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Intro to Met Ocean Domain WG
or
(MetOcean thinks GIS rubbish, until recently)

105th OGC Technical Committee

Palmerston North, New Zealand

Chris Little, UK Met Office, Chair Met Ocean DWG

Wednesday 6 December 2017

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Introduction

- Met Ocean Domain WG history

- OGC-WMO MoU

- Met Ocean DWG work and strategies

- Technical challenges for geospatial

- WMO / Met Ocean DWG Interests & Progress

- Questions & Answers

Met Ocean Domain Working Group - 1

- Regular biennial ECWMF Operations Workshop, 2007:

  – recommended workshop/conference on GIS (for ops, not customers)

- Workshop - Use of GIS/OGC Standards in Meteorology:

  – ECMWF, 2008-11-24/26

  – Review use of OGC standards in geo-sciences in Europe & worldwide

  – Promote collaboration between meteorological services in order to define a set of common standards that will enhance interoperability

  – Recommended involvement in OGC and establish Met Domain WG

  – Established major theme: **Web Map Services interoperability for National Met Services**

Met Ocean Domain Working Group - 2

- Météo-France joined OGC 2007, UKMO 2008

- At OGC Tech Conf, Athens, 2009-03:

  – Meteorology DWG established, following David Lemon's work:

  – Hydrology DWG also established

- At OGC Tech Conf, Darmstadt, 2009-09:

  – Meteorology DWG converted itself to

    • Meteorology & Oceanography DWG

    • Stopped separate Climatology DWG

  – Environmental System Science DWG well established

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Met Ocean Domain Working Group - 3

- OGC and WMO signed MoU 2009-11 (Met, Ocean, Hydro)

  Short legal doc, flexible Annex, lightweight – let experts get on with work

- 2nd Workshop - Use of GIS/OGC Standards in Meteorology

  Toulouse, 23-25 November 2009

  Established second major work theme: **Conceptual modelling**

  Third workshop planned Exeter 2010, Observations theme

- 3rd Workshop - Use of GIS/OGC Standards in Meteorology

  Exeter, 15-27 November 2010

  Progressed previous work, re-established Interoperability Experiments,

  SLD/SE (weather & Aviation symbols) started, obs got nowhere

  Fourth workshop planned: Washington/Boulder/Offenbach?

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Met Ocean Domain Working Group - 4

- 4th Workshop - Use of GIS/OGC Standards in Meteorology

    Reading, 4-6 April 2013

  WMS further work:

    Implementation testing, extend to Profile or Standard

    Extend for climatological time

    Support WMS2.0 (now in abeyance)

  Conceptual Modelling:

    Aviation more or less finished

    Another domain starting (climatology?)

    Time Model needed (Temporal DWG started: leap seconds, Gregorian calendar start, heliocentric coordinates, climatological periods)

    SLD/SE GitHub symbols need styling and linking to real WMO registry

  WCS 2.0 Extensions:

    Appl. Profile, 4D+, not 2D+Layers, ensembles, time, 'corridors', tiles

    Encoding formats GRIB2 TBD

    Data tiling TBD may be separate standard

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OGC-WMO Memorandum of Understanding

- Signed 23 November 2009

- Compromise between:

  – WMO-No. 60: Basic Documents No. 3 2002 edition

    ftp://ftp.wmo.int/Documents/MediaPublic/Publications/Policy_docs/060E.pdf

  – Standard OGC MoU terms

- 'Umbrella' MoU over organisations, encompassing:

  – OGC Met Oceans DWG and Hydrology DWG

  – all WMO Commissions:

      CBS, CHy, JCOMM, CCI, CIMO, CAeM, CAgM, CAS

- Short legal document, with flexible Annexe

- Lightweight – let experts get on with the work

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Met Ocean DWG work

Wiki (open) http://external.opengeospatial.org/twiki_public/MetOceanDWG/WebHome

Mailing list (open) meteo.dwg@lists.opengeospatial.org

Teleconferences most / many Wednesdays, 15:00 - 16:00 UTC

- WMS Best Practice, retrofit WMS 1.3:
  – TIME
  – Climatological Periods & Time
  – Vertical Coordinates, ELEVATION
  – Coordinate Reference Systems CRS (being tackled in other groups)
  – Customer / User orientated, so no Met traditional terminology

- SLD/SE wiki and GitHub https://github.com/chris-little/WorldWeatherSymbols
- Conceptual Modelling
  – Based on O&M
  – Jeremy Tandy leading, driven by Aviation, but long term
- WCS, new WCS 2.0
- Extra 3rd Co-Chair

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Challenges for OGC standards in Meteorology

- Long history of interoperability at human/paper level
- Spatial & Temporal, 2D, 3D, 4+D, constantly changing
- Not MBytes, but GB, TB and PetaBytes of data daily.

