# REAL-TIME AND ARCHIVE DATA SERVICES AT ECMWF

## D. Jokić

**Operations Department - ECMWF**

**ECMWF**

# ECMWF data services

- **Background**
- **Definitions and rules**
- **What data services do we provide?**
- **What products are available?**
- **When is data available?**
- **How to get data?**
- **How much does it cost?**
- **How to become a customer?**
- **What support do we provide for customers?**
- **Future plans**

**ECMWF**

# Background



**Supporting States and Co-operation**

| Belgium | Ireland | Portugal |
| Denmark | Italy | Switzerland |
| Germany | Luxembourg | Finland |
| Spain | The Netherlands | Sweden |
| France | Norway | Turkey |
| Greece | Austria | United Kingdom |

*Co-operation agreements or working arrangements with:*

| Czech Republic | ACMAD |
| Croatia | ESA |
| Estonia | EUMETSAT |
| Hungary | WMO |
| Iceland | JRC |
| Lithuania | CTBTO |
| Morocco | CLRTAP |
| Romania | |
| Serbia | |
| Slovenia | |

- **ECMWF provides data to Member States**

  - **Real-time data through dissemination and web**

  - **NMSs have open access to archive data**

- **ECMWF was allowed to sell archive data**

- **Making ECMWF Real-Time Products commercially available**

  - **Increased interest from commercial world**

  - **Creation of Advisory Committee for Data Policy  (at ECMWF)**

  - **Creation of Data and Services Section**

  - **Lowering of maximum charge for commercial users**

  - **Delegation of delivery of data to ECMWF**

  - **Harmonising rules and costs with ECOMET**
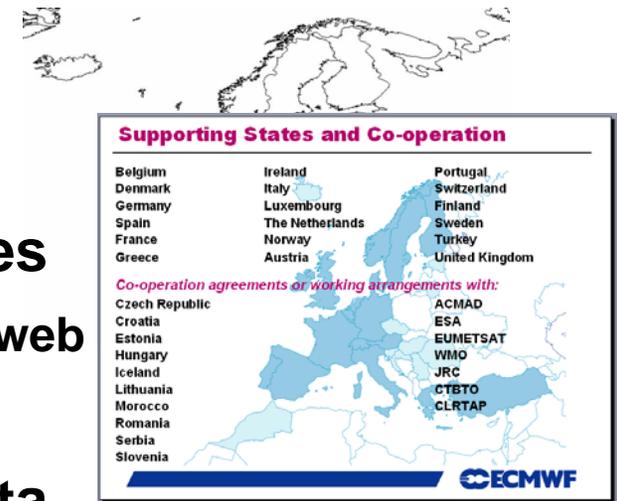
# ECMWF Data services

- ## Real-Time
  - Dissemination on a daily bases
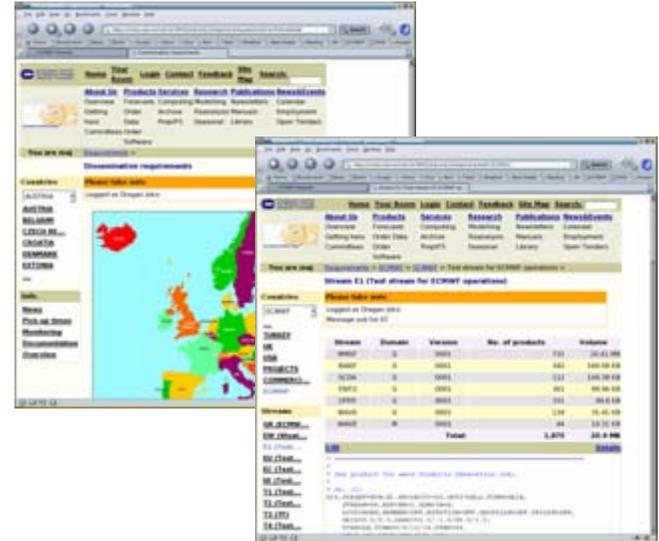
- ## Archive data
  - By order from Data.Services@ecmwf.int
  - Direct MARS access (granted to maximum charge commercial customers)

