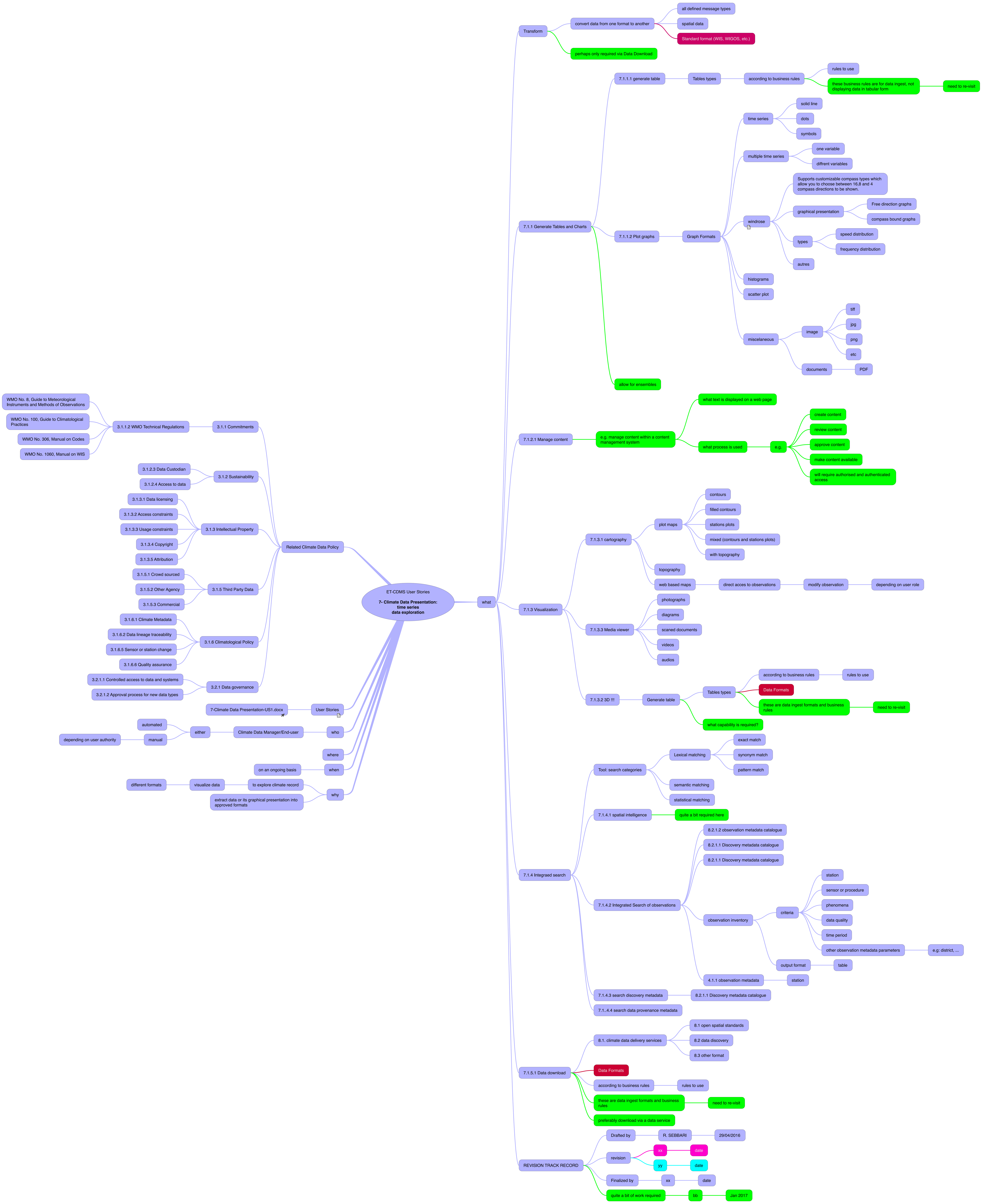
ET-CDMS User Stories
7- Climate Data Presentation: time series data exploration
what
Transform
convert data from one format to another
all defined message types
spatial data
Standard format (WIS, WIGOS, etc.)
perhaps only required via Data Download
7.1.1 Generate Tables and Charts
7.1.1.1 generate table
Tables types
according to business rules
rules to use
these business rules are for data ingest, not displaying data in tabular form
need to re-visit
7.1.1.2 Plot graphs
Graph Formats
time series
solid line
dots
symbols
multiple time series
one variable
diffrent variables
windrose
Supports customizable compass types which allow you to choose between 16,8 and 4 compass directions to be shown.
graphical presentation
Free direction graphs
compass bound graphs
types
speed distribution
frequency distribution
autres
histograms
scatter plot
miscelaneous
image
tiff
jpg
png
etc
documents
PDF
allow for ensembles
7.1.2.1 Manage content
e.g. manage content within a content management system
what text is displayed on a web page
what process is used
e.g.
create content
review content
approve content
make content available
will require authorised and authenticated access
7.1.3 Visualization
7.1.3.1 cartography
plot maps
contours
filled contours
stations plots
mixed (contours and stations plots)
with topography
topography
web based maps
direct acces to observations
modify observation
depending on user role
7.1.3.3 Media viewer
photographs
diagrams
scaned documents
videos
audios
7.1.3.2 3D !!!
Generate table
Tables types
according to business rules
rules to use
Data Formats
these are data ingest formats and business rules
need to re-visit
what capability is required?
7.1.4 Integraed search
Tool: search categories
Lexical matching
exact match
synonym match
pattern match
semantic matching
statistical matching
7.1.4.1 spatial intelligence
quite a bit required here
7.1.4.2 Integrated Search of observations
