colour-coded)
Geloescht – Deleted:	Obstacles deleted on the stated effective date

5.4. KML

KML (Keyhole Markup Language) is a format used to display geographic data. KML is an international standard maintained by the OGC. Please note that the KML file format does not comply with ICAO Annex 15 standards and shall only be used for visualizing the data. This also applies to the KMZ (compressed KML) file format. For more information, please visit: https://www.ogc.org/standards/kml/

5.5. Feature catalogue for Obstacle data set (ICAO) – Austria

Feature Catalogue for Excel format

Name:	Feature Catalogue for data and information related to Obstacle Data Set (ICAO) – Austria for Excel format
Scope:	Identification of all geospatial and non-geospatial attributes.
Field of Application:	Publication of Obstacle data set (ICAO) – Austria.
Version Number:	1.0
Version Date:	2020-10-05
Feature Catalogue Producer:	
Producer Name:	Katrin Stepanek
Producer Organisation:	Austro Control GmbH
Producer Address:	Wagramer Straße 19, 1220, Wien
Producer Country:	Austria
Phone:	+43 5 1703-3282
Facsimile:	+43 5 1703-2036
Electronic Mail Address:	aim.sdm@austrocontrol.at

See Annex A for details.

6. REFERENCE SYSTEMS

6.1. Horizontal reference system

The horizontal reference system used for all geographical coordinates is the **World Geodetic System-1984 (WGS-84)**. The WGS-84 coordinate system is aligned with the International Terrestrial Reference System (ITRS), realised through the International Terrestrial Reference Frame (ITRF) at a defined epoch.

Following information for the reference system shall be considered:

Name element	Entry	Comments
Coordinate system name	WGS-84	
Coordinate system alias	WGS-84, ITRF 2000 (Epoch 2000-01-01)	
Coordinate system type	geodetic	
Datum realization epoch	2000-01-01	
Datum validity	Latitude: [-90°, 90°] Longitude: [-180°, 180°]	
Reference ellipsoid	WGS-84	
Semi-major axis	6378137,0 m	
Inverse flattening	298,257223563	
Remarks	See website: http://itrf.ensg.ign.fr/	

Example of Digital Product Specifcation (DPS)

6.2. Vertical reference system

Elevations are based on two different vertical reference systems: EVRS (Amsterdam) or MGI Austria (Adria).

The European Vertical Reference System (EVRS) is based on orthometric heights in relation to the tide gauge of Amsterdam (NAP).

The Vertical Reference System of Austria "MGI-Gebrauchshöhen – Elevation above the Adriatic" is related to the 1875 tide gauge of Trieste.

Refer to the website of the Austrian Geodetic Institute (Bundesamt für Eich- und Vermessungswesen) https://www.bev.gv.at for the transformation between vertical reference systems.

Obstacles with a vertical reference system based on ADRIA do not, in their entirety, meet the data quality requirements laid down in ICAO Doc 10066 and the Commission Regulation (EU) No 73/2010.

The height difference between EVRS and "MGI-Gebrauchshöhen - Elevation above the Adriatic" ranges from +0.1 metres (Austrian mountains with an elevation greater than 10,000 feet) to -0.5 metres (Eastern part of Austria).

Listed below are the information about EVRS:

Element name	Entry	Comments
Vertical datum name	European Veritcal Reference System (EVRS)	
Datum validity	Europe	
Citation	Web Project EVRS, see http://www.euref.eu/	

For more information, please visit GEN 2.1.4 of the AIP AUSTRIA.

https://eaip.austrocontrol.at/

6.3. Temporal reference system

The Gregorian calendar shall be used as a reference system for date values, and the Universal Time Coordinated (UTC) or the local time including the time zone as an offset from UTC shall be used as a reference system for time values.

7. DATA QUALITY

7.1. Quality Requirements

The following table shows basic quality requirements of obstacle data within Area 1. For further information, see ICAO Doc 10066 Data Catalogue Table A1-6: Obstacle Data.

	Accuracy	Integrity	Origination Type	Publication Resolution	Chart Resolution
Horizontal position	50m	Routine	Surveyed	1 sec	As plotted
Vertical position	30m	Routine	Surveyed	1m or 1ft	3m (10ft)

7.2. Non-compliance

Elevations are based on two different vertical reference systems: EVRS (Amsterdam) or MGI Austria (Adria), see also chapter 6.2.of this document and GEN 2.1.4 of the AIP AUSTRIA.

Obstacles with a vertical reference system based on ADRIA do not, in their entirety, meet the data quality requirements laid down in ICAO Doc 10066 and the Commission Regulation (EU) No 73/2010.

8. METADATA

8.1. Regulations and references

[ISO 19131] Geographic information - Data product specification	"The core metadata elements as defined in ISO 19115 shall be included with the data product. Any additional metadata items required to be supplied shall be stated in the data product specification. The format and encoding of the metadata shall be stated in the data product specification."
[ISO 19115] Geographic information - Metadata	This International Standard (ISO 19115) defines an extensive set of metadata elements; typically only a subset of the full number of elements is used. However, it is essential that a basic minimum number of metadata elements is maintained for a dataset. Listed are the core metadata elements required to identify a dataset, typically for catalogue purposes. This list contains metadata elements answering the following questions: "Does a dataset on a specific topic exist ('what')?", "For a specific place ('where')?", "For a specific date or period ('when')?" and "A point of contact to learn more about or order the dataset ('who')?" *Dataset title* *Dataset reference date* *Geographic location of the dataset* *Dataset language* *Dataset character set* *Dataset topic category* *Abstract describing the dataset* *Metadata language* *Metadata character set* *Metadata point of contact* *Metadata date stamp*
[ADQ] Commission Regulation (EU) No 73/2010	Annex I, Part A: 1. The aeronautical data and aeronautical information […] shall be provided according to a common data set specification which shall: h) base the description of the metadata information on the ISO standard referred to in point 15 of Annex III; i) include the metadata items listed in Annex I, Part C. The metadata […] shall include the following items, as a minimum: *(a) the data originator of the data;* *(b) amendments made to the data;* *(c) the persons or organisations that have interacted with the data and when;* *(d) details of any validation and verification of the data that has been performed;* *(e) effective start date and time of the data;* *(f) for geospatial data:* *— the earth reference model used,*

Example of Digital Product Specifcation (DPS)

	— the coordinate system used; *(g) for numerical data:* *— the statistical accuracy of the measurement or calculation technique used,* *— the resolution,* *— the confidence level as required by the ICAO standards referred to in points 1 and 12 of Annex III and in other relevant ICAO standards;* *(h) details of any functions applied if data has been subject to conversion/transformation;* *(i) details of any limitations on the use of the data.*
[ICAO Annex 15]	*4.2. Metadata* *Note.- Details specifications concerning metadata are contained in the PANS-AIM (Doc 10066)*
[ICAO PANS-AIM Doc 10066]	*5.3.2. Metadata* *a) names of the organizations or entities providing the data set;* *b) the date and time when the data set was provided;* *c) period of validity of the data set; and* *d) any limitations with regard to the use of the data set.* *Note. ISO Standard 191115 specifies requirements for geographic information metadata.*

8.2. Metadata elements

Listed below are the core metadata elements (mandatory and recommended optional) required for describing a dataset.