- Irregular time intervals
- Timescales: hours,.., seasons,.., centuries, + & -
- Multiple Time attributes

- 'Regular' grids are not always regular
- Continual change of coordinate systems & projecting
- Lagrangian vs. Eulerian viewpoints (*on train or platform?*)

- Vertical coordinates
- Cross-sections, height-time diagrams, T/φs, etc

- Ensembles: probabilistic distributions

- Significant 'Objects', features of interest

OGC Strategies

- 'Old Guard' "2D world" vs 'New Guard' "4D+ world"
- Restructuring standards in to Core + Extensions
- Moving from KVP Client/Service API to RESTful http based
- Keep using Interoperability Experiments and Test Beds
- Scenario and Use Case driven
- Establishing naming, registries & validation chains with URIs
- Expanding from US based to European to global
- Expanding out of traditional GIS communities

- Opened up Wikis, Mailing lists in response to MetOceanDWG

- Follows the money!

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WMO / Met Ocean DWG Interests

- WMS – Currently Proactive
  - Time & Elevation Best Practice defined. Successful plugfest held
  - Ensembles Best Practice to be approved this week
  - Map Projections – changes to existing repositories in progress
  - SLD/SE – Aviation SigWx and standard WMO Plots Use Cases - moribund
  - Tiling – WMTS separate standard – jigsaw edges – stationary!
- Conceptual Modelling - Currently Proactive
  - WXXM for Aviation first version finished
- SVG Weather & SigWx symbols on GitHub, WMO will reference
- WCS - Currently Proactive
  - 4D, CRS,
  - payload formats, NetCDF done, GRIB2 in pipeline
  - vector vs raster
- CSW – compatible OpenSearch but not ISO23950 - Currently Reactive
- O&M, SWE, IoT increasing in importance - Currently Passive
- WKT for Calendars - Currently Proactive
- TimeseriesML1.0 – finished – but started again for V1.2

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WMO / Met Ocean DWG currently NOT* Interested

- GeoXAMCL – security at detailed feature level
- CityGML – city and building modelling
- OpenLS - Location Services / Mobile phones
- WPS - Web Processing Service ? Being explored
- 3D and Augmented Reality ?? Some activity
- GeoSMS ? Some interest
- Etc

* Or rather: no critical mass of interested volunteers

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Met Ocean DWG: Some Interesting Domain WGs

Active dialogues

- Aviation
- Catalogues
- Co-ordinate Reference Systems
- Coverages
- Defence & Intelligence
- Emergency & Disaster Management
- Health
- Hydrology
- Metadata (Discovery, not Interpretation)
- UxS

Not currently Active

- Data Preservation
- Decision Support
- Earth Systems Science
- Location Services
- Mass Market
- Sensor Web Enablement

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Met Ocean DWG future work priorities

- Work on Met Ocean aspects of WCS2.1 extension proposals

- Follow GeoTIFF WCS shortcut process with WMO GRIB format (done)

- Develop WCS Data Tile standard (second thoughts)

- Extend WMS1.3 BP to other standards (WMTS… Other than WCS 2.0)

- Extend the BP towards a Profile (e.g. Defence?)

- Expand WMS1.3 BP with climatological periods, calendars, etc

- Express Requirements/Change Request to WMS2.0 (now back to 1.4)

- Improve weather symbols in SVG, & styles, for SLD/SE on Github

- Interact more with the on Aviation DWG for Met

- Influence or use other OGC standards e.g. O&M, PubSub, WPS, etc

- Work on WMO Registries, Vertical & Temporal CRSs, etc

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OGC Met Ocean DWG Summary

OGC:

- is becoming global, rather than American
- has opened up processes to community groups
  - Wiki, mailing lists
- is updating standards from client/server to RESTful
- Is restructuring standards to a 'Core & Extensions' model
- In middle of '2D+Layers' versus '4D+slice & dice' churn
- Interoperability Experiments and Test beds are still heavyweight, to protect members' IPR
  - Not an issue for Met Ocean community
- Has taken on Met Ocean requirements in key standards, even when Met Ocean people not actively involved
- More volunteers and experts needed

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Met Ocean DWG Summary

Members: UKMO, M-F, DWD, ECWMF, EUMETSAT, FMI, KNMI, met.no, met.ro, CMC, NOAA, BoM, (JMA, KMA, ??)

- WMS Time & Elevation, Ensembles Best Practices defined, being implemented

- Consistency between WMO, ICAO and OGC conceptual models achieved

- WCS 2.1 Extensions, GRIB data payload

- Temporal: TImeSeriesML, Ontology, more to come

- Non-WMO observations are increasingly important, so **OGC observation standards** becoming important