- ## Web products
  - Updated on a daily bases

**ECMWF**

# Definitions

**ECMWF**

**NMS**
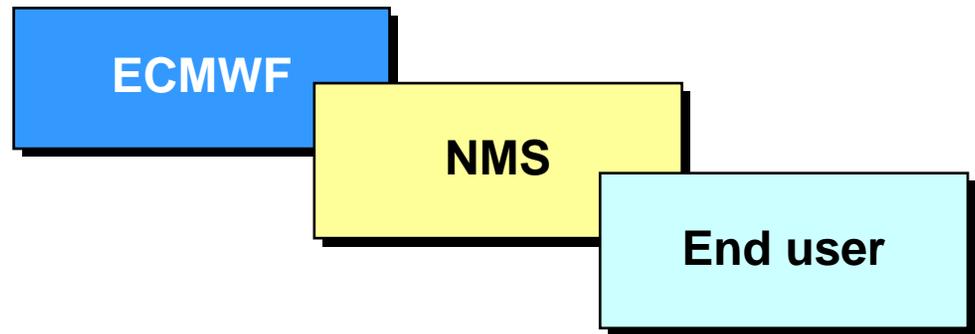
**End user**

- **Users**

  - Service provider  (acquires data to supply Value Added Services)

  - End user (uses data for own commercial, industrial or personal purpose)

  - Research and education (no re-distribution or Value Added Service)

- **Types of products – in line with ECOMET definitions**

  - Type A Products – raw products

  - Value Added Services (VAS) – derived or processed products

- **Licensor – ECMWF or NMS of an ECMWF's Member State or Type 1 Co-operating State**

ECMWF

# Using Data Services

# Level playing field

- **Rules set by ECMWF Council**

- **Real-Time Products are available to all users receiving data directly from ECMWF at the same time through**

  - **Dissemination**

  - **Web**

  - **No real-time ('Valid') data is available through direct MARS access**

- **Commercial arm of NMS is treated as a commercial customer**

  - **They pay the same price**

  - **They pay for the data**

  - **Commercial catalogue applies**

# Products
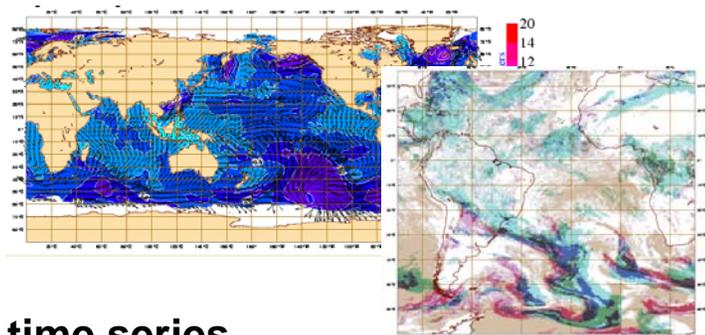


- ● **Real-Time**

  - **Data in field form and single point time series**

  - **Products are listed in *The Catalogue of Real-Time Products* www.ecmwf.int/products/catalogue/**

- ● **Archive data**

  - ***Archive Catalogue* contains all operational archived data (including ERA-40,…) www.ecmwf.int/products/data/archive/ECMWF_catalogue/**