Metadata Element [ISO 19115]	Regulation	Description
Dataset title	ISO 19115 Core	Title of the dataset e.g. Obstacle data set (ICAO) – Austria
Dataset responsible party	ICAO Annex 15: Data originator identifier	Name of organization and persons who are providing data set. e.g. Austro Control GmbH including address, E-Mail address, and internet link.
Lineage	ICAO Doc 10066: b) date and time when the data set was provided c) period of validity of the data set	Date and time of processing the data, and effective date of data

Metadata Element [ISO 19115]	Regulation	Description
Geographic location of the dataset	ISO 19115 Core ICAO Annex 15: Area of coverage	Coordinates or Bounding Box of a feature e.g. Austrian state territory
Abstract describing the dataset	ISO 19115 Core	Short description about the dataset, this will be covered by the dataset title.
Constraints	ISO 19115 Core	Use and access constraints, disclaimer
Reference Systems	ICAO Doc 10066 Data Catalogue	e.g. horizontal and vertical reference systems
Topic	ISO 19115	e.g. transportation

9. DATA CAPUTRE AND DELIVERY INFORMATION

For information regarding obstacle data capture and data delivery please visit:

https://www.austrocontrol.at/flugsicherung/aim/datenauflieferung_gemaess_adq/

10. DATA SET PROVISION AND MAINTENANCE

10.1. Maintenance: Update cycles for Obstacle data set (ICAO) – Austria

The Obstacle Data Set (ICAO) – Austria shall be updated each quarter with AUSTRIA AIP NON-AIRAC Amendments. The effective date of each data set can be found in the metadata of each data set. Obstacle Data Set (ICAO) – Austria will be published at least two weeks before its effective date.

10.2. Obstacle Data Set (ICAO) – Austria Provision

The Obstacle Data Set (ICAO) – Austria shall be provided via internet link to Austro Control's SDI portal and Austro Control's main portal.

https://sdimd-free.austrocontrol.at/geonetwork/srv/eng/catalog.search#/metadata/12411efc-c816-488c-babc-a6a2b2005279

https://www.austrocontrol.at/en/pilots/pre-flight_preparation/aim_products/obstacle_data_set_icao

Example of Digital Product Specifcation (DPS)

11. BIBLIOGRAPHY

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https://sdimd-free.austrocontrol.at/geonetwork/srv/eng/catalog.search#/metadata/12411efc-c816-488c-babc-a6a2b2005279

BEV – Bundesamt für Eich und Vermessungswesen
http://www.bev.gv.at

EUROCAE
EUROCAE ED-98 / RTCA DO-276 / User Requirements for Terrain and Obstacle data,version C, October 2015.

EUROCONTROL (05.10.2020)
https://ext.eurocontrol.int/aixm_confluence/display/ACGOBS/Overview

ICAO
ICAO Annex 15 – Aeronautical Information Service, 16th Edition
ICAO PANS AIM – ICAO Doc 10066 – Procedures for Air Navigation Services Aeronautical Information Management, 1st Edition

ISO
ISO 19115 – Geographic Information – Metadata, 2003
ISO 19131 – Geographic information – Data Product Specification, 2007

KML OGC (05.10.2020)
https://www.ogc.org/standards/kml

12. ANNEX A: Feature catalogue for Obstacle data set (ICAO) – Austria: Excel file format

The following chapter describes the Excel file format of Obstacle Data Set (ICAO) – Austria. It shall describe the file format including obstacle feature and its attributes.

12.1. Attribute List

The following table shows all attributes provided by the Excel file format.

Nr.	Name (German)	Name (English)
1	Bundesland	Region
2	Bezirk	District
3	Standort	Location
4	Art	Type
5	Geometrie	Geometry
6	Koordinaten	Coordinates
7	Koordination (Dezimalgrad)	Coordinates (decimal degrees)
8	Vertikales Referenzsystem	Vertical reference system
9	Maximale Höhe AMSL (M/FT)	ELEV (M/FT)
10	Maximale Höhe AGL (M/FT)	MAX HGT AGL (M/FT)
11	Tageskennzeichnung	Day marking
12	Befeuert	Lighted
13	Kennung	Identifier

12.2. Attributes

Attribute Name	Data Type	Attribute Definition
Bundesland **Region**	codeList	Federal states of Austria: Burgenland, Niederösterreich, Kärnten, Salzburg, Oberösterreich, Steiermark, Tirol, Vorarlberg, Wien. A combination is possible if obstacle is located in more than one state.
Bezirk **District**	codeList	Administrative districts of Austria. A combination is possible if obstacle is located in more than one district.
Standort **Location**	string	Name of obstacle, mostly related to its location. This attribute is not necessarily unique.
Art **Type**	codeList	Type of obstacle. DO-276/ED-98 defines the obstacle type as "*a description of the recorded obstacle, e.g., tower, building, tree, power lines, windmill farms, or cable cars.*" Description from the TOD Manual: "*An indication of the type of obstacle recorded. This should be assessed against a generic set of obstacle types which includes types such as tree, building, wind-turbine, etc. This information is linked to the obstacles recorded and should, therefore, be provided at this level (data level).*"
Geometrie **Geometry**	codeList	Type of geometry: point, point (grouped), curve, surface. According to PANS-AIM, 5.3.3.2.2.1 - "*Obstacle data elements are features that shall be represented in the data sets by points, lines or polygons.*" Description from the EUROCONTROL TOD Manual: "*An indication of how the obstacle is described, in respect of whether it is a point, line or polygon (data level).*"
Koordinaten **Coordinates**	string	DD MM SS.ssss[N] DDD MM SS.ssss[E] Latitude and longitude of obstacle
Koordinaten (Dezimalgrad) **Coordinates (decimal degrees)**	float	DD.ddddddddd Latitude and longitude of obstacle

Vertikales Referenzsystem **Vertical reference system**	codeList	EVRS, ADRIA
Maximale Höhe AMSL (M/FT) **ELEV**	float	Maximum elevation above mean sea level in meter and feet. The elevation is considered at the top of the obstacle
Maximale Höhe AGL (M/FT) **MAX HGT AGL (M/FT)**	float	Maximum elevation above ground level in meter and feet. The TOD Manual explains that "*whilst the elevation of an obstacle typically comprises its height above MSL, its height above ground level should also be measured (data level). It should, however, be noted that the key information is the elevation of the obstacle and that the height above ground for an obstacle may vary depending on the position at which it is measured and an uneven ground profile.*"
Tageskennzeichnung **Day marking**	boolean	YES/NO
Befeuerung **Lighted**	boolean	YES/NO
Kennung **Identifier**	UUID	Universally unique identifier of the obstacle.

Annex 15

2.3.10 Globally interoperable aeronautical data and aeronautical information exchange models shall be used for the provision of data sets.

Note 1.— Specifications concerning globally interoperable aeronautical data and aeronautical information exchange models are contained in the Procedures for Air Navigation Services — Aeronautical Information Management *(PANS-AIM, Doc 10066).*

Note 2.— Guidance material on globally interoperable aeronautical data and aeronautical information exchange models is contained in Doc 8126.