8.2.1.2 observation metadata catalogue
8.2.1.1 Discovery metadata catalogue
8.2.1.1 Discovery metadata catalogue
observation inventory
criteria
station
sensor or procedure
phenomena
data quality
time period
other observation metadata parameters
e.g: district, ...
output format
table
4.1.1 observation metadata
station
7.1.4.3 search discovery metadata
8.2.1.1 Discovery metadata catalogue
7.1..4.4 search data provenance metadata
7.1.5.1 Data download
8.1. climate data delivery services
8.1 open spatial standards
8.2 data discovery
8.3 other format
Data Formats
according to business rules
rules to use
these are data ingest formats and business rules
need to re-visit
preferably download via a data service
REVISION TRACK RECORD
Drafted by
R. SEBBARI
29/04/2016
revision
xx
date
yy
date
Finalized by
xx
date
quite a bit of work required
bb
Jan 2017
Related Climate Data Policy
3.1.1 Commitments
3.1.1.2 WMO Technical Regulations
WMO No. 8, Guide to Meteorological Instruments and Methods of Observations
WMO No. 100, Guide to Climatological Practices
WMO No. 306, Manual on Codes
WMO No. 1060, Manual on WIS
3.1.2 Sustainability
3.1.2.3 Data Custodian
3.1.2.4 Access to data
3.1.3 Intellectual Property
3.1.3.1 Data licensing
3.1.3.2 Access constraints
3.1.3.3 Usage constraints
3.1.3.4 Copyright
3.1.3.5 Attribution
3.1.5 Third Party Data
3.1.5.1 Crowd sourced
3.1.5.2 Other Agency
3.1.5.3 Commercial
3.1.6 Climatological Policy
3.1.6.1 Climate Metadata
3.1.6.2 Data lineage traceability
3.1.6.5 Sensor or station change
3.1.6.6 Quality assurance
3.2.1 Data governance
3.2.1.1 Controlled access to data and systems
3.2.1.2 Approval process for new data types
User Stories
7-Climate Data Presentation-US1.docx
who
Climate Data Manager/End-user
either
automated
manual
depending on user authority
where
when
on an ongoing basis
why
to explore climate record
visualize data
different formats
extract data or its graphical presentation into approved formats

