



The Catalogue of ECMWF Real-Time Products

Table of Contents

The Catalogue of ECMWF Real-Time Products.....	1
Introduction.....	2
I-i: Atmospheric fields.....	2
1.1 Parameters.....	3
1.2 Product resolution.....	4
1.3 Forecast.....	4
1.3.1 Forecast time-steps.....	4
1.3.2 Base times.....	5
1.4 Analysis.....	5
1.4.1 Analysis times.....	5
I-ii: Time series of weather parameters.....	5
2.1 Parameters.....	5
2.2 Product resolution.....	5
2.3 Forecast time-steps.....	6
2.4 Base times.....	6
II-i: Global ocean wave model.....	6
1.1 Parameters.....	6
1.2 Product resolution.....	7
1.3 Forecast.....	7
1.3.1 Forecast time-steps.....	7
1.3.2 Base times.....	7
1.4 Analysis.....	7
1.4.1 Analysis times.....	7
II-ii: European waters ocean wave model.....	7
2.1 Parameters.....	7
2.2 Product resolution.....	8
2.3 Forecast.....	8
2.3.1 Forecast time-steps.....	8
2.3.2 Base times.....	8
2.4 Analysis.....	8
2.4.1 Analysis times.....	8
III-i: Atmospheric fields.....	8
1.1 Parameters.....	9
1.2 Product resolution.....	10
1.3 Forecast time-steps.....	10
1.4 Base times.....	10
III-ii: Clusters.....	10
2.1 Parameters.....	10
2.2 Product resolution.....	10
2.3 Forecast time-steps.....	10
2.4 Clustering-domains.....	10
2.5 Base times.....	11
III-iii: Probabilities.....	11
3.1 Parameters.....	11
3.2 Product resolution.....	11
3.3 Forecast time-steps for daily and instantaneous events.....	12
3.3 Forecast ranges for accumulated or averaged events.....	12

Table of Contents

Introduction

3.4 Base times.....	12
III–iv: Time series of weather parameters.....	12
4.1 Parameters.....	12
4.2 Product resolution.....	13
4.3 Forecast time–steps.....	13
4.4 Base times.....	13
III–v: Extreme Forecast Index.....	13
5.1 Parameters.....	13
5.2 Product resolution.....	14
5.3 Forecast time–steps for instantaneous extreme forecast indexes.....	14
5.4 Forecast ranges for accumulated or averaged extreme forecast indexes.....	14
5.5 Base times.....	15
III–vi: Ensemble means.....	15
6.1 Parameters.....	15
6.2 Product resolution.....	15
6.3 Forecast time–steps.....	15
6.4 Base times.....	16
III–vii: Ensemble standard deviations.....	16
7.1 Parameters.....	16
7.2 Product resolution.....	16
7.3 Forecast time–steps.....	16
7.4 Base times.....	16
IV–i: Wave fields.....	17
1.1 Parameters.....	17
1.2 Product resolution.....	17
1.3 Forecast time–steps.....	17
1.4 Base times.....	17
IV–ii: Probabilities.....	18
2.1 Parameters.....	18
2.2 Product resolution.....	18
2.3 Forecast time–steps for instantaneous events.....	18
2.3 Forecast ranges for averaged events.....	18
2.4 Base times.....	19
V–i: Monthly means of ensemble means.....	19
1.1 Parameters.....	19
1.2 Product resolution.....	20
1.3 Forecast ranges.....	20
1.4 Base times.....	20
V–ii: Monthly mean anomalies of ensemble means.....	20
2.1 Parameters.....	20
2.2 Product resolution.....	21
2.3 Forecast ranges.....	21
2.4 Base times.....	21
V–iii: Monthly means of individual ensemble member forecasts.....	21
3.1 Parameters.....	21
3.2 Product resolution.....	22
3.3 Forecast ranges.....	22

Table of Contents

Introduction

3.4 Base times.....	22
V–iv: Monthly mean anomalies of individual ensemble member forecasts.....	22
4.1 Parameters.....	22
4.2 Product resolution.....	23
4.3 Forecast ranges.....	23
4.4 Base times.....	23
V–v: Individual forecast runs (daily real–time).....	23
5.1 Parameters.....	23
5.2 Product resolution.....	24
5.3 Forecast time–steps.....	24
5.4 Base times.....	25
Appendix.....	25
A.1 Definition of the monthly fields.....	25
VI–i: Weekly means of ensemble means (including hindcast products).....	25
1.1 Parameters.....	26
1.2 Product resolution.....	26
1.3 Forecast ranges.....	26
1.4 Base times.....	27
VI–ii: Weekly mean anomalies of ensemble means.....	27
2.1 Parameters.....	27
2.2 Product resolution.....	27
2.3 Forecast ranges.....	28
2.4 Base times.....	28
VI–iii: Weekly means of individual ensemble member forecasts (including hindcast products).....	28
3.1 Parameters.....	28
3.2 Product resolution.....	29
3.3 Forecast ranges.....	29
3.4 Base times.....	29
VI–iv: Weekly mean anomalies of individual ensemble member forecasts.....	29
4.1 Parameters.....	29
4.2 Product resolution.....	30
4.3 Forecast ranges.....	30
4.4 Base times.....	30
VI–v: Individual forecast runs (daily real–time and hindcast products).....	30
5.1 Parameters.....	30
5.2 Product resolution.....	31
5.3 Forecast time–steps.....	32
5.4 Base times.....	32
VI–vi: Probabilities (weekly products).....	32
6.1 Parameters.....	32
6.2 Product resolution.....	33
6.3 Forecast ranges.....	33
6.4 Base times.....	33
VIII–i: Multi–model mean of ensemble mean monthly mean anomalies.....	34
1.1 Parameters.....	34
1.2 Product resolution.....	34
1.3 Forecast ranges.....	34

Table of Contents

Introduction	
1.4 Base times.....	34
Conditions.....	36
Licence Arrangements.....	37
Catalogue Contact Points.....	38
Tariffs.....	43
1. Introduction.....	43
2. Research Project and Educational Use.....	43
3. Rules of the Costs Calculation.....	43
4. Reduced Licence fees for small service providers.....	47
5. Tariffs of Web Products.....	47
6. Other rules (applicable to all data sets).....	47
7. Specific tariffs under Agreements 1BI (Service Provider) and 1BII (Broadcaster).....	48

The Catalogue of ECMWF Real–Time Products

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NMSs of Member States and Co–operating States will find details of administrative procedures, information on handling requests for information, and the detailed rules governing the distribution and dissemination of ECMWF Real–time Products, in the Guide to the Catalogue of ECMWF Products.