AIXM 5.1.1
Aeronautical Information Exchange Model

BUT YOU CAN ALSO ADDITIONALLY ADD

Satisfy the end user

Annex 15

5.3 Digital data sets

5.3.1 General

5.3.1.1 Digital data shall be in the form of the following data sets:

a) AIP data set;

b) terrain data sets;

c) obstacle data sets;

d) aerodrome mapping data sets; and

e) instrument flight procedure data sets.

Note.— Detailed specifications concerning the content of the digital data sets are contained in the PANS-AIM (Doc 10066).

5.3.1.2 Each data set shall be provided to the next intended user together with at least the minimum set of metadata that ensures traceability.

Note.— Detailed specifications concerning metadata are contained in the PANS-AIM (Doc 10066).

5.3.1.3 A checklist of valid data sets shall be regularly provided.

PANS AIM Doc 10066

5.3 DIGITAL DATA

5.3.1 General provisions

5.3.1.1 To facilitate and support the use of exchange of digital data sets between data providers and data users, the ISO 19100 series of standards for geographic information should be used as a reference framework.

Note.— Guidance material concerning the use of the ISO 19100 series of standards is contained in Doc 8126.

5.3.1.2 A description of available digital data sets shall be provided in the form of data product specifications on which basis air navigation users will be able to evaluate the products and determine whether they fulfil the requirements for their intended use (application).

Note.— ISO Standard 19131 outlines the specifications for geographic data products. This may include an overview, specification scope, data product identification, data content and structure, reference system, data quality, data capture, data maintenance, data portrayal, data product delivery, additional information and metadata.

5.3.1.3 The content and structure of digital data sets shall be defined in terms of an application schema and a feature catalogue.

Note.— ISO Standard 19109 contains rules for application schema while ISO Standard 19110 describes the feature cataloguing methodology for geographic information.

5.3.1.4 The aeronautical information model used should encompass the aeronautical data and aeronautical information to be exchanged.

PANS AIM Doc 10066

5.3.1.5 The aeronautical information model used should:

a) use Unified Modelling Language (UML) to describe the aeronautical information features and their properties, associations and data types;

b) include data value constraints and data verification rules;

c) include provisions for metadata as specified in 4.2 and 5.3.2; and

d) include a temporality model to enable capturing the evolution of the properties of an aeronautical information feature during its life cycle.

5.3.1.6 The aeronautical data exchange model used should:

a) apply a commonly used data encoding format;

b) cover all the classes, attributes, data types and associations of the aeronautical information model detailed in 5.3.1.5; and

c) provide an extension mechanism by which groups of users can extend the properties of existing features and add new features which do not adversely affect global standardization.

PANS AIM Doc 10066

Note 1.— The intent of using a commonly used data encoding format is to ensure interoperability of aeronautical data exchange between agencies and organizations involved in the data processing chain.

Note 2.— Examples of commonly used data encoding formats include Extensible Markup Language (XML), Geography Markup Language (GML) and JavaScript Object Notation (JSON).

5.3.1.7 Charts, maps or diagrams should be used to complement digital data sets.

5.3.2 Metadata

Each data set shall include the following minimum set of metadata:

a) the names of the organization or entities providing the data set;

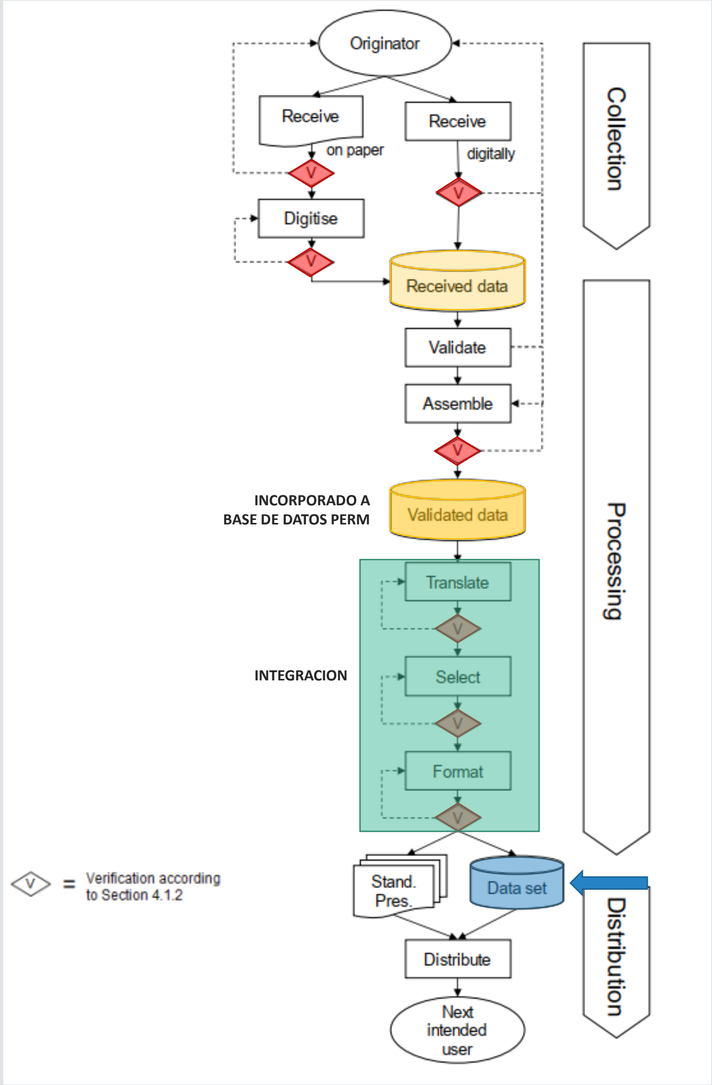
b) the date and time when the data set was provided;