- Interests moved out of Met Ocean DWG to other WGs

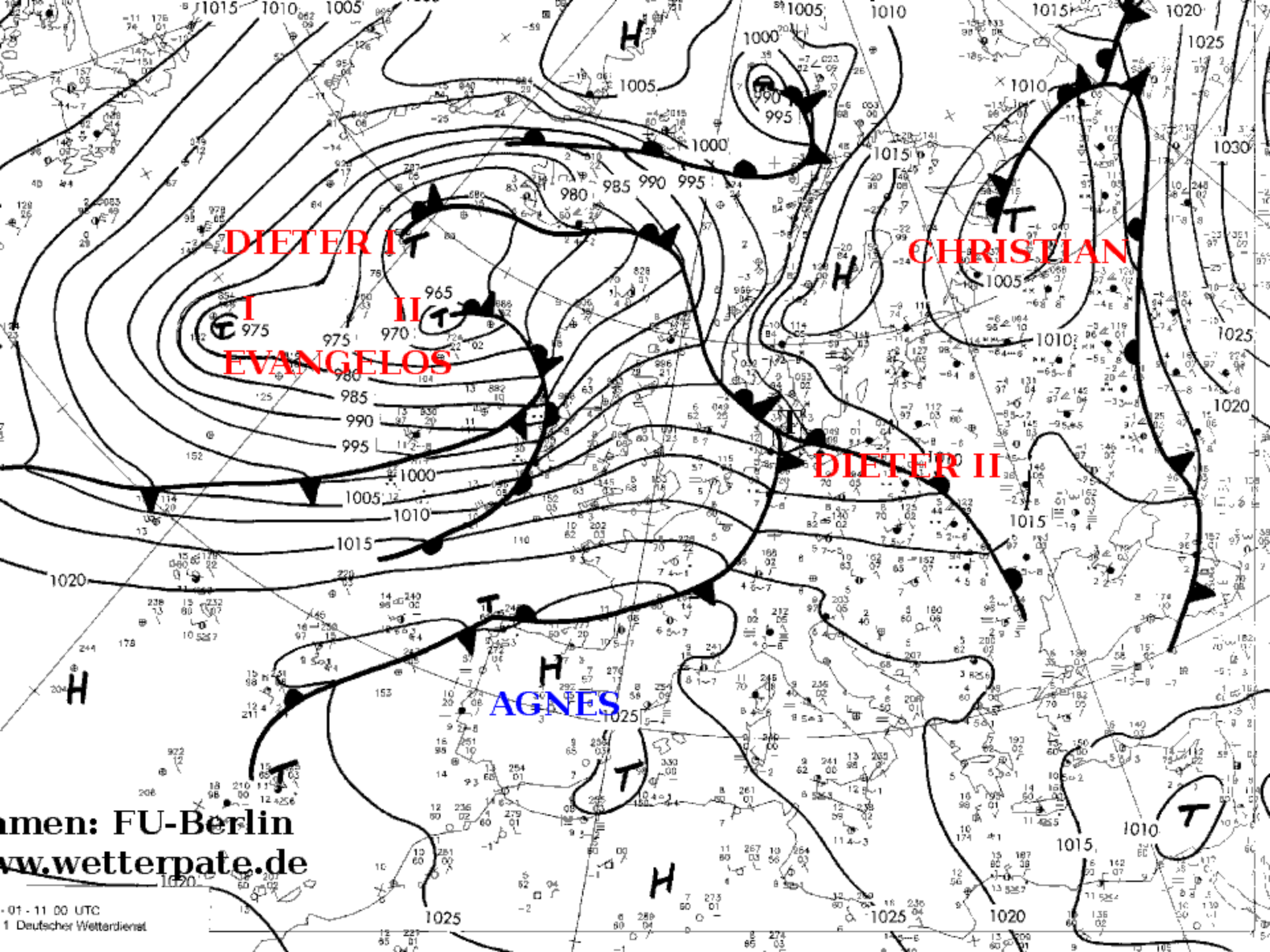- Lots of work, increasing importance – join in!