- Introduction
 - Product Sets
 - Product Set I – Products from the ECMWF Deterministic Atmospheric Model
 - Product Set II – Products from the ECMWF Deterministic Ocean Wave Model
 - Product Set III – Products from the Atmospheric Ensemble Prediction System
 - Product Set IV – Products from the Ocean Wave Ensemble Prediction System
 - Product Set V – Products from the Seasonal Forecasting System
 - Product Set VI – Products from the Monthly Forecasting System
 - Product Set VII – Web Products
 - Product Set VIII – Products from the EUROSIP Multi–model Seasonal Forecasting System
 - Conditions
 - Delivery arrangements
 - Tariffs
-

Introduction

This Catalogue outlines the real-time meteorological and oceanographic products available from the ECWMF forecasting system, the conditions applied to their supply, the tariffs and licence arrangements. Requests for real-time products from customers inside the ECMWF territory should be addressed to the contact points listed later in this Catalogue, and not directly to ECMWF. Customers from outside the ECMWF territory can contact the ECMWF directly or any of the contact points listed later in this Catalogue.

It is expected that the products from this Catalogue will be especially appropriate for use by meteorological and oceanographic service providers i.e. those creating weather-related value added services, and by end users who have some background knowledge of atmospheric or oceanographic sciences. Other forms of meteorological and oceanographic services and products are additionally available via the National Meteorological Services (NMSs).

A brief summary of the ECMWF operational deterministic forecasting system is given here. However, it is essential that users not thoroughly familiar with the ECWMF forecasting system refer to the ECMWF publication:

Meteorological Bulletin M3.2: User Guide to ECMWF Products

The Director
ECMWF
Shinfield Park
Reading
RG2 9AX
United Kingdom

Telephone: [+44] 118 949 9000

Telefax: [+44] 118 986 4950

e-mail: ECMWF-Director@ecmwf.int

Set I: Products from the Deterministic Atmospheric Model

The following sub-sets are available from the Deterministic Atmospheric Model:

- I-i: Atmospheric fields
- I-ii: Time series of weather parameters

For a description, see [Meteorological Bulletin M3.2 User Guide to ECMWF Products](#).

I-i: Atmospheric fields

The products are provided in GRIB code or in plotted form. The plots are derived from the GRIB code without further processing.

1.1 Parameters

I–i–a) Single level parameters

- **Forecast and Analysis fields**
 - ◆ 10 metre U–velocity (10U)
 - ◆ 10 metre V–velocity (10V)
 - ◆ 2 metre dewpoint temperature (2D)
 - ◆ 2 metre temperature (2T)
 - ◆ High cloud cover (HCC)
 - ◆ Low cloud cover (LCC)
 - ◆ Mean sea level pressure (MSL)
 - ◆ Medium cloud cover (MCC)
 - ◆ Sea Ice Cover (CI)
 - ◆ Sea surface temperature (SSTK)
 - ◆ Skin temperature (SKT)
 - ◆ Snow depth (SD)
 - ◆ Soil temperature level 1 (STL1)
 - ◆ Soil temperature level 2 (STL2)
 - ◆ Soil temperature level 3 (STL3)
 - ◆ Soil temperature level 4 (STL4)
 - ◆ Surface pressure (SP)
 - ◆ Total cloud cover (TCC)
 - ◆ Total column Ozone (TCO3)
 - ◆ Total column water vapour (TCWV)
 - ◆ Volumetric soil water layer 1 (SWVL1)
 - ◆ Volumetric soil water layer 2 (SWVL2)
 - ◆ Volumetric soil water layer 3 (SWVL3)
 - ◆ Volumetric soil water layer 4 (SWVL4)
- **Forecast fields only**
 - ◆ 10 metre wind gust in the past 6 hours (10FG6)
 - ◆ 10 metre wind gust since last post–processing (10FG)
 - ◆ Boundary layer height (BLH)
 - ◆ Convective available potential energy (CAPE)
 - ◆ Convective precipitation (CP)
 - ◆ Evaporation (E)
 - ◆ Forecast albedo (FAL)
 - ◆ Large scale precipitation (LSP)
 - ◆ Maximum temperature at 2m since last 6hours (MX2T6)
 - ◆ Maximum temperature at 2m since last post–processing (MX2T)
 - ◆ Minimum temperature at 2m since last 6hours (MN2T6)
 - ◆ Minimum temperature at 2m since last post–processing (MN2T)
 - ◆ Snow fall (convective + stratiform) (SF)
 - ◆ Surface solar radiation downwards (SSRD)
 - ◆ Total precipitation (TP)
- **Analysis fields only**
 - ◆ Albedo (AL)
 - ◆ Land/sea mask (LSM)
 - ◆ Orography (Z)

If requested by the user, the land–sea mask (LSM) and the model orography (Z) will be provided free of charge once with every forecast dissemination.

I-i-b) Pressure level parameters

- *Forecast and Analysis fields*
 - ◆ Divergence (D)
 - ◆ Geopotential height (GH)
 - ◆ Potential Vorticity (PV)
 - ◆ Relative humidity (R)
 - ◆ Specific humidity (Q)
 - ◆ Temperature (T)
 - ◆ U-velocity (U)
 - ◆ V-velocity (V)
 - ◆ Vertical velocity (W)
 - ◆ Vorticity (VO)

All parameters are available at levels 1000, 950, 925, 900, 850, 800, 700, 600, 500, 400, 300, 250, 200, 150, 100, 70, 50, 30, 20, 10, 7, 5, 3, 2, 1 hPa

I-i-c) Model level parameters

- *Forecast and Analysis fields*
 - ◆ Cloud cover (CC)
 - ◆ Cloud ice water content (CIWC)
 - ◆ Cloud liquid water content (CLWC)
 - ◆ Divergence (D)
 - ◆ Logarithm of surface pressure (LN_{SP})
 - ◆ Specific humidity (Q)
 - ◆ Temperature (T)
 - ◆ U-velocity (U)
 - ◆ V-velocity (V)
 - ◆ Vertical velocity (W)
 - ◆ Vorticity (VO)
- *Analysis fields only*
 - ◆ Orography (Z)

If requested by the user, the model orography (Z) will be provided free of charge once with every forecast dissemination.

1.2 Product resolution

- 0.25° x 0.25° lat/long grid or any multiple thereof (global or sub-area)
- On model (Gaussian) N400 grid (global or sub-area)
- Spectral components (T799) for upper-air fields (global area only)

1.3 Forecast

1.3.1 Forecast time-steps

- ◆ T+3h to T+72h at 3-hour intervals and T+78h to T+240h at 6-hour intervals

1.3.2 Base times

- ◆ 00 UTC, 12 UTC

1.4 Analysis

1.4.1 Analysis times

- ◆ 00 UTC, 06 UTC, 12 UTC, 18 UTC

I-ii: Time series of weather parameters

The products consist of values of the individual members of the real-time forecast at grid points (single locations). The products are provided in BUFR code.