  - **All available except valid data (analysis time + step <= yesterday)**

  - **Observations (limited set)**

- ● **Web**

  - **Products are available on 'As is' bases**

  - **Multi-Images, EPSgrams, Animations, …**

    **www.ecmwf.int/products/forecasts/d/catalogue_content**

**ECMWF**

# Catalogue of Real-Time Products

- **Main deterministic forecast**
- **Ensemble Prediction VarEPS**
- **Global Wave Model**
- **European Wave Model**
- **Wave ensemble products**
- **Seasonal forecast**
- **Monthly forecast**
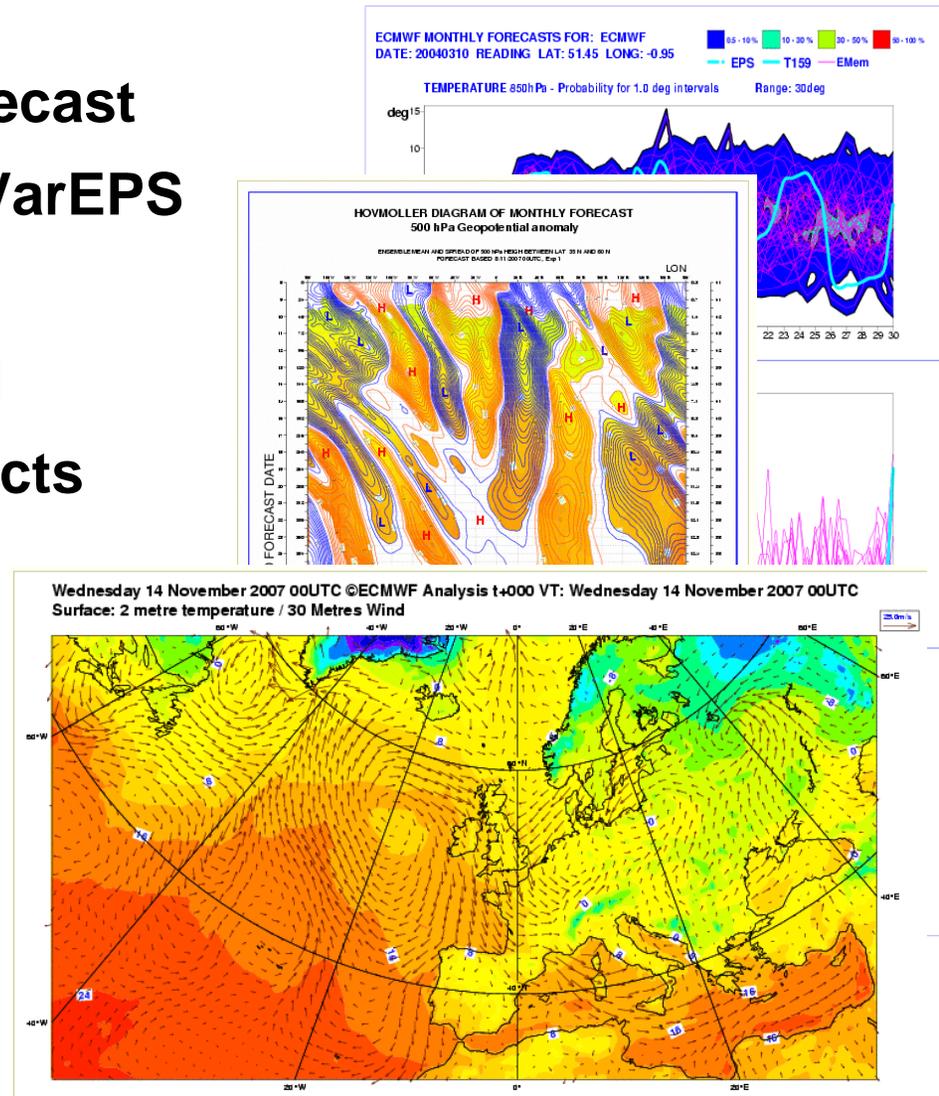
# Data types