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Met Ocean DWG Attendance
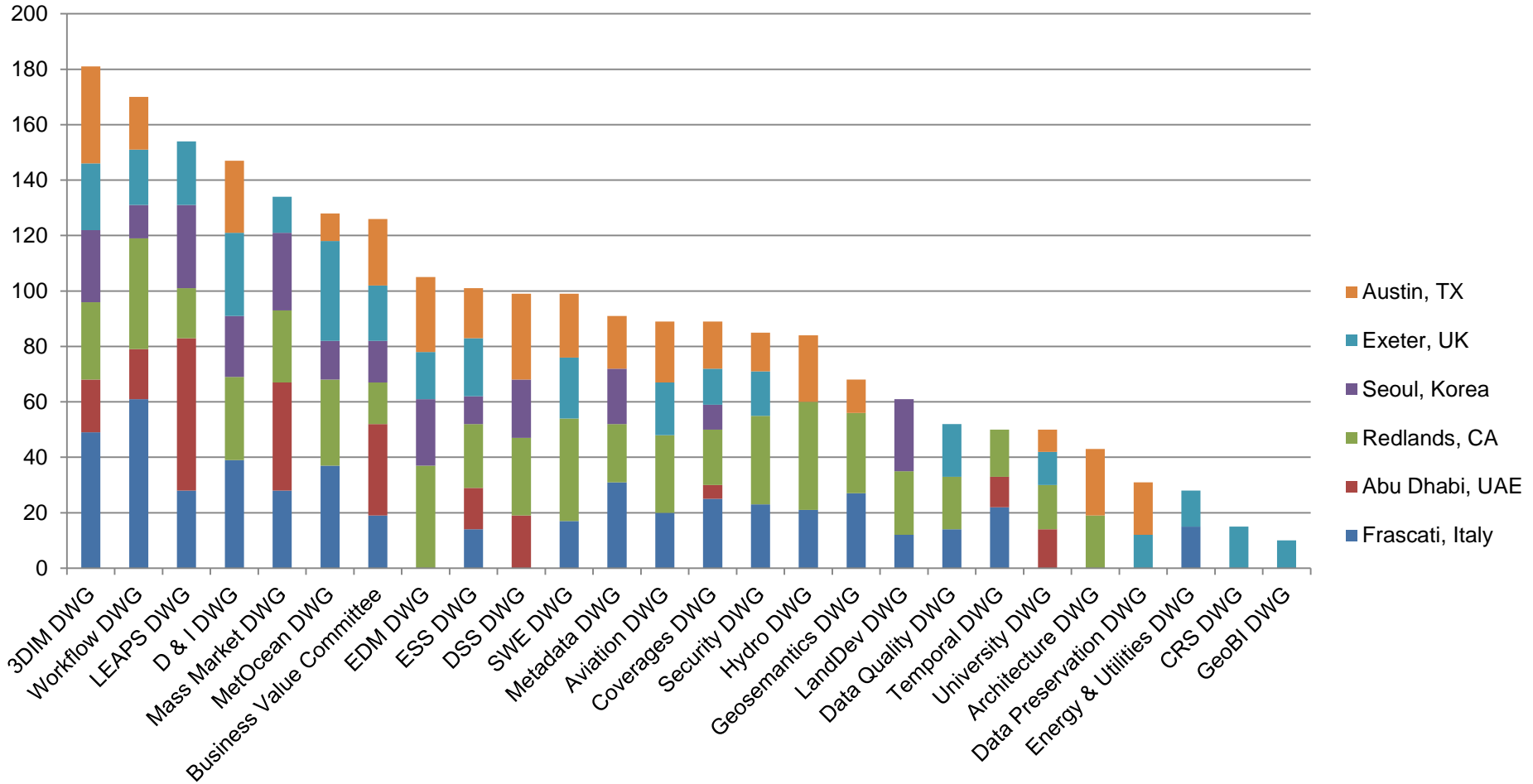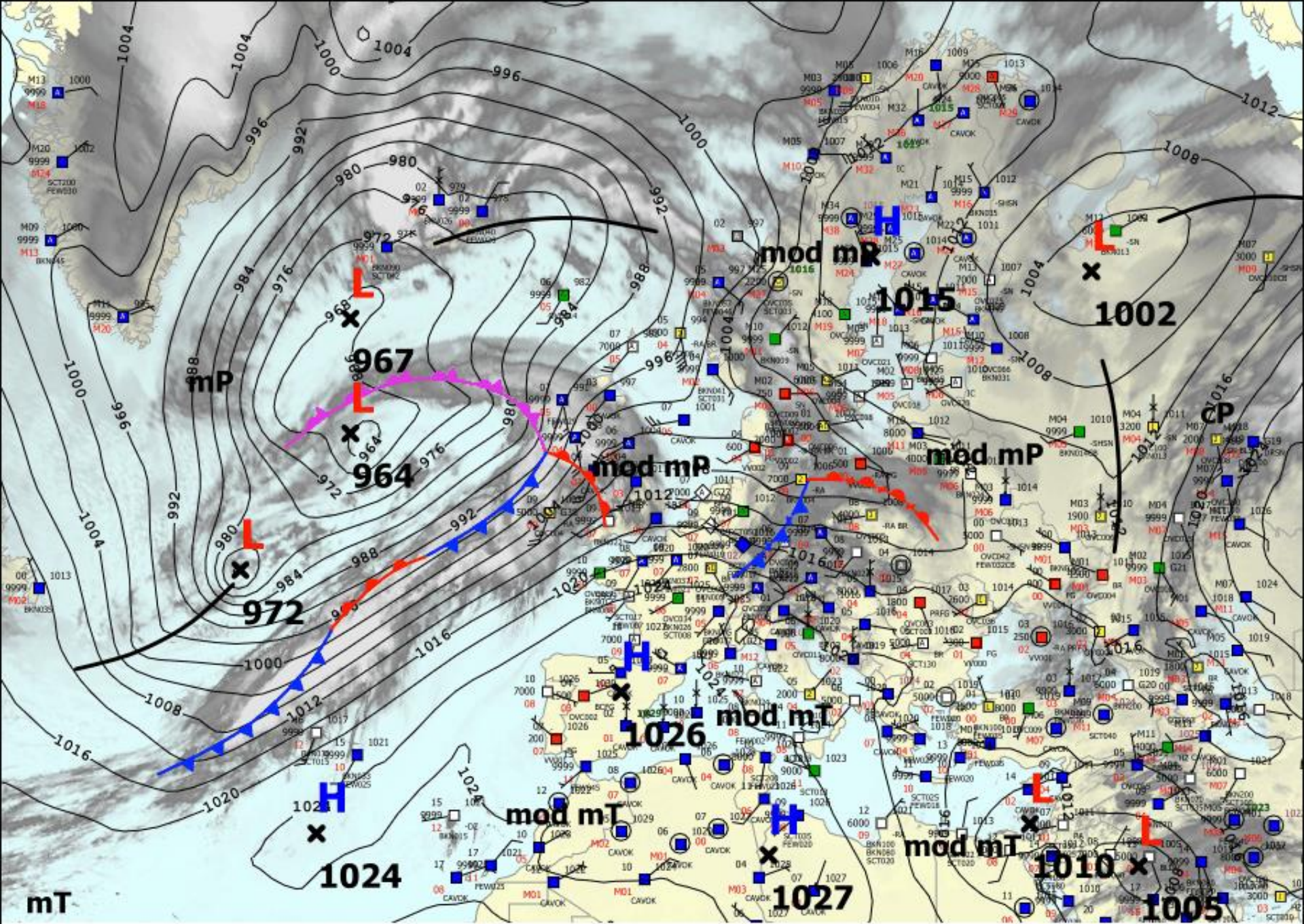
Met Ocean DWG

- Questions and Answers?