2.1 Parameters

- 10 metre U-velocity (10U)
- 10 metre V-velocity (10V)
- 10 metre wind gust in the past 6 hours (10FG6)
- 2 metre dewpoint temperature (2D)
- 2 metre temperature (2T)
- Convective precipitation (CP)
- Land/sea mask (LSM)
- Large scale precipitation (LSP)
- Maximum temperature at 2m since last 6hours (MX2T6)
- Mean sea level pressure (MSL)
- Minimum temperature at 2m since last 6hours (MN2T6)
- Orography (Z)
- Snow depth (SD)
- Snow fall (convective + stratiform) (SF)
- Soil temperature level 1 (STL1)
- Soil temperature level 2 (STL2)
- Soil temperature level 3 (STL3)
- Soil temperature level 4 (STL4)
- Surface pressure (SP)
- Surface solar radiation downwards (SSRD)
- Total cloud cover (TCC)
- Total precipitation (TP)
- Volumetric soil water layer 1 (SWVL1)
- Volumetric soil water layer 2 (SWVL2)
- Volumetric soil water layer 3 (SWVL3)
- Volumetric soil water layer 4 (SWVL4)

2.2 Product resolution

- On model (Gaussian)

N400 grid

2.3 Forecast time–steps

- T+0h to T+240h at 6–hour intervals

2.4 Base times

- 00 UTC, 12 UTC

Set II: Products from the Deterministic Ocean Wave Model

The following sub–sets are available from the Deterministic Ocean Wave Model:

- II–i: Global ocean wave model
- II–ii: European waters ocean wave model

For a description, see Meteorological Bulletin M3.2 User Guide to ECMWF Products.

II–i: Global ocean wave model

The products are provided in GRIB code or in plotted form. The plots are derived from the GRIB code without further processing.

1.1 Parameters

- *Forecast and Analysis fields*
 - ◆ 2D wave spectra (2DFD)
 - ◆ Mean direction of total swell (MDTS)
 - ◆ Mean direction of wind waves (MDWW)
 - ◆ Mean period of total swell (MPTS)
 - ◆ Mean period of wind waves (MPWW)
 - ◆ Mean wave direction (MWD)
 - ◆ Mean wave period (MWP)
 - ◆ Mean wave period based on second moment (MP2)
 - ◆ Mean wave period based on second moment for swell (P2PS)
 - ◆ Mean wave period based on second moment for wind waves (P2WW)
 - ◆ Peak period of 1D–spectra (PP1D)
 - ◆ Significant height of total swell (SHTS)
 - ◆ Significant height of wind waves (SHWW)
 - ◆ Significant wave height (SWH)

Due to constraints imposed by GRIB the 2D wave spectra (2DFD) is coded in 30 frequencies and 24 directions, resulting in a total of 720 fields.

1.2 Product resolution

- 0.25° x 0.25° lat/long grid or any multiple thereof (global or sub-area)

1.3 Forecast

1.3.1 Forecast time-steps

- ◆ T+3h to T+72h at 3-hour intervals and T+78h to T+240h at 6-hour intervals
- ◆ T+6h to T+120h at 6-hour intervals for 2D wave spectra (2DFD)

1.3.2 Base times

- ◆ 00 UTC, 12 UTC

1.4 Analysis

1.4.1 Analysis times

- ◆ 00 UTC, 06 UTC, 12 UTC, 18 UTC

II-ii: European waters ocean wave model

The products are provided in GRIB code or in plotted form. The plots are derived from the GRIB code without further processing.

2.1 Parameters

- *Forecast and Analysis fields*
 - ◆ 2D wave spectra (2DFD)
 - ◆ Maximum individual wave height (HMAX)
 - ◆ Mean direction of total swell (MDTS)
 - ◆ Mean direction of wind waves (MDWW)
 - ◆ Mean period of total swell (MPTS)
 - ◆ Mean period of wind waves (MPWW)
 - ◆ Mean wave direction (MWD)
 - ◆ Mean wave period (MWP)
 - ◆ Mean wave period based on second moment (MP2)
 - ◆ Mean wave period based on second moment for swell (P2PS)
 - ◆ Mean wave period based on second moment for wind waves (P2WW)
 - ◆ Peak period of 1D-spectra (PP1D)
 - ◆ Period corresponding to maximum individual wave height (TMAX)
 - ◆ Significant height of total swell (SHTS)
 - ◆ Significant height of wind waves (SHWW)
 - ◆ Significant wave height (SWH)

Due to constraints imposed by GRIB the 2D wave spectra (2DFD) is coded in 30 frequencies and 24 directions, resulting in a total of 720 fields.

2.2 Product resolution

- 0.125° x 0.125° lat/long grid or any multiple thereof (global or sub-area)

2.3 Forecast

2.3.1 Forecast time-steps

- ◆ T+6h to T+120h at 6-hour intervals

2.3.2 Base times

- ◆ 00 UTC, 12 UTC

2.4 Analysis

2.4.1 Analysis times

- ◆ 00 UTC, 06 UTC, 12 UTC, 18 UTC

Set III: Products from the Atmospheric Ensemble Prediction System

The following sub-sets are available from the Atmospheric Ensemble Prediction System:

- III-i: Atmospheric fields
- III-ii: Clusters
- III-iii: Probabilities
- III-iv: Time series of weather parameters
- III-v: Extreme Forecast Index
- III-vi: Ensemble means
- III-vii: Ensemble standard deviations

For a description, see [Meteorological Bulletin M3.2 User Guide to ECMWF Products](#).

III-i: Atmospheric fields

The products consist of control and perturbed forecasts plus the equivalent deterministic products. Customers choosing forecast steps from Leg 2 (see below) will receive an high resolution and a low resolution calibration forecast at no extra cost. The deterministic product is suppressed beyond day 10. The fields are provided in GRIB code.

1.1 Parameters

III-i-a) Single level parameters (6 hourly products)

- 10 metre U-velocity (10U)
- 10 metre V-velocity (10V)
- 10 metre wind gust in the past 6 hours (10FG6)
- 2 metre dewpoint temperature (2D)
- 2 metre temperature (2T)
- Evaporation (E)
- Land/sea mask (LSM)
- Maximum temperature at 2m since last 6hours (MX2T6)
- Mean sea level pressure (MSL)
- Minimum temperature at 2m since last 6hours (MN2T6)
- Orography (Z)
- Sea surface temperature (SSTK)
- Snow fall (convective + stratiform) (SF)
- Soil temperature level 1 (STL1)
- Soil temperature level 2 (STL2)
- Soil temperature level 3 (STL3)
- Soil temperature level 4 (STL4)
- Surface pressure (SP)
- Surface solar radiation downwards (SSRD)
- Total cloud cover (TCC)
- Total precipitation (TP)
- Volumetric soil water layer 1 (SWVL1)
- Volumetric soil water layer 2 (SWVL2)
- Volumetric soil water layer 3 (SWVL3)
- Volumetric soil water layer 4 (SWVL4)

If requested by the user, the land-sea mask (LSM) and the model orography (Z) will be provided free of charge once with every forecast dissemination.