c) period of validity of the data set; and

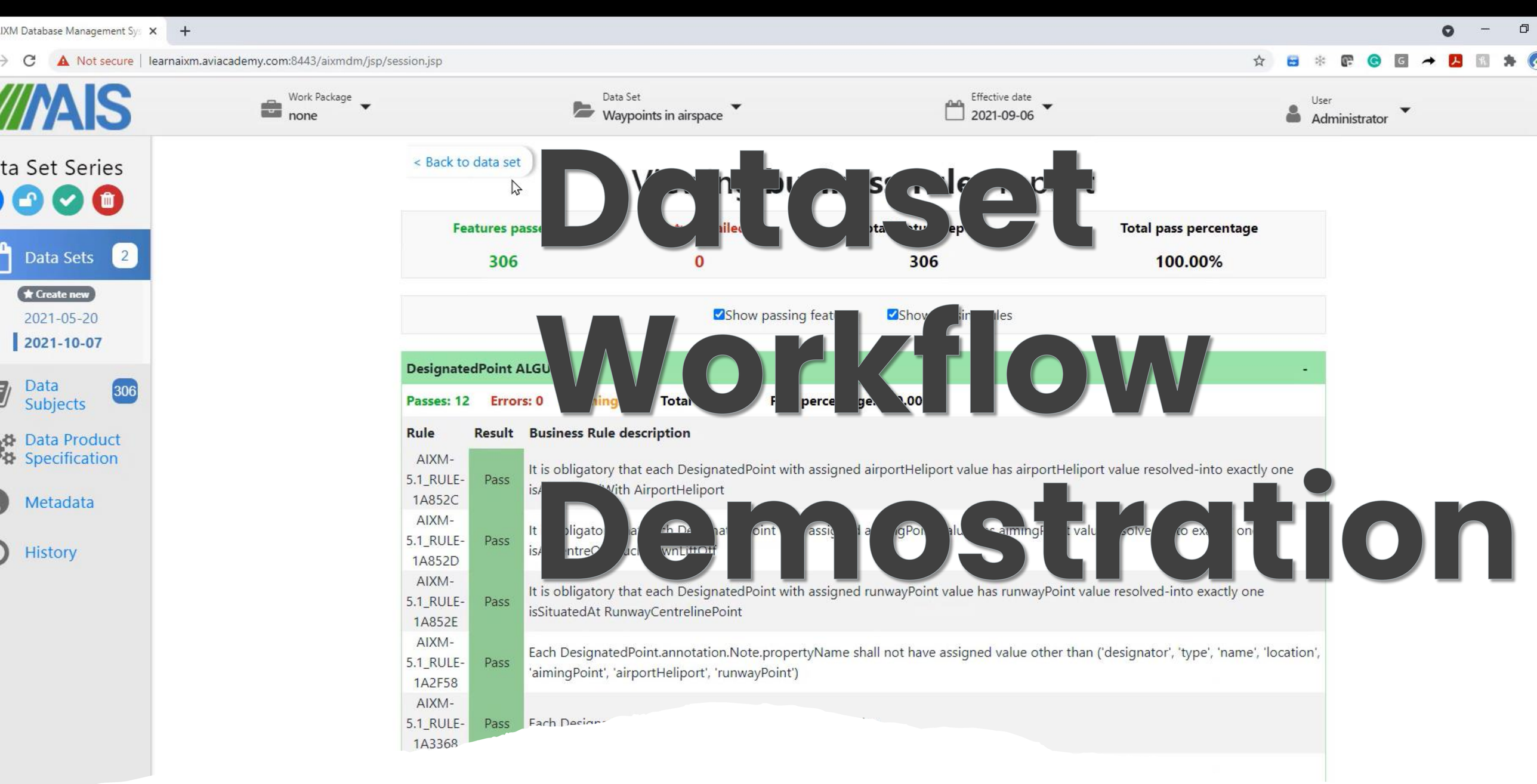
d) any limitations with regard to the use of the data set.

Note.— ISO Standard 19115 specifies requirements for geographic information metadata.

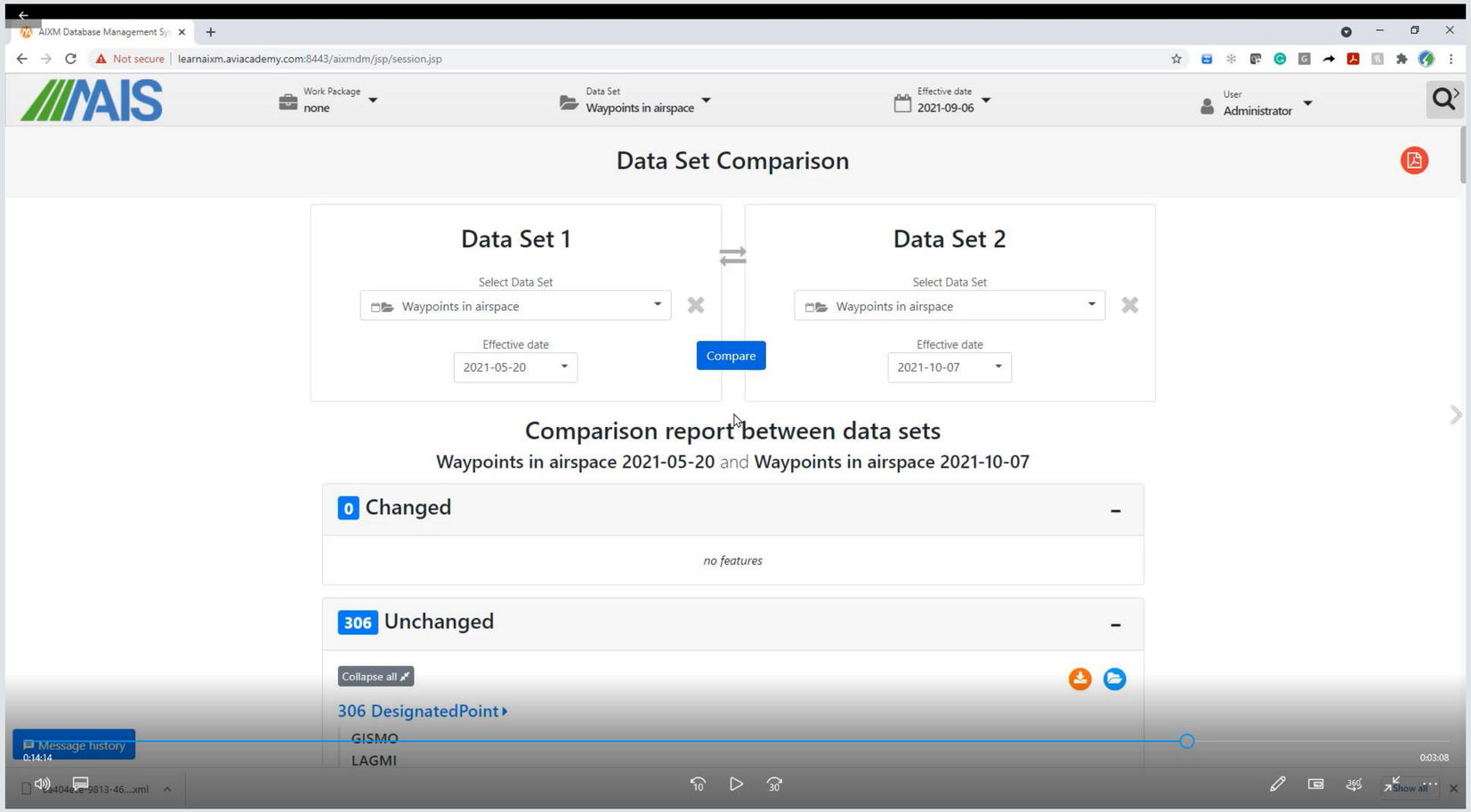
ICAO Doc 8126 7th Edition (Unedited)