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DIETER I

CHRISTIAN

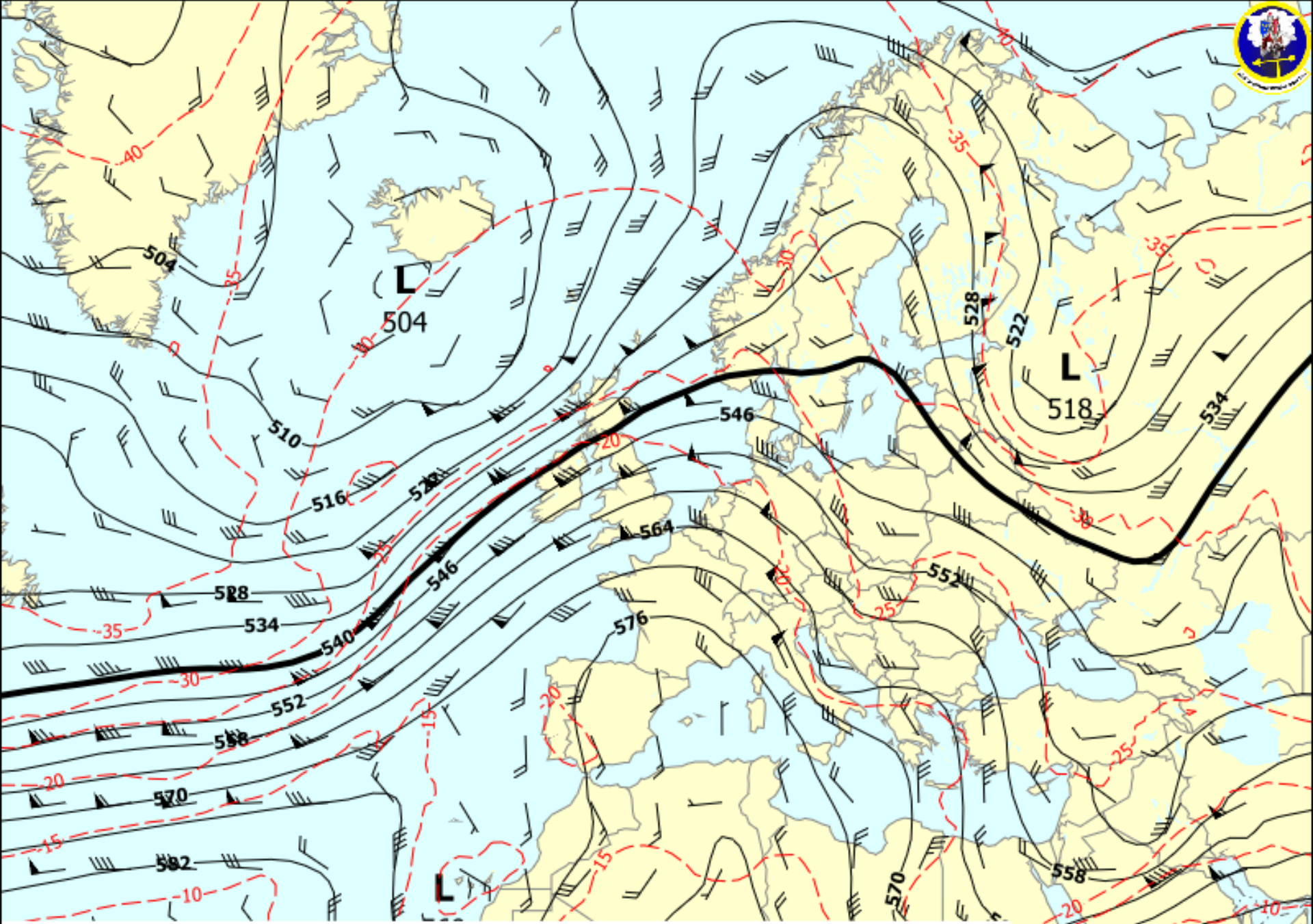EVANGELOS

DIETER II

AGNES

Namen: FU-Berlin

www.wetterpate.de

01 - 11 00 UTC
Deutscher Wetterdienst

SURFACE ANALYSIS
VT: 15 JAN 00Z POSTED AT: 15/0038Z

L - LOW PRESSURE   ▲▲▲ -COLD FRONT
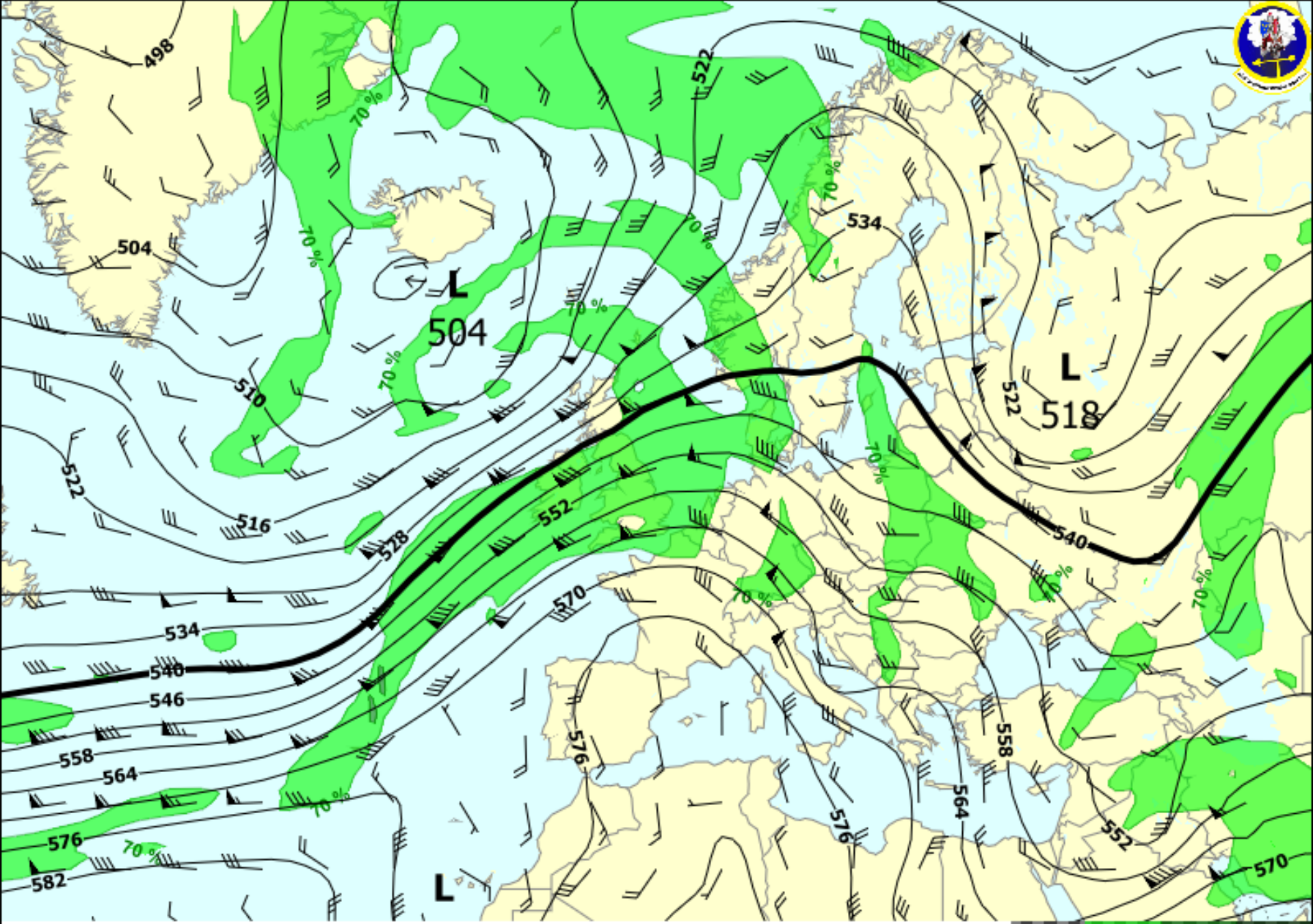H - HIGH PRESSURE   ▼▼▼ -STATIONARY FRONT

WMO Present Weather Symbols

500MB GPH | TEMPERATURES | WINDS VT: SAT 15 JAN 12Z (T+12)
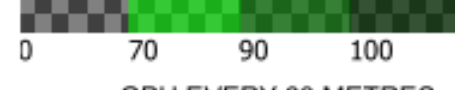**UKMO GLOBAL MODEL 15/00Z**

TEMPERATURE 5 DEG C

500MB GPH | RH | WINDS VT: SAT 15 JAN 12Z (T+12)
UKMO GLOBAL MODEL 15/00Z

| 0 | 70 | 90 | 100 |

PGCE05 EGRR 191200

Sakurajima
31.6N 130.7E

Etna
37.7N 15.0E

H 400

ISOL EMBD CB 300 XXX
ISOL EMBD CB 260 XXX
ISOL EMBD CB 270 XXX
ISOL EMBD CB 450 XXX
ISOL EMBD CB 320 XXX

290 L
240 L
270 L

FL270/350
FL270
FL280
FL330
FL380 200/550
FL380 080
FL320
FL310
FL320
FL360
FL360 210/460
FL360 480 290/480
FL410 250/500
FL410