III-i-b) Pressure level parameters

- *At levels 1000, 925, 850, 700, 500, 200 hPa:*
 - ◆ Divergence (D)
 - ◆ Geopotential height (GH)
 - ◆ Relative humidity (R)
 - ◆ Specific humidity (Q)
 - ◆ Temperature (T)
 - ◆ U-velocity (U)
 - ◆ V-velocity (V)
 - ◆ Vertical velocity (W)
 - ◆ Vorticity (VO)
- *At level 200 hPa:*
 - ◆ Stream function (STRF)
 - ◆ Velocity potential (VPOT)

1.2 Product resolution

Leg 1:

- $0.5^\circ \times 0.5^\circ$ lat/long grid or any multiple thereof (global or sub-area)
- On model (Gaussian) N128, N200 grid (global or sub-area)
- Spectral components (T255, T399) for upper-air fields (global area only)

Leg 2:

- $0.5^\circ \times 0.5^\circ$ lat/long grid or any multiple thereof (global or sub-area)
- On model (Gaussian) N128 grid (global or sub-area)
- Spectral components (T255) for upper-air fields (global area only)

1.3 Forecast time-steps

Leg 1:

- T+0h to T+240h at 6-hour intervals

Leg 2:

- T+246h to T+360h at 6-hour intervals

1.4 Base times

- 00 UTC, 12 UTC

III-ii: Clusters

2.1 Parameters

- At 850, 500 hPa:
 - ◆ Temperature (T)
- At 1000, 500 hPa:
 - ◆ Geopotential height (GH)

2.2 Product resolution

- $1.5^\circ \times 1.5^\circ$ lat/long grid or any multiple thereof (global or sub-area)

2.3 Forecast time-steps

- T+72h to T+168h at 12-hour intervals

2.4 Clustering-domains

- A: North West Europe (70°N , 27.5°W , 40°N , 10°E)
- B: North East Europe (72.5°N , 0°E , 50°N , 45°E)
- C: South West Europe (57.5°N , 15°W , 32.5°N , 17.5°E)
- D: South East Europe (57.5°N , 2.5°E , 32.5°N , 42.5°E)
- E: General European Area (75°N , 20°W , 30°N , 45°E)

2.5 Base times

- 00 UTC, 12 UTC

III–iii: Probabilities

The products provide the probabilities of the occurrence of instantaneous and averaged or accumulated weather events at each grid point. The products are encoded in GRIB form.

3.1 Parameters

III–iii–a) Single level parameters (daily and instantaneous weather events)

- 10 metre Wind speed of at least 10 m/s (10SPG10)
- 10 metre Wind speed of at least 15 m/s (10SPG15)
- Total precipitation of at least 1 mm (TPG1)
- Total precipitation of at least 10 mm (TPG10)
- Total precipitation of at least 20 mm (TPG20)
- Total precipitation of at least 5 mm (TPG5)

III–iii–b) Single level parameters (accumulated weather events)

- Total precipitation less than 0.1 mm (TPL01)
- Total precipitation rate less than 1 mm/day (TPRL1)
- Total precipitation rate of at least 3 mm/day (TPRG3)
- Total precipitation rate of at least 5 mm/day (TPRG5)

III–iii–c) Pressure level parameters (instantaneous weather anomalies)

- Temperature anomaly greater than +4 K (TAG4)
- Temperature anomaly greater than +8 K (TAG8)
- Temperature anomaly less than –4 K (TALM4)
- Temperature anomaly less than –8 K (TALM8)

All parameters are available at levels 850 hPa

III–iii–d) Pressure level parameters (averaged weather anomalies)

- Temperature anomaly less than –2 K (TALM2)
- Temperature anomaly of at least +2 K (TAG2)

All parameters are available at levels 850 hPa

3.2 Product resolution

Leg 1:

- 0.5° x 0.5° lat/long grid or any multiple thereof (global or sub–area)
- On model (Gaussian) N128, N200 grid (global or sub–area)

- Leg 2:**
- 0.5° x 0.5°lat/long grid or any multiple thereof (global or sub–area)
 - On model (Gaussian) N128 grid (global or sub–area)

3.3 Forecast time–steps for daily and instantaneous events

- Leg 1:**
- T+24h to T+240h at 24–hour intervals

- Leg 2:**
- T+264h to T+360h at 24–hour intervals

3.3 Forecast ranges for accumulated or averaged events

- Leg 1:**
- 5 –day period covering 120h < T 240h
 - 2 –day period covering 120h < T 168h
 - 3 –day period covering 168h < T 240h

- Leg 2:**
- 5–day periods: 240h < T 360h

3.4 Base times

- 00 UTC, 12 UTC

III–iv: Time series of weather parameters

The products consist of values of the individual members of the real–time forecast at grid points (single locations). The products are provided in BUFR code.

4.1 Parameters

- 10 metre U–velocity (10U)
- 10 metre V–velocity (10V)
- 10 metre wind gust in the past 6 hours (10FG6)
- 2 metre dewpoint temperature (2D)
- 2 metre temperature (2T)
- Land/sea mask (LSM)
- Maximum temperature at 2m since last 6hours (MX2T6)
- Mean sea level pressure (MSL)
- Minimum temperature at 2m since last 6hours (MN2T6)
- Snow fall (convective + stratiform) (SF)
- Total cloud cover (TCC)
- Total precipitation (TP)

4.2 Product resolution

Option 1:

- On model (Gaussian) N200 grid

Option 2:

- On model (Gaussian) N200 grid for T+0h to T+240h at 6-hour intervals and On model (Gaussian) N128 grid for T+246h to T+360h at 6-hour intervals

4.3 Forecast time-steps

Option 1:

- T+0h to T+240h at 6-hour intervals

Option 2:

- T+0h to T+360h at 6-hour intervals

4.4 Base times

- 00 UTC, 12 UTC

III-v: Extreme Forecast Index

The products provide the extreme forecast index of single level parameters of instantaneous, averaged and accumulated values at each grid point. The products are encoded in GRIB form.