Dataset Workflow Demostration



M-AIXM


AIXM Database Management Sy
Not secure | learnaixm.aviacademy.com:8443/aixmdm/jsp/session.jsp
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Data Set
Waypoints in airspace
Effective date
2021-09-06
User
Administrator
Data Set Comparison
Data Set 1
Select Data Set
Waypoints in airspace
Effective date
2021-05-20
Compare
Data Set 2
Select Data Set
Waypoints in airspace
Effective date
2021-10-07
Comparison report between data sets
Waypoints in airspace 2021-05-20 and Waypoints in airspace 2021-10-07
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LAGMI
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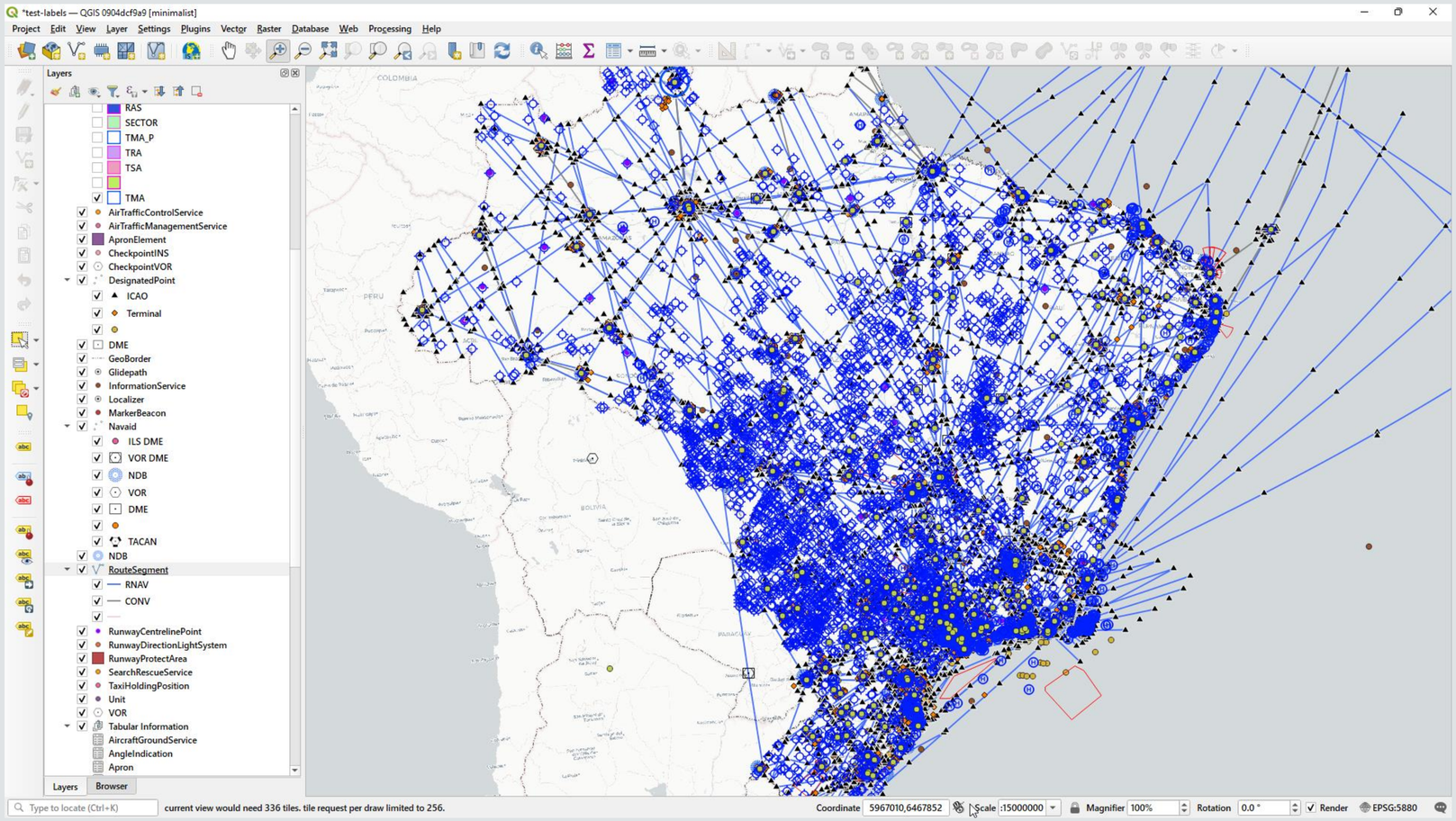
Visualizing AIXM datasets in QGIS



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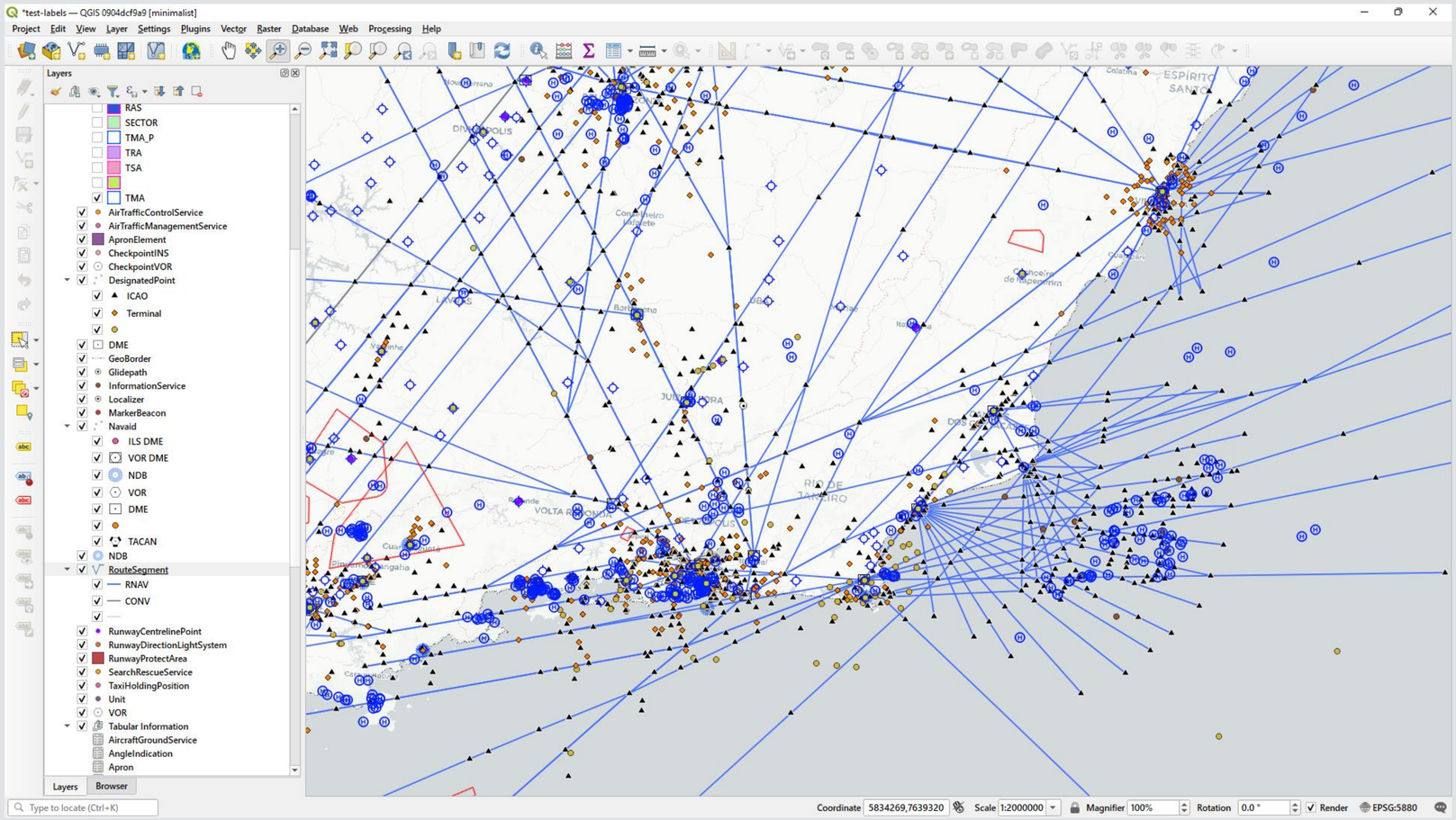