350 300 290 400 450 270

CAT AREAS

1	490 XXX	4	330 XXX	7	360 260		
2	380 270	5	340 XXX	8	OCNL 360 250		
3	400 XXX	6	500 300				

PGCE05 EGRR 191200

Sakurajima
31.6N 130.7E

H 400

Etna
37.7N 15.0E

ISOL EMBD CB 300 XXX

ISOL EMBD CB 260 XXX

ISOL EMBD CB 270 XXX

ISOL EMBD CB 450 XXX

ISOL EMBD CB 320 XXX

350 350 350 350 350 350 350 350 350 350 350 350 350 350 350 350 350 350 350
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FL360
FL360 210/460
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FL360 480
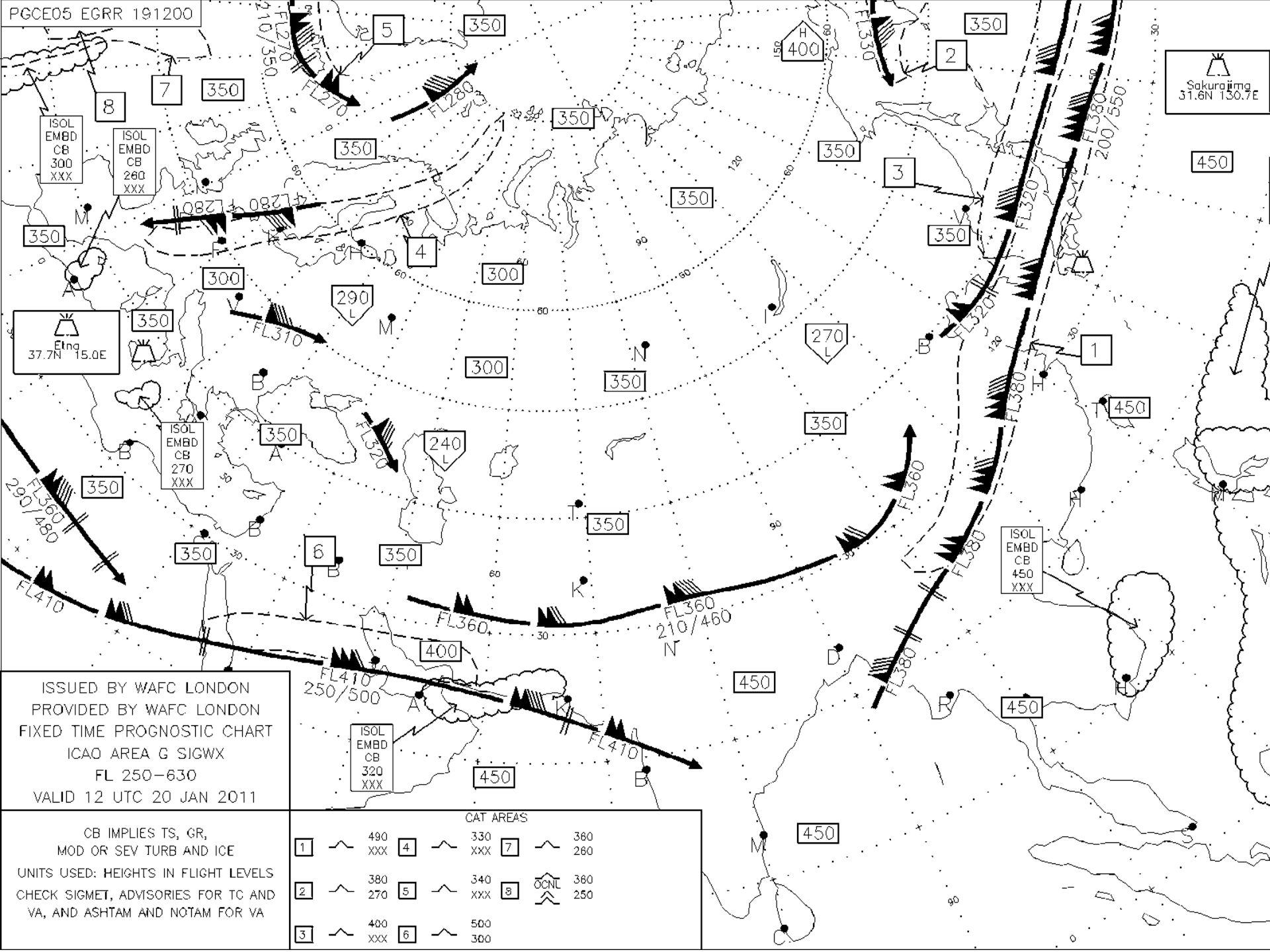FL410 250/500
FL410

5 7 8 4 2 3 1 6

ISSUED BY WAFC LONDON
PROVIDED BY WAFC LONDON
FIXED TIME PROGNOSTIC CHART
ICAO AREA G SIGWX
FL 250-630
VALID 12 UTC 20 JAN 2011