- **Analysis**

- **Forecast**

- **Perturbed forecast**

- **Weather parameter**

- **Derived data types**

  - **Forecast probabilities**

  - **Cluster means**

  - **Extreme forecast index**

  - **Anomalies**

  - **Ensemble means**
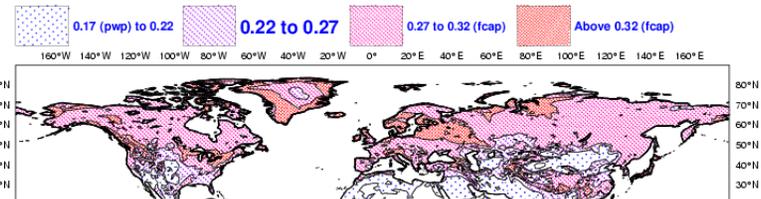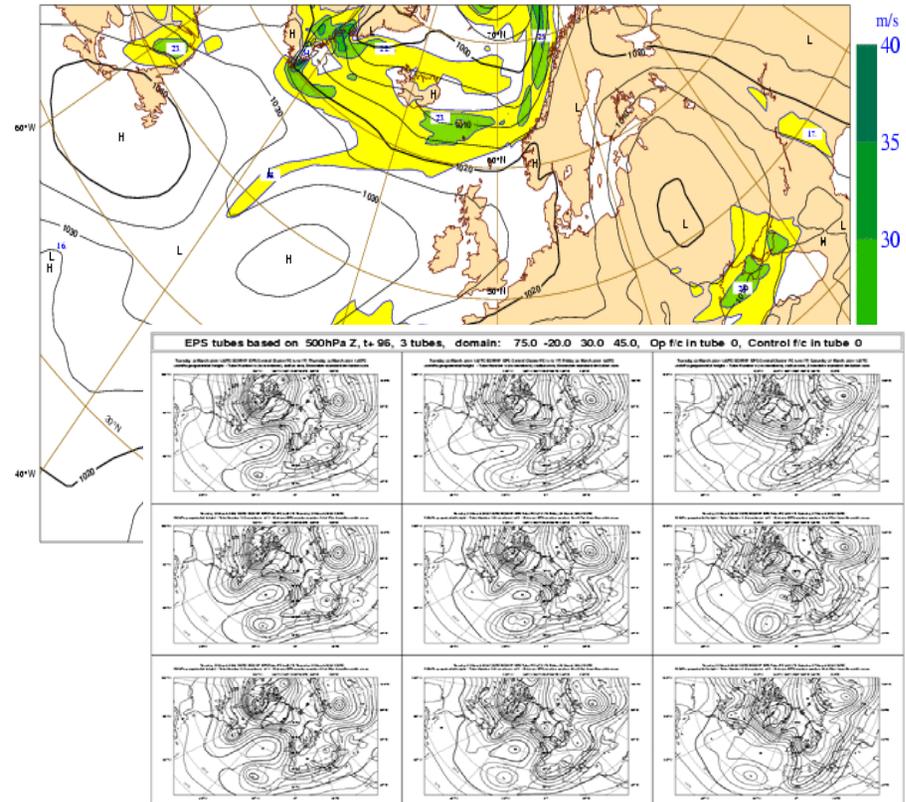
# Times and steps

- **00, 06, 12 and 18 UTC based analysis**

| | Run | Duration | Frequency |
|---|---|---|---|
| **Deterministic** <br> **Global wave** | **Daily 00UTC, 12UTC** | **10 days** | **3 hourly up to 72, 6 hourly to 240** |
| **VarEPS** <br> **Wave EPS** | **Daily 00UTC, 12UTC** | **15 days** | **6 hourly** |
| **European wave** | **Daily 00TC, 12UTC** | **5 days** | **6 hourly** |
| **Monthly forecast** | **Weekly** | **1 month** | **6/12 hourly** |
| **Seasonal forecast** | **Monthly** | **7 months** | **6/12 hourly** |