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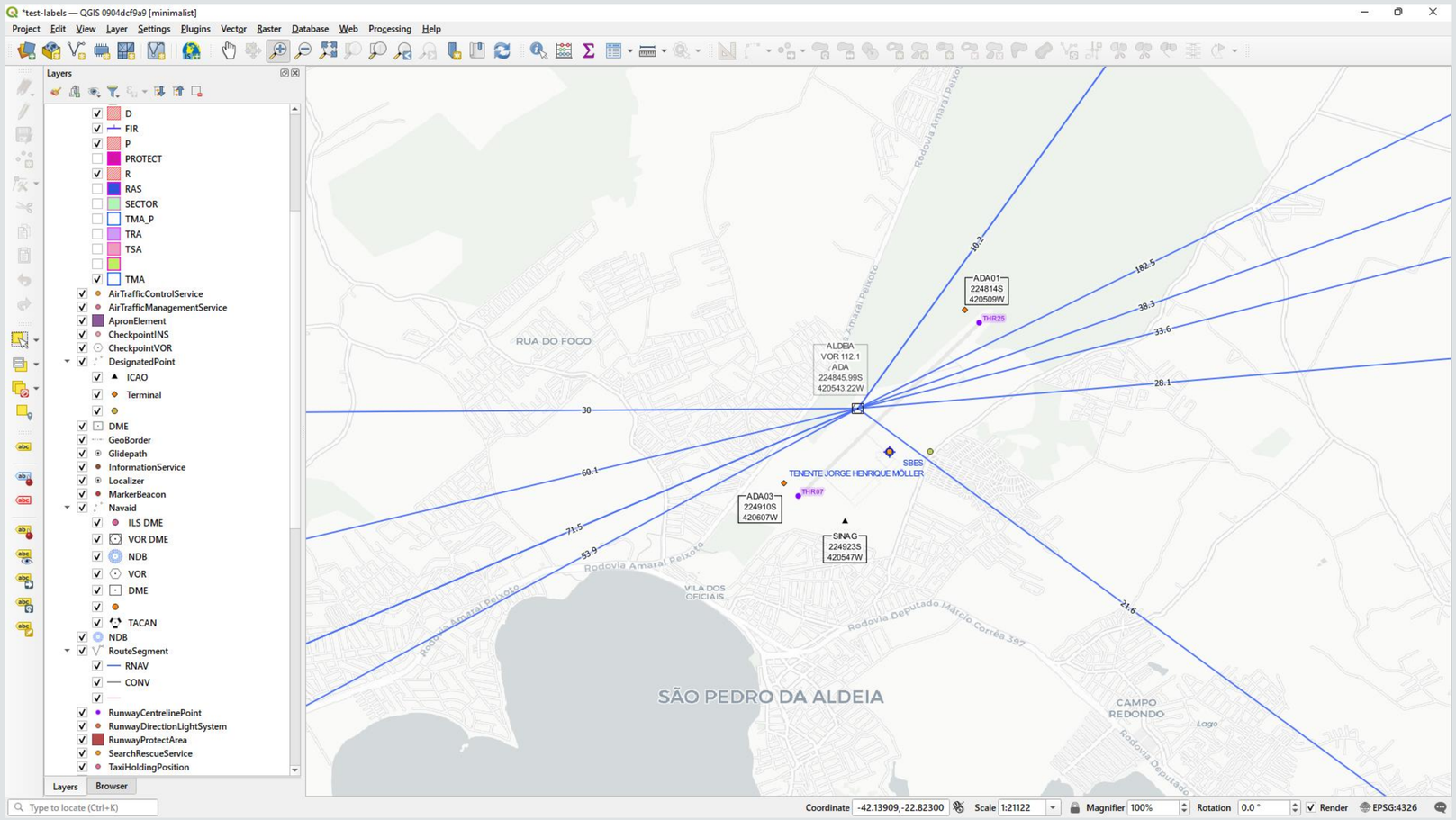