5.1 Parameters

III-v-a) Single level parameters (instantaneous extreme forecast indexes, 00Z)

- 10 metre wind speed index (10WSI)
- 2 metre temperature index (2TI)

III-v-b) Single level parameters (instantaneous extreme forecast indexes, 12Z)

- 10 metre wind speed index (10WSI)
- 2 metre temperature index (2TI)

III-v-c) Single level parameters (accumulated extreme forecast indexes, 00Z)

- Total precipitation index (TPI)

III-v-d) Single level parameters (accumulated extreme forecast indexes, 12Z)

- Total precipitation index (TPI)

III-v-e) Single level parameters (averaged extreme forecast indexes, 00Z)

- 10 metre wind gust index (10FGI)

III–v–f) Single level parameters (averaged extreme forecast indexes, 12Z)

- 10 metre wind gust index (10FGI)

5.2 Product resolution

- 0.5° x 0.5°lat/long grid or any multiple thereof (global or sub–area)

5.3 Forecast time–steps for instantaneous extreme forecast indexes

- T+12h to T+108h at 24–hour intervals (for III–v–a)
- T+24h to T+120h at 24–hour intervals (for III–v–b)

5.4 Forecast ranges for accumulated or averaged extreme forecast indexes

- 1 –day period covering 6h < T 30h (for III–v–c)
- 5 –day period covering 6h < T 126h (for III–v–c)
- 1 –day period covering 30h < T 54h (for III–v–c)
- 5 –day period covering 30h < T 150h (for III–v–c)
- 1 –day period covering 54h < T 78h (for III–v–c)
- 1 –day period covering 78h < T 102h (for III–v–c)
- 1 –day period covering 102h < T 126h (for III–v–c)
- 10 –day period covering 0h < T 240h (for III–v–c)

- 1 –day period covering 18h < T 42h (for III–v–d)
- 5 –day period covering 18h < T 138h (for III–v–d)
- 1 –day period covering 42h < T 66h (for III–v–d)
- 5 –day period covering 42h < T 162h (for III–v–d)
- 1 –day period covering 66h < T 90h (for III–v–d)
- 1 –day period covering 90h < T 114h (for III–v–d)

- 1 –day period covering 114h < T 138h (for III–v–d)
- 10 –day period covering 0h < T 240h (for III–v–d)
- 1–day periods: 0h < T 24h, 24h < T 48h, 48h < T 72h, 72h < T 96h, 96h < T 120h (for III–v–e)
- 1–day periods: 12h < T 36h, 36h < T 60h, 60h < T 84h, 84h < T 108h, 108h < T 132h (for III–v–f)

5.5 Base times

- 00 UTC, 12 UTC

III–vi: Ensemble means

The fields are the means of the ensemble members at each forecast step. The fields are provided in GRIB code.

6.1 Parameters

III–vi) Pressure level parameters

- At 1000, 500 hPa:
 - ◆ Geopotential height (GH)
- At 850, 500 hPa:
 - ◆ Temperature (T)

6.2 Product resolution

Leg 1:

- 0.5° x 0.5°lat/long grid or any multiple thereof (global or sub–area)
- On model (Gaussian) N128, N200 grid (global or sub–area)
- Spectral components (T255, T399) for upper–air fields (global area only)

Leg 2:

- 0.5° x 0.5°lat/long grid or any multiple thereof (global or sub–area)
- On model (Gaussian) N128 grid (global or sub–area)
- Spectral components (T255) for upper–air fields (global area only)

6.3 Forecast time–steps

Leg 1:

- T+6h to T+240h at 6–hour intervals

Leg 2:

- T+246h to T+360h at 6–hour intervals

6.4 Base times

- 00 UTC, 12 UTC

III–vii: Ensemble standard deviations

The fields are the standard deviations of the ensemble members at each forecast step. The fields are provided in GRIB code.

7.1 Parameters

III–vii) Pressure level parameters

- At 1000, 500 hPa:
 - ◆ Geopotential height (GH)
- At 850, 500 hPa:
 - ◆ Temperature (T)

7.2 Product resolution

Leg 1:

- 0.5° x 0.5°lat/long grid or any multiple thereof (global or sub–area)
- On model (Gaussian) N128, N200 grid (global or sub–area)
- Spectral components (T255, T399) for upper–air fields (global area only)

Leg 2:

- 0.5° x 0.5°lat/long grid or any multiple thereof (global or sub–area)
- On model (Gaussian) N128 grid (global or sub–area)
- Spectral components (T255) for upper–air fields (global area only)

7.3 Forecast time–steps

Leg 1:

- T+6h to T+240h at 6–hour intervals

Leg 2:

- T+246h to T+360h at 6–hour intervals

7.4 Base times

- 00 UTC, 12 UTC

Set IV: Products from the Ocean Wave Ensemble Prediction System

The following sub–sets are available from the Ocean Wave Ensemble Prediction System:

- [IV–i: Wave fields](#)
- [IV–ii: Probabilities](#)

For a description, see [Meteorological Bulletin M3.2 User Guide to ECMWF Products](#).

IV–i: Wave fields

The products consist of control and perturbed forecasts plus the equivalent deterministic products. Customers choosing forecast steps from Leg 2 (see below) will receive a high resolution and a low resolution calibration forecast at no extra cost. The deterministic product is suppressed beyond day 10. The fields are provided in GRIB code.

1.1 Parameters

- Maximum individual wave height (HMAX)
- Mean direction of total swell (MDTS)
- Mean direction of wind waves (MDWW)
- Mean period of total swell (MPTS)
- Mean period of wind waves (MPWW)
- Mean wave period (MWP)
- Mean wave period based on second moment (MP2)
- Mean wave period based on second moment for swell (P2PS)
- Mean wave period based on second moment for wind waves (P2WW)
- Peak period of 1D spectra (PP1D)
- Period corresponding to maximum individual wave height (TMAX)
- Significant height of total swell (SHTS)
- Significant height of wind waves (SHWW)
- Significant wave height (SWH)

1.2 Product resolution

Leg 1:

- 1.0° x 1.0°lat/long grid or any multiple thereof (global or sub–area)

Leg 2:

- 1.0° x 1.0°lat/long grid or any multiple thereof (global or sub–area)

1.3 Forecast time–steps

Leg 1:

- T+0h to T+240h at 6–hour intervals

Leg 2:

- T+246h to T+360h at 6–hour intervals

1.4 Base times

- 00 UTC, 12 UTC

IV–ii: Probabilities

The products provide the probabilities of the occurrence of instantaneous and averaged weather events at each grid point. The products are encoded in GRIB form.