**ECMWF**

# Vertical levels

- **Model levels**

  - **Deterministic L91**

  - **EPS L62**

- **Pressure levels**

  - **Deterministic**

  **1000 to 10 hPa 15 levels**

  - **EPS**

  **1000 to 200 hPa 6 levels**

- **Single level parameters**



91-level model
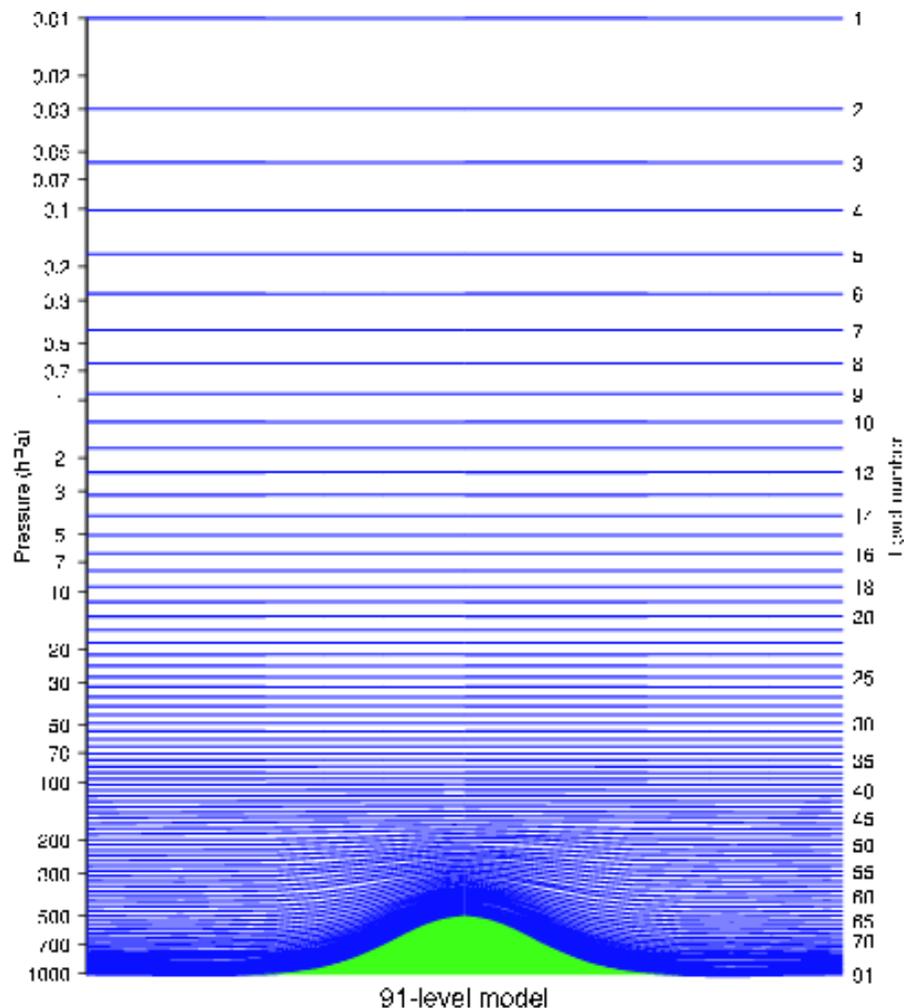
# Data Representation and resolution

| | Spherical harmonics | Gaussian grid | Latitude-Longitude |
|---|---|---|---|
| **Deterministic** | **T799** | **N400** | **0.25/0.25** |
| **VarEPS** | **T399/T255** | **N200/N128** | **0.5/0.5** |
| **European Wave** | **/** | **/** | **0.25/0.25** |
| **Monthly** | **T159** | **N80** | **1.5/1.5** |
| **Seasonal** | **T159** | **N80** | **1.5/1.5** |

- **Any sub-area**
- **Frames and Bit-map based products**

**ECMWF**

# Format

- **WMO FM-92 GRIB-1**
- **WMO FM-94 BUFR**
- **GRIB-2**

# Media for archive data

- **Tapes SDLT, DDS4, LTO2**
- **CD, DVD**
- **USB LaCie**
- **FTP push, download**
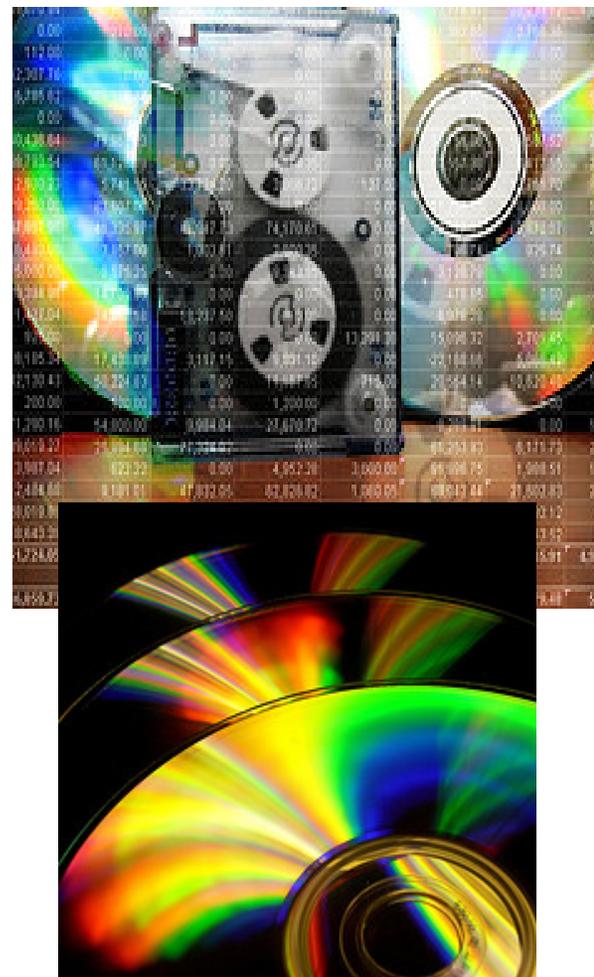
**ECMWF**