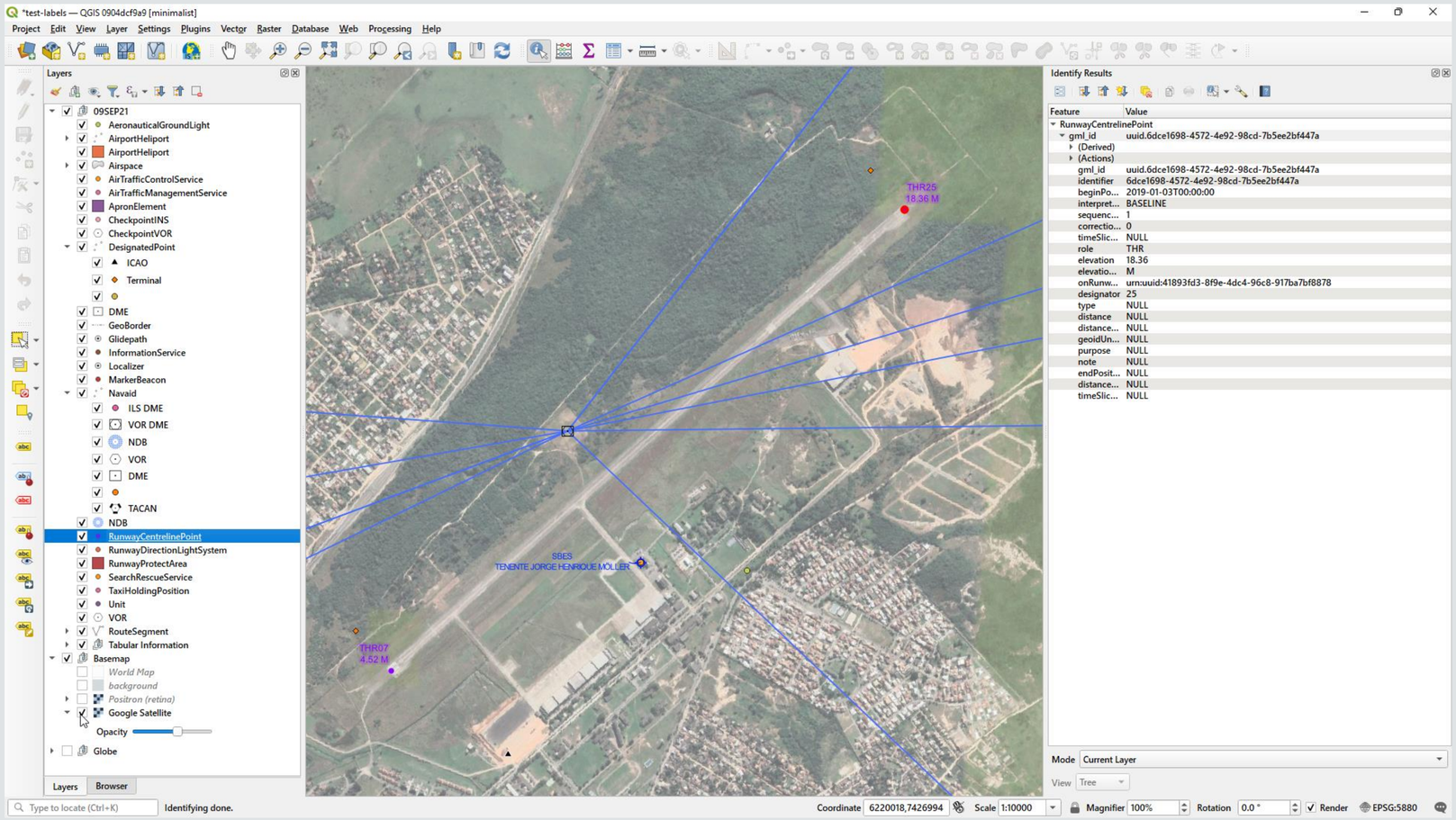
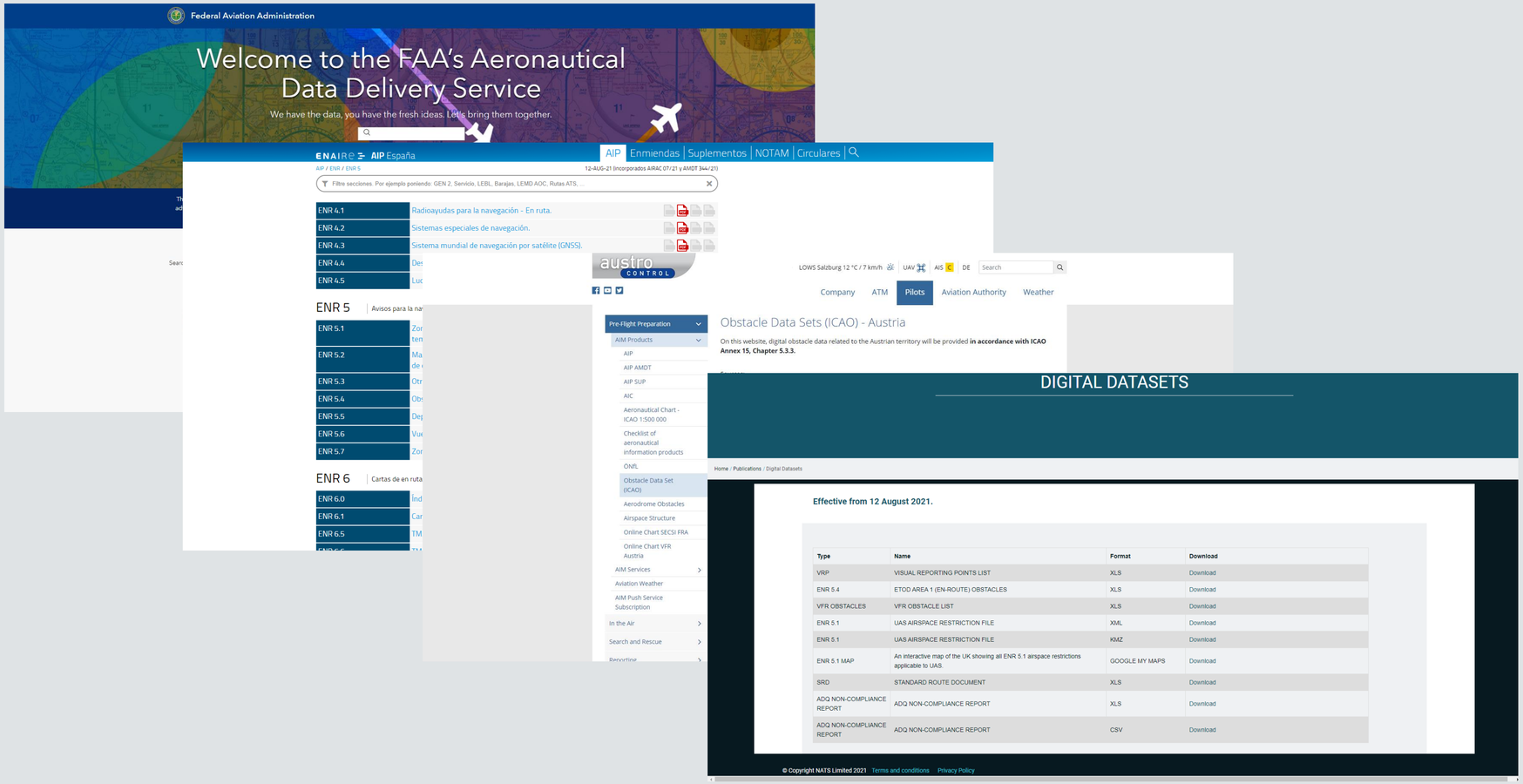