2.1 Parameters

IV–ii–a) Single level parameters (instantaneous weather events)

- Significant wave height of at least 2m (SWHG2)
- Significant wave height of at least 4m (SWHG4)
- Significant wave height of at least 6m (SWHG6)
- Significant wave height of at least 8m (SWHG8)

IV–ii–b) Single level parameters (averaged weather events)

- Significant wave height of at least 2m (SWHG2)
- Significant wave height of at least 4m (SWHG4)
- Significant wave height of at least 6m (SWHG6)
- Significant wave height of at least 8m (SWHG8)

2.2 Product resolution

Leg 1:

- 1.0° x 1.0°lat/long grid or any multiple thereof (global or sub–area)

Leg 2:

- 1.0° x 1.0°lat/long grid or any multiple thereof (global or sub–area)

2.3 Forecast time–steps for instantaneous events

Leg 1:

- T+12h to T+240h at 12–hour intervals

Leg 2:

- T+252h to T+360h at 12–hour intervals

2.3 Forecast ranges for averaged events

Leg 1:

- 2 –day period covering 120h < T 168h
- 3 –day period covering 168h < T 240h
- 5 –day period covering 120h < T 240h

Leg 2:

- 5–day periods: 240h < T 360h

2.4 Base times

- 00 UTC, 12 UTC

Set V: Products from the Seasonal Forecasting System

The following sub-sets are available from the Seasonal Forecasting System:

- V-i: Monthly means of ensemble means
- V-ii: Monthly mean anomalies of ensemble means
- V-iii: Monthly means of individual ensemble member forecasts
- V-iv: Monthly mean anomalies of individual ensemble member forecasts
- V-v: Individual forecast runs (daily real-time)

V-i: Monthly means of ensemble means

The following fields are monthly means computed from data of the daily individual forecast runs (section V-v) and averaged over all ensemble members. The fields are provided in GRIB code.

1.1 Parameters

V-i-a) Single level parameters

- 10 metre U-velocity (10U)
- 10 metre V-velocity (10V)
- 2 metre temperature (2T)
- Land/sea mask (LSM)
- Maximum temperature at 2 metres since last 24 hours (MX2T24)
- Mean sea level pressure (MSL)
- Minimum temperature at 2 metres since last 24 hours (MN2T24)
- Orography (Z)
- Sea surface temperature (SSTK)
- Soil temperature level 1 (STL1)
- Total precipitation (TP)

If requested by the user, the land-sea mask (LSM) and the model orography (Z) will be provided free of charge once with every forecast dissemination.

V-i-b) Pressure-level parameters

- *At levels 1000, 925, 850, 700, 500, 200 hPa:*
 - ◆ Geopotential height (GH)
 - ◆ U-velocity (U)
 - ◆ V-velocity (V)
- *At level 850 hPa:*
 - ◆ Temperature (T)

See [appendix](#) for definition and units of the monthly mean parameters given above.

1.2 Product resolution

- 1.5° x 1.5° lat/long grid or any multiple thereof (global or sub-area)
- On model (Gaussian) N80 grid (global or sub-area)
- Spectral components (T159) for upper-air fields (global area only)

1.3 Forecast ranges

- 1 to 7 months

1.4 Base times

- 00 UTC

V-ii: Monthly mean anomalies of ensemble means

The following products correspond to the products in section V-i with the model climate mean subtracted. The model climate is derived from hindcast statistics. The fields are provided in GRIB code.

2.1 Parameters

V-ii-a) Single level parameters

- 10 metre U-velocity (10U)
- 10 metre V-velocity (10V)
- 2 metre temperature (2T)
- Land/sea mask (LSM)
- Maximum temperature at 2 metres since last 24 hours (MX2T24)
- Mean sea level pressure (MSL)
- Minimum temperature at 2 metres since last 24 hours (MN2T24)
- Orography (Z)
- Sea surface temperature (SSTK)
- Soil temperature level 1 (STL1)
- Total precipitation (TP)

If requested by the user, the land-sea mask (LSM) and the model orography (Z) will be provided free of charge once with every forecast dissemination.

V-ii-b) Pressure-level parameters

- *At levels 1000, 925, 850, 700, 500, 200 hPa:*
 - ◆ Geopotential height (GH)
 - ◆ U-velocity (U)
 - ◆ V-velocity (V)
- *At level 850 hPa:*

- ◆ Temperature (T)

See [appendix](#) for definition and units of the monthly mean parameters given above.

2.2 Product resolution

- 1.5° x 1.5° lat/long grid or any multiple thereof (global or sub-area)
- On model (Gaussian) N80 grid (global or sub-area)
- Spectral components (T159) for upper-air fields (global area only)

2.3 Forecast ranges

- 1 to 7 months

2.4 Base times

- 00 UTC

V-iii: Monthly means of individual ensemble member forecasts

The following fields are monthly means computed from data of the daily individual forecast runs (section V-v) for the individual ensemble members. The fields are provided in GRIB code. The product contains the equivalent monthly means of ensemble means (V-i).

3.1 Parameters

V-iii-a) Single level parameters

- 10 metre U-velocity (10U)
- 10 metre V-velocity (10V)
- 2 metre temperature (2T)
- Land/sea mask (LSM)
- Maximum temperature at 2 metres since last 24 hours (MX2T24)
- Mean sea level pressure (MSL)
- Minimum temperature at 2 metres since last 24 hours (MN2T24)
- Orography (Z)
- Sea surface temperature (SSTK)
- Soil temperature level 1 (STL1)
- Total precipitation (TP)
- Volumetric soil water layer 1 (SWVL1)

If requested by the user, the land-sea mask (LSM) and the model orography (Z) will be provided free of charge once with every forecast dissemination.

V–iii–b) Pressure–level parameters

- *At levels 1000, 925, 850, 700, 500, 200 hPa:*
 - ◆ Geopotential height (GH)
 - ◆ U–velocity (U)
 - ◆ V–velocity (V)
- *At level 850 hPa:*
 - ◆ Temperature (T)

See [appendix](#) for definition and units of the monthly mean parameters given above.

3.2 Product resolution

- 1.5° x 1.5°lat/long grid or any multiple thereof (global or sub–area)
- On model (Gaussian) N80 grid (global or sub–area)
- Spectral components (T159) for upper–air fields (global area only)

3.3 Forecast ranges

- 1 to 7 months

3.4 Base times

- 00 UTC

V–iv: Monthly mean anomalies of individual ensemble member forecasts

The following products correspond to the products in section V–iii with the model climate mean subtracted. The model climate is derived from hindcast statistics. The fields are provided in GRIB code. The product contains the equivalent monthly mean anomalies of ensemble means (V–ii).

4.1 Parameters

V–iv–a) Single level parameters

- 10 metre U–velocity (10U)
- 10 metre V–velocity (10V)
- 2 metre temperature (2T)
- Land/sea mask (LSM)
- Maximum temperature at 2 metres since last 24 hours (MX2T24)
- Mean sea level pressure (MSL)
- Minimum temperature at 2 metres since last 24 hours (MN2T24)
- Orography (Z)
- Sea surface temperature (SSTK)
- Soil temperature level 1 (STL1)

- Total precipitation (TP)

If requested by the user, the land–sea mask (LSM) and the model orography (Z) will be provided free of charge once with every forecast dissemination.

V–iv–b) Pressure–level parameters

- *At levels 1000, 925, 850, 700, 500, 200 hPa:*
 - ◆ Geopotential height (GH)
 - ◆ U–velocity (U)
 - ◆ V–velocity (V)
- *At level 850 hPa:*
 - ◆ Temperature (T)

See [appendix](#) for definition and units of the monthly mean parameters given above.