# Current Real-time data Dissemination schedule



Deterministic forecast
Global Wave model

European Wave

EPS
Wave EPS

00 UTC

Deterministic forecast
Global Wave model

European Wave

EPS
Wave EPS

12 UTC

0:00   3:00   12:00   15:00   24:00

5:50
7:15
7:30
7:50
9:06
8:05
12:00-12:06

17:50
19:15
19:30
19:50
21:06
20:05
22:00
22:30

Seasonal forecast (15th)

Monthly forecast (THU)
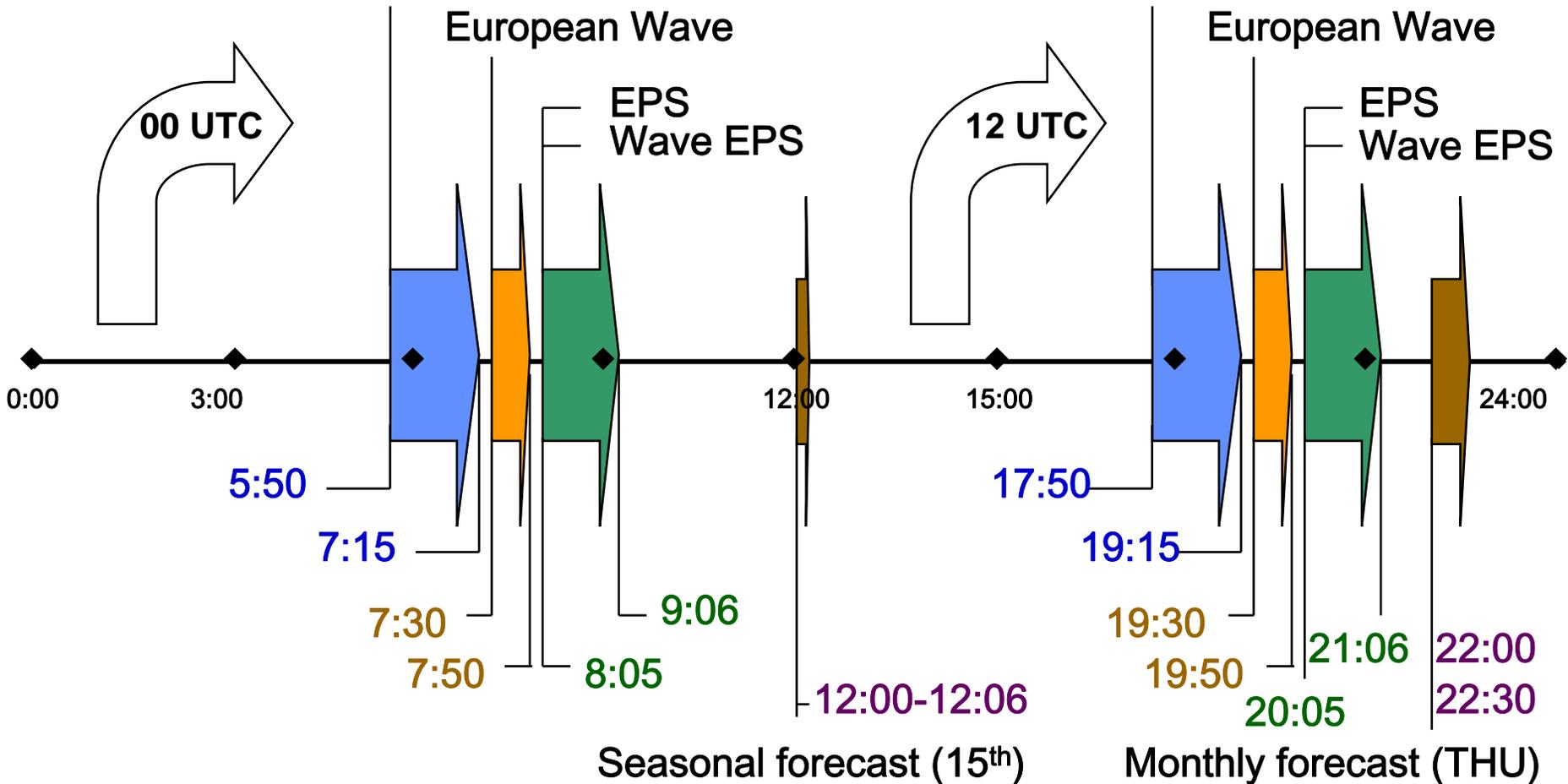
ECMWF

# Getting Real-Time Products from ECMWF

- **Data can be provided**
  - Over INTERNET (up to 75GB daily at no extra cost)
  - Over dedicated private line (financed by user)
- **ECMWF disseminates products as one file per forecast/analysis time step**
- **Dissemination files have unique names**
- **We push data according to dissemination schedule**
- **Users can**
  - Set transmission priority for each data set
  - Split request into several logical entities - dissemination streams
  - Have backup host configured
  - Chose number of parallel transmissions, …..
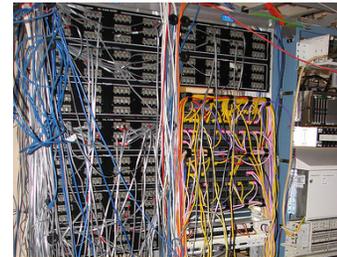
**ECMWF**

# Tariffs

- **Price = Information cost + Handling charge**
- **Information cost**
  - Cost of data – determined by ECMWF Council
- **Handling charge**
  - **Real-Time Products:** Cost of labour, computer resources and network