/ET-CDMS User Stories/what/7.1.1 Generate Tables and Char.../7.1.1.2 Plot graphs/Graph Formats/windrose

A "wind rose" diagram is the most common way of displaying wind data, and can be measured in a “speed distribution” or a “frequency distribution". Wind roses can be a yearly average, or can be made for specific seasons; some even include air temperature information.

While weather data from software tools can provide a basic understanding of wind patterns, the best way to get accurate data is to perform real measurements at the site itself.
Climate data, including wind patterns, mostly comes from airports. It is often the case that the wind patterns measured at the airport are very different than the wind patterns of nearby sites. However, by understanding basic concepts of air movements, you can adjust the wind data to better suit the site location and simulate more accurate scenarios. When wind data is collected at airports, it is typically measured at 10 m (30 ft) above ground. Consider this and your terrain when designing with winds at a pedestrian level.

. The modern wind rose used by meteorologists gives the percentage of the time the wind blows from each direction during the observation period; it sometimes shows the strengths of these winds and the percentage of the time calm air or light winds are observed.

A wind rose gives a very succinct but information-laden view of how wind speed and direction are typically distributed at a particular location. Presented in a circular format, the wind rose shows the frequency of winds blowing FROM particular directions. The length of each "spoke" around the circle is related to the frequency of time that the wind blows from a particular direction. Each concentric circle represents a different frequency, emanating from zero at the center to increasing frequencies at the outer circles. The wind roses shown here contain additional information, in that each spoke is broken down into discrete frequency categories that show the percentage of time that winds blow from a particular direction and at certain speed ranges. All wind roses shown here use 16 cardinal directions, such as north (N), NNE, NE, etc.
An example is shown here. It is the wind rose for Chennai, India based on three months of hourly wind data (all hours of the day). This rose shows that the winds at Chennai during the period blow from the southeast much of the time. In fact, the 3 spokes around the southeast direction (ESE, SE and SSE) comprise 39% of all hourly wind directions. This is quickly calculated by taking the sum of the frequencies of each of these directions (13+16+10=39%). This also shows that the wind rarely blows from the northwest. These wind roses also provide details on speeds from different directions. Examining winds from the southeast (the longest spoke) one can determine that approximately 1% of the time the wind blows from the southeast at speeds between 3.6 and 7.2 kilometer per hour. Similarly, on this spoke it can be calculated that winds blow from the southeast at speeds between 7.2 and 10.8 km/hr about 3% of the time, at speeds between 10.8 and 18 km/hr about 7% of the time, between 18 and 28 km/hr about 5% of the time.
Please note the legend at the bottom of the wind rose that gives the speed categories and their associated colors.
The legend at the bottom gives additional information such as the unit (km/hr), the average wind speed for the overall hours (in this case 12.8 km/hr), and percentage of time that the winds are calm (0%), and the years and month and hours of data on which each rose was constructed.
To calculate the typical amount of time that the wind blows from a particular direction and certain speeds just multiply the respective frequency by the appropriate amount of time.

/ET-CDMS User Stories/User Stories

===== User Story =====

A Climate Data Manager requires functionality to effectively visualize climate data in graphical form and export the result or download the data used.

This funtionality will allow A Climate Data User to explore graphically the climate data stored in the database and export the result in different format or download the climate data used.

The Climate Data Manager requires functionality to allow data management staff and End-Users to:
- *generate a wide variety of tabular reports using the climate data stored in the database*
- *generate a large variety of graphs using graphical representation of climate data or other data generated from them using for example statistical techniques. (e.g: windrose)*
- *generate different maps over selected areas (e.g: country) using spatial statistical analysis including topography*
- *display various media stored in the database such as video and photos (e.g: station photos)*
- *export/print the generated graphs/maps in different formats*
- *download the climate data/processed data used to produce the reports (tabular, graphs or maps) into different formats*
- *conduct an integrated search of the climate database or the observations metadata catalogue or the discovery metadata catalogue or the provenance metadata catalogue using different search categories and parameters.*
- *allow data management staff to modify/correct a database observations record by linking the graphical visualisation to the climate database where possible and appropriate (e.g: from a time series plot); and keep the changes.*
-
-

This component will need to ensure:
- that the integrity of the Climate Database and climate data is protected; and
- keep metrics relating to the overall status of the data rescue activity.

===== end =====
===== Data Rescue User Story =====
A Climate Data Manager requires functionality to digitally capture historical climate data and associated climate observations metadata and to enter this information into the Climate Database.

This information is required to ensure that long term climate patterns can be understood and that historical climate data can be used to help quality assure new climate observations.

Historical climate data comes in many forms, from paper observation forms, field books, station records through to microfiche and a range of graphical forms such as a thermograph or Campbell-Stokes sunshine recorder.

The Climate Data Manager requires functionality to allow data management staff to:
- scan and store images of the historical climate data forms etc;

```
•   capture the data stored on these forms using a variety of methods including optical character recognition, chart digitisation and key entry, as appropriate for each form;
•   create and modify customisable forms that can be adjusted to suite the form being digitised with fields validated for content at the time of data entry;
•   undertake key entry, with data validation and automatic calculation of required summaries and values as appropriate;
•   support data key entry of the same form by multiple key entry staff and flag differences for the climate data manager to resolve;
•   record the context under which the climate observations were made using the <u>'Manage Climate Metadata'</u> component;
•   record the provenance of the climate record and climate observations metadata digitised, including establishing a link to the scanned image of the original paper media etc;

•   allow data rescue staff to view and validate both the original form, together with the values entered into the <u>Climate Database</u> for that form; and
•   The Climate Data Manager will require an over−ride to allow a supervisor to corret errors as appropriate, recording the provenance of such changes.
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This component will need to ensure:
- that the integrity of the Climate Database and climate data is protected;
- that only authorised staff can undertake Climate Data Rescue activities;
- authorised data entry staff can only modify records that have been captured via the Data Rescue component, and not modify other records in the Climate Database; and
- keep metrics relating to the overall status of the data rescue activity.

===== end =====

A Climate Data Manager requires functionality to ingest climate data into the Climate Database and when required to extract that data.

Data Ingests operate in accordance with defined Business Rules and may be run either manually, or as scheduled tasks with support for automated, self recovery.

Each data ingest has functionality to:
- ingest a range of data types, including WMO Traditional Alphanumeric Format and Table Driven Code Format; Automated Weather Station observations; spatial data; and a range of historical and emerging data types.
- address a range of Intellectual Property, Data Provenance, Observations Metadata and related issues.
- where appropriate, perform limited Quality Management Consistency Checks on each message and define the initial quality assurance flag for each record based on that assessment.
- import atmospheric climate observations data and observations metadata from selected Climate Data Management Systems.Functionality is also required to:
- transform data from one data type to another
- extract climate data into defined WMO Data Products and also into a limited subset of other data types, dependent on the context of the data.