4.2 Product resolution

- 1.5° x 1.5° lat/long grid or any multiple thereof (global or sub–area)
- On model (Gaussian) N80 grid (global or sub–area)
- Spectral components (T159) for upper–air fields (global area only)

4.3 Forecast ranges

- 1 to 7 months

4.4 Base times

- 00 UTC

V–v: Individual forecast runs (daily real–time)

The products contain values for each ensemble member of the Seasonal Prediction System. The fields are provided in GRIB code.

5.1 Parameters

V–v–a) Single level parameters (6 hourly products)

- 10 metre U–velocity (10U)
- 10 metre V–velocity (10V)
- 2 metre temperature (2T)
- Mean sea level pressure (MSL)

The products contain values for write–up times 00, 06, 12 and 18 UTC.

V–v–b) Single level parameters (24 hourly products)

- Land/sea mask (LSM)
- Maximum temperature at 2 metres since last 24 hours (MX2T24)
- Mean 2m temperature in the past 24 hours (MEAN2T24)
- Minimum temperature at 2 metres since last 24 hours (MN2T24)
- Orography (Z)
- Sea surface temperature (SSTK)
- Soil temperature level 1 (STL1)
- Soil temperature level 2 (STL2)
- Soil temperature level 3 (STL3)
- Soil temperature level 4 (STL4)
- Total column water vapour (TCWV)
- Total precipitation (TP)
- Volumetric soil water layer 1 (SWVL1)
- Volumetric soil water layer 2 (SWVL2)
- Volumetric soil water layer 3 (SWVL3)
- Volumetric soil water layer 4 (SWVL4)

The products contain values for write–up times 00 UTC.

V–v–c) Pressure–level parameters (12 hourly products)

- *At levels 1000, 925, 850, 700, 500, 200 hPa:*
 - ◆ Geopotential height (GH)
 - ◆ U–velocity (U)
 - ◆ V–velocity (V)
- *At level 850 hPa:*
 - ◆ Temperature (T)

The products contain values for write–up time 00 and 12 UTC.

If requested by the user, the land–sea mask (LSM) and the model orography (Z) will be provided free of charge once with every forecast dissemination.

5.2 Product resolution

- 1.5° x 1.5° lat/long grid or any multiple thereof (global or sub–area)
- On model (Gaussian) N80 grid (global or sub–area)

5.3 Forecast time–steps

- T+0h to T+5160h at 6–hour intervals for V–v–a)
- T+0h to T+5160h at 24–hour intervals for V–v–b)

- T+0h to T+5160h at 12-hour intervals for V-v-c)

5.4 Base times

- 00 UTC

Appendix

A.1 Definition of the monthly fields

The definition of the month is in accordance to the calendar month of the western calendar

- Monthly means are computed using values at write-up times 00, 06, 12 and 18 UTC for
 - ◆ 2m temperature (K)
 - ◆ 10m U-velocity (m/s)
 - ◆ 10m V-velocity (m/s)
 - ◆ MSLP (Pa)
- Monthly means are computed using values at write-up times 00 and 12 UTC for
 - ◆ Pressure-level parameters
- Monthly means are computed using values at the write-up time 00 for
 - ◆ Sea surface temperature (K)
 - ◆ Soil temperature level 1 (K)
 - ◆ Volumetric soil water layer 1 (m**3 m**-3)
- Monthly mean total precipitation (m/s) is the rate of precipitation during the month.
- Maximum temperature at 2 meters (K) is the monthly mean of the maximum of MX2T (Maximum temperature at 2 meter since last post-processing).
- Minimum temperature at 2 meters (K) is the monthly mean of the minimum of MN2T (Minimum temperature at 2 meters since last post-processing).

Set VI: Products from the Monthly Forecasting System

The following sub-sets are available from the Monthly Forecasting System:

- VI-i: Weekly means of ensemble means (including hindcast products)
- VI-ii: Weekly mean anomalies of ensemble means
- VI-iii: Weekly means of individual ensemble member forecasts (including hindcast products)
- VI-iv: Weekly mean anomalies of individual ensemble member forecasts
- VI-v: Individual forecast runs (daily real-time and hindcast products)
- VI-vi: Probabilities (weekly products)

VI-i: Weekly means of ensemble means (including hindcast products)

The following fields are weekly means computed from data of the daily individual forecast runs (section VI–v) and averaged over all ensemble members. The fields are provided in GRIB code.

1.1 Parameters

VI–i–a) Single level parameters

- 10 metre U–velocity (10U)
- 10 metre V–velocity (10V)
- 2 metre temperature (2T)
- Land/sea mask (LSM)
- Maximum temperature at 2m since last post–processing (MX2T)
- Mean sea level pressure (MSL)
- Minimum temperature at 2m since last post–processing (MN2T)
- Orography (Z)
- Snow fall (convective + stratiform) (SF)
- Soil temperature level 1 (STL1)
- Sunshine duration (SUND)
- Total cloud cover (TCC)
- Total precipitation (TP)

If requested by the user, the land–sea mask (LSM) and the model orography (Z) will be provided free of charge once with every forecast dissemination.

VI–i–b) Pressure–level parameters

- **At levels 1000, 925, 850, 700, 500, 200 hPa:**
 - ◆ Geopotential height (GH)
 - ◆ Temperature (T)
 - ◆ U–velocity (U)
 - ◆ V–velocity (V)
- **At level 200 hPa:**
 - ◆ Stream function (STRF)
 - ◆ Velocity potential (VPOT)

See [appendix](#) for definition and units of the weekly mean parameters given above.

1.2 Product resolution

- 0.5° x 0.5° lat/long grid or any multiple thereof (global or sub–area)
- On model (Gaussian) N128 grid (global or sub–area)
- Spectral components (T255) for upper–air fields (global area only)

1.3 Forecast ranges

- 4 periods of 7 days. The definition of the 4 periods depends on the base time. If the base time is Thursday 00 UTC, it will be day 5–11, day 12–18, day 19–25 and day 26–32.

1.4 Base times

- 00 UTC

VI–ii: Weekly mean anomalies of ensemble means

The following products correspond to the products in section VI–i with the model climate mean subtracted. The model climate is derived from hindcast statistics. The fields are provided in GRIB code.

2.1 Parameters

VI–ii–a) Single level parameters

- 10 metre U–velocity (10U)
- 10 metre V–velocity (10V)
- 2 metre temperature (2T)
- Land/sea mask (LSM)
- Maximum temperature at 2m since last post–processing (MX2T)
- Mean sea level pressure (MSL)
- Minimum temperature at 2m since last post–processing (MN2T)
- Orography (Z)
- Snow fall (convective + stratiform) (SF)
- Soil temperature level 1 (STL1)
- Sunshine duration (SUND)
- Total cloud cover (TCC)
- Total precipitation (TP)

If requested by the user, the land–sea mask (LSM) and the model orography (Z) will be provided free of charge once with every forecast dissemination.