  - **Archive data:** Cost of labour, retrieval, post-processing, postage and media
- **Type of user**
  - Research or non-research
- **Handling charge is determined by Licensor**

# Information cost

- **Costing formula based on the ratio between resolution of the current operational deterministic model and the resolution and area requested**

- **Cost differs for Real-Time and Archive data for the 'Valid factor'**

  - **Valid factor is 1 for Real-Time Products**

  - **Valid factor is 0.2 for Archive data**

- **Same from NMS or ECMWF**

- **No information charge for research and educational users**
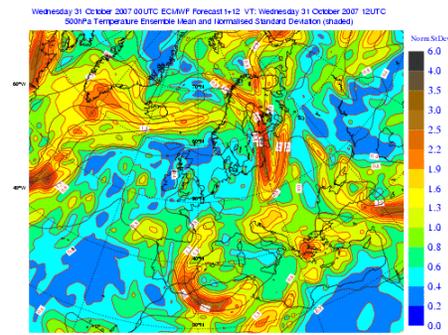
**ECMWF**

# Handling charge - Archive data

- **If data is supplied by ECMWF**

  - Costing formula includes two factors

    - Number of requested days – factor different for each data set

    - Volume of requested products

  - The cost of media is fixed for any amount (except for USB LaCie) and is inclusive of postage

  - Minimum handling charge applies

    **www.ecmwf.int/products/data/archive/charges/handling_charge.html**

- **If data is supplied by NMS**

  - NMS's handling charge applies

- **Some NMSs do not provide archive data service but delegate provision of archive data to ECMWF**