CB IMPLIES TS, GR,
MOD OR SEV TURB AND ICE

UNITS USED: HEIGHTS IN FLIGHT LEVELS

CHECK SIGMET, ADVISORIES FOR TC AND
VA, AND ASHTAM AND NOTAM FOR VA

CAT AREAS

1	490 XXX	4	330 XXX	7	360 260
2	380 270	5	340 XXX	8	OCNL 360 250
3	400 XXX	6	500 300		

OGC-WMO MoU Outcomes

Key WMO role-players identified

- WMO Secretariat Information Systems Branch
- Experts representing the following Technical Commissions to liaise with OGC Met Ocean- and Hydrology DWGs
  - Commission for Basic Systems (CBS)
  - Commission for Instruments and Methods of Observation (CIMO)
  - Commission for Climatology (CCl)
  - Commission for Hydrology (CHy)
  - Joint WMO-IOC Commission for Oceanography and Marine Meteorology (JCOMM)
  - One CBS expert to liaise with above mentioned experts

Coordination of WMO and DWG activities

- Establishment of a WMO-OGC coordination team consisting of WMO and OGC nominated experts and co-chairs of DWG (Proposal to be confirmed by OGC)

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OGC-WMO MoU Outcomes (continued…)

Addressing WMO requirements

- OGC-WMO coordination team to ensure that the requirements expressed by WMO Programmes are appropriately acknowledged within DWG activities

Reporting structures

- Reporting between OGC and WMO through OGC-WMO coordination team
- WMO lead Technical Commission should be CBS
- WMO internal reporting through nominated coordinator and experts

Synchronization of DWG activities

- Joint meetings
- Identification of areas of cooperation (e.g. joint IEs)

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- 🔧 Preferences

Webs
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- AviationDWG
- BigDataDwg
- BusinessValueCommittee
- CATdiscuss
- CDBswg
- CRSdefinitionResolver
- ClimateChallenge2009
- CoveragesDWG
- EUforum
- EarthCube
- EnergyUtilitiesDwg
- GML
- GeoSciMLswg
- HealthDWG
- HydrologyDWG
- I15swg
- ILAFpublic
- Ideas4OGC
- JSONsubGroup
- JapanAssistance
- MLSdwg
- Main
- MassMarket
- MetOceanDWG
- NREwg
- NetCDFu
- NordicForum

You are here: OGC Public Wiki > MetOceanDWG Web > WebHome (09 Jun 2016, ChrisLittle)

Edit   Attach

Welcome to the MetOceanDWG web

The Meteorology and Oceanography Domain Working Group (Met Ocean DWG) is a community orientated working group of the Open Geospatial Consortium (OGC). The group does not directly revise OGC standards, but rather enables collaboration and communication between groups with meteorological and oceanographic interests. The Met Ocean DWG maintains a list of topics of interest to the meteorological and oceanographic communities for discussion, defining feedback to the OGC Standards Working Groups (SWG), and performing interoperability experiments. The DWG covers Oceanography as well, because of the long history of collaboration and shared institutions between meteorology and oceanography. Climatology is, of course, a subset of Meteorology.

The Met Ocean DWG is intended to be a public forum for communication, and both the email list and this Twiki are open to interested parties.

- **Charter :** Please see the current Met Ocean DWG Charter. *(The original charter is at Meteo DWG Charter)* .
- **Twiki :** Anyone can edit this wiki, but, of course, responsibly. Instructions can be found on the TWiki Text Formatting Rules page.
- **Email list :** Subscribe to the public email list at : https://lists.opengeospatial.org/mailman/listinfo/meteo.dwg
- **Github :** Collaborative repositories https://github.com/OGCMetOceanDWG page.
- **Co-Chairs :** Chris Little and Marie-Françoise Voidrot-Martinez

Events UPDATED

- MetOceanTeleconfs & Meetings ,
- Conferences related to the Met Ocean DWG points of interests
- "Met Ocean DWG Meetings" and *"Use of GIS/OGC Standards in Meteorology workshops" archives*

Current activities

- **WMS 1.3 Best Practice for Ensemble data** - Current draft: http://external.opengeospatial.org/twiki_public/pub/MetOceanDWG/WebHome /16-086r1_OGC_Best_Practice_for_WMS_with_Ensembles_of_Forecast_Data.doc

Examples of GetCapabilities of Ensemble WMS implementations

This document is on works and the discussions will be continued in January 2016. Please review it and send feedbacks and ideas.

This thread of work is driven by Jurgen Seib

- **WCS 2.0 Profile :** 2 documents have been published by Peter Trevelyan as discussion paper and a third one should be published soon in the pending docs repository - Requires to be OGC member. A fourth paper, by Paul Hershberg of the National Weather Service, describes the differences in WCS 1.0 and WCS 2.0 with the Met Ocean Application Profile and Extension. It serves to denote function (getCapabilities, etc) API's and metadata returned in response

EN

Example of Implementation Differences - WCS

	Visual Weather WCS	THREDDS WCS (1.0.0)
Service	Data source (e.g. all Global model runs)	Single instance of data source (e.g. a single Global model run)
COVERAGE	Met parameter (e.g. temperature) but no standard names	Met parameter (e.g. temperature) but no standard names
Spatial domain	2D BBOX + 'ELEVATION' range parameter	3D BBOX + 'VERTICAL' range parameter
Time domain	TIME for validity time + 'DIM_RUN' & 'DIM_FORECAST' range parameters for analysis time and forecast period	TIME for validity time (Analysis time is covered by service)

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