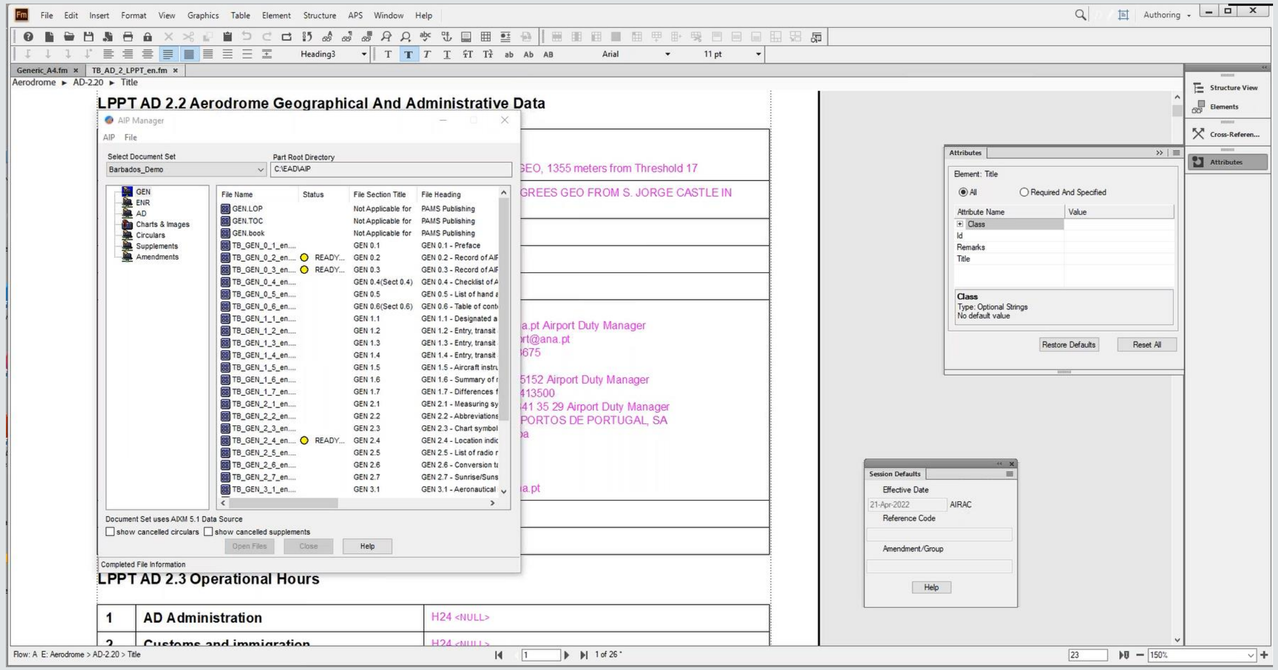
Visualizing AIXM datasets in QGIS

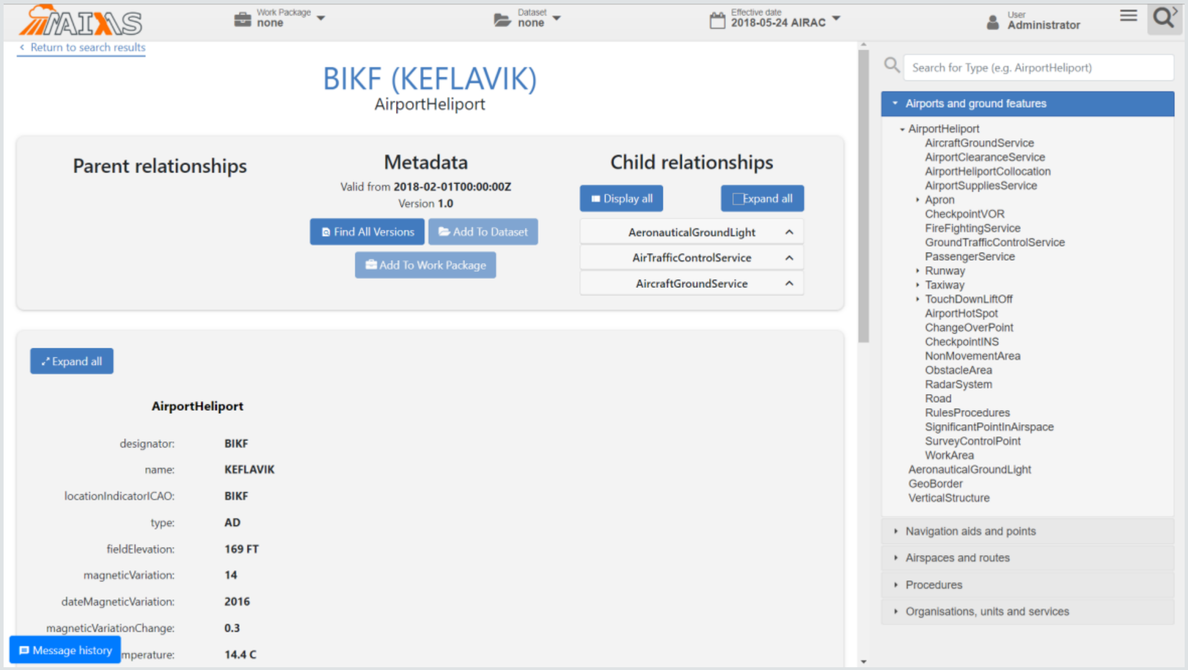


Portal Example



Software eAIP & AIXM





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Additional resources and Forum

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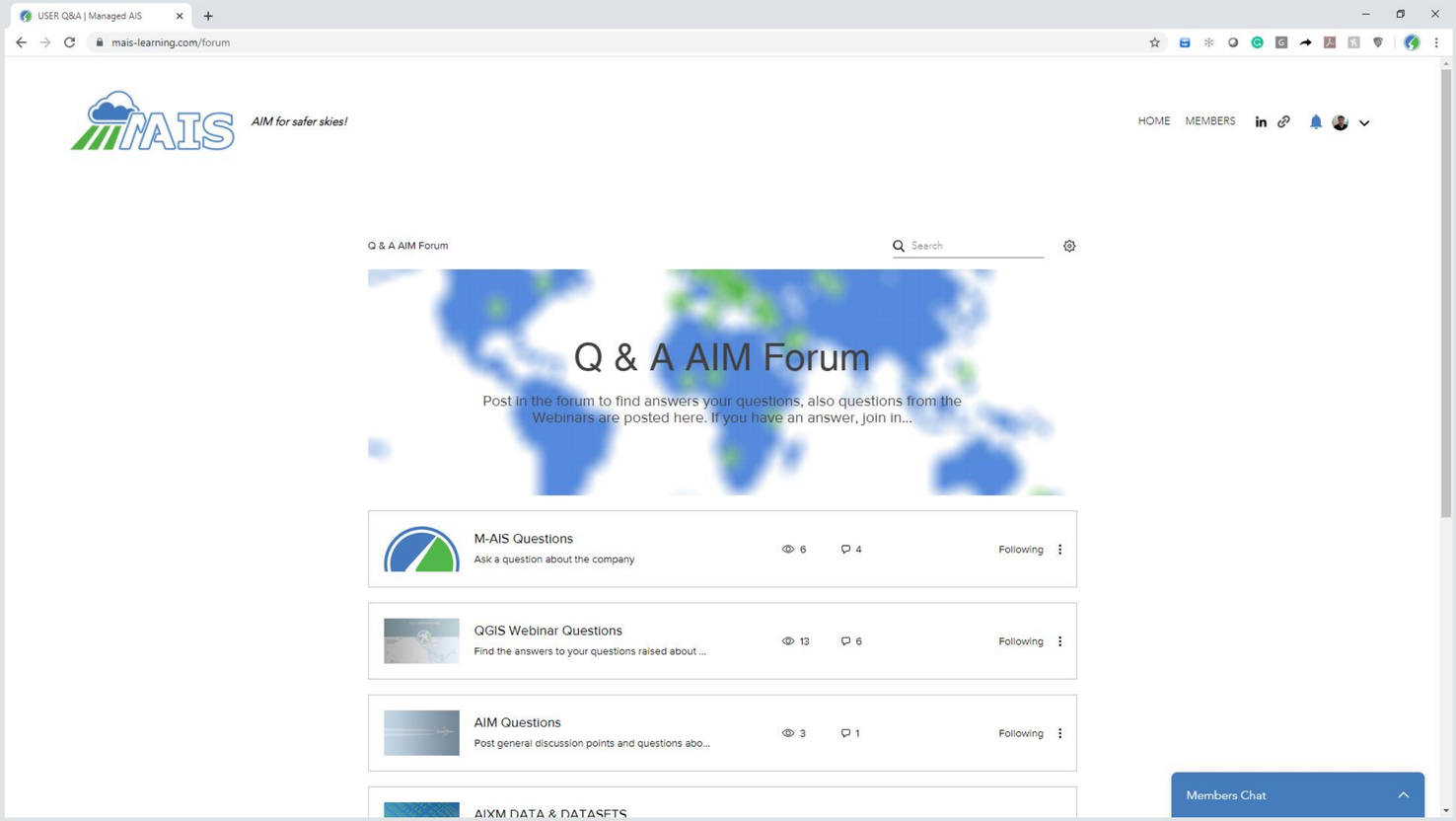

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