ECMWF

# Handling charge - Real-Time Products

- **If Licensor is ECMWF**

    - **Support fee + Contract and Set-up fees**

    - **Some fees are waived for maximum charge customers**

    - **More information from Data.Services@ecmwf.int**

- **If licensor is NMS of an ECMWF's Member State**

    - **NMS's handling charge applies**

ECMWF

# Web products tariff

- **The price is EUR 28,000 per year**

- **Web products are available 'as whole'**

- **On 'as is' bases**

- **No download**

- **For maximum charge customers web cost is included in the price**

- **Products can be added or discontinued at the discretion of ECMWF**

**ECMWF**
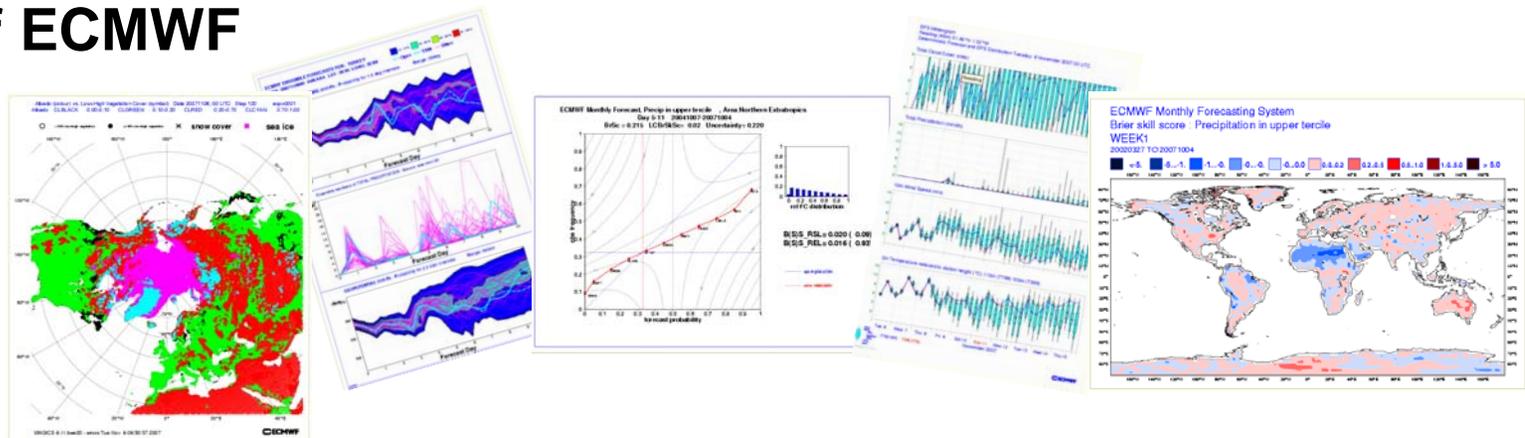
# Maximum charge customer

- **Price per year is sum of**
  - **EUR 140,000 information cost and**
  - **Licensor's handling charge**

- **Daily real-time dissemination of up to 75GB at no extra cost if data provided over Internet**

- **Access to web products included**

- **Direct access to MARS included**

- **Open access to all products in the catalogue**

- **Can change Real-Time Products request over time to suit their changing needs and get test data**

**ECMWF**

# How to become user of ECMWF Data Services

- ● **Within ECMWF territory**
  - - **Via NMS of an ECMWF's Member State or Type 1 Co-operating State**

- ● **Outside ECMWF territory**
  - - **Directly to ECMWF Data.Services@ecmwf.int**
  - - **Via NMS of an ECMWF's Member State or Type 1 Co-operating State**

- ● **For information**
  - - **Go to www.ecmwf.int/products/data/**
    - ▪ **Browse the products, try the costing yourself, …**
  - - **Send e-mail to Data.Services@ecmwf.int**
    - ▪ **To ask for more detailed information, to start the procedure, to organise free trial, to get data, …**

**ECMWF**

# Support that we provide

- **For users receiving Real-Time Products directly from ECMWF including delegated delivery**

- **Operational 24/7 Call-Desk support as for Member States**

- **We inform customers of**

  - **Scheduled/non-scheduled interruptions to the service**

  - **Forthcoming Model changes effecting data sets**

- **One week free trial for web data service for prospective customers**

| Telephone | email |
|---|---|
| +44 118 9499 303 | calldesk@ecmwf.int |

ECMWF

# Future

- **For maximum charge customers extend our on-line dissemination system to provide same support as for Member States**

  - **Access and change dissemination requirements**

  - **Control transmission**

  - **Do testing**

- **Further expand and improve on-line costing system for archive data**

**ECMWF**

*Thank you*

**ECMWF**