VI–ii–b) Pressure–level parameters

- **At 1000, 925, 850, 700, 500, 200 hPa:**
 - ◆ Geopotential height (GH)
 - ◆ Temperature (T)
 - ◆ U–velocity (U)
 - ◆ V–velocity (V)
- **At 200 hPa:**
 - ◆ Stream function (STRF)
 - ◆ Velocity potential (VPOT)

See [appendix](#) for definition and units of the weekly mean parameters given above.

2.2 Product resolution

- 0.5° x 0.5° lat/long grid or any multiple thereof (global or sub–area)
- On model (Gaussian) N128 grid (global or sub–area)

- Spectral components (T255) for upper-air fields (global area only)

2.3 Forecast ranges

- 4 periods of 7 days. The definition of the 4 periods depends on the base time. If the base time is Thursday 00 UTC, it will be day 5–11, day 12–18, day 19–25 and day 26–32.

2.4 Base times

- 00 UTC

VI–iii: Weekly means of individual ensemble member forecasts (including hindcast products)

The following fields are weekly means computed from data of the daily individual forecast runs (section VI–v) for the individual ensemble members. The fields are provided in GRIB code.

3.1 Parameters

VI–iii–a) Single level parameters

- 10 metre U–velocity (10U)
- 10 metre V–velocity (10V)
- 2 metre temperature (2T)
- Land/sea mask (LSM)
- Maximum temperature at 2m since last post–processing (MX2T)
- Mean sea level pressure (MSL)
- Minimum temperature at 2m since last post–processing (MN2T)
- Orography (Z)
- Snow fall (convective + stratiform) (SF)
- Soil temperature level 1 (STL1)
- Sunshine duration (SUND)
- Total cloud cover (TCC)
- Total precipitation (TP)

If requested by the user, the land–sea mask (LSM) and the model orography (Z) will be provided free of charge once with every forecast dissemination.

VI–iii–b) Pressure–level parameters

- **At 1000, 925, 850, 700, 500, 200 hPa:**
 - ◆ Geopotential height (GH)
 - ◆ Temperature (T)
 - ◆ U–velocity (U)
 - ◆ V–velocity (V)
- **At 200 hPa:**
 - ◆ Stream function (STRF)
 - ◆ Velocity potential (VPOT)

See [appendix](#) for definition and units of the weekly mean parameters given above.

3.2 Product resolution

- 0.5° x 0.5° lat/long grid or any multiple thereof (global or sub-area)
- On model (Gaussian) N128 grid (global or sub-area)
- Spectral components (T255) for upper-air fields (global area only)

3.3 Forecast ranges

- 4 periods of 7 days. The definition of the 4 periods depends on the base time. If the base time is Thursday 00 UTC, it will be day 5–11, day 12–18, day 19–25 and day 26–32.

3.4 Base times

- 00 UTC

VI–iv: Weekly mean anomalies of individual ensemble member forecasts

The following products correspond to the products in section VI–iii with the model climate mean subtracted. The model climate is derived from hindcast statistics. The fields are provided in GRIB code.

4.1 Parameters

VI–iv–a) Single level parameters

- 10 metre U–velocity (10U)
- 10 metre V–velocity (10V)
- 2 metre temperature (2T)
- Land/sea mask (LSM)
- Maximum temperature at 2m since last post–processing (MX2T)
- Mean sea level pressure (MSL)
- Minimum temperature at 2m since last post–processing (MN2T)
- Orography (Z)
- Snow fall (convective + stratiform) (SF)
- Soil temperature level 1 (STL1)
- Sunshine duration (SUND)
- Total cloud cover (TCC)
- Total precipitation (TP)

If requested by the user, the land–sea mask (LSM) and the model orography (Z) will be provided free of charge once with every forecast dissemination.

VI–iv–b) Pressure–level parameters

- At 1000, 925, 850, 700, 500, 200 hPa:
 - ◆ Geopotential height (GH)
 - ◆ Temperature (T)
 - ◆ U–velocity (U)
 - ◆ V–velocity (V)
- At 200 hPa:
 - ◆ Stream function (STRF)
 - ◆ Velocity potential (VPOT)

See [appendix](#) for definition and units of the weekly mean parameters given above.

4.2 Product resolution

- 0.5° x 0.5°lat/long grid or any multiple thereof (global or sub–area)
- On model (Gaussian) N128 grid (global or sub–area)
- Spectral components (T255) for upper–air fields (global area only)

4.3 Forecast ranges

- 4 periods of 7 days. The definition of the 4 periods depends on the base time. If the base time is Thursday 00 UTC, it will be day 5–11, day 12–18, day 19–25 and day 26–32.

4.4 Base times

- 00 UTC

VI–v: Individual forecast runs (daily real–time and hindcast products)

The products contain values for each ensemble member of the Monthly Prediction System plus the equivalent hindcast products. The fields are provided in GRIB code.

5.1 Parameters

VI–v–a) Single level parameters (6 hourly products)

- 10 metre U–velocity (10U)
- 10 metre V–velocity (10V)
- 2 metre temperature (2T)
- Land/sea mask (LSM)
- Maximum temperature at 2m since last post–processing (MX2T)
- Mean sea level pressure (MSL)
- Minimum temperature at 2m since last post–processing (MN2T)
- Orography (Z)

- Sea surface temperature (SSTK)
- Snow fall (convective + stratiform) (SF)
- Soil temperature level 1 (STL1)
- Soil temperature level 2 (STL2)
- Soil temperature level 3 (STL3)
- Soil temperature level 4 (STL4)
- Sunshine duration (SUND)
- Surface pressure (SP)
- Surface solar radiation downwards (SSRD)
- Top thermal radiation (TTR)
- Total cloud cover (TCC)
- Total precipitation (TP)
- Volumetric soil water layer 1 (SWVL1)
- Volumetric soil water layer 2 (SWVL2)
- Volumetric soil water layer 3 (SWVL3)
- Volumetric soil water layer 4 (SWVL4)

If requested by the user, the land–sea mask (LSM) and the model orography (Z) will be provided free of charge once with every forecast dissemination.

VI–v–b) Pressure–level parameters (12 hourly products)

- **At 1000, 925, 850, 700, 500, 200 hPa:**
 - ◆ Geopotential height (GH)
 - ◆ Temperature (T)
 - ◆ U–velocity (U)
 - ◆ V–velocity (V)
- **At 200 hPa:**
 - ◆ Stream function (STRF)
 - ◆ Velocity potential (VPOT)

VI–v–c) Wave model parameters (6 hourly products)

- Significant wave height (SWH)

The wave field significant wave height is archived on a 1.0° x 1.0° grid and will be supplied at that resolution or any multiple thereof (global or sub–area).

5.2 Product resolution

Leg 1:

- 0.5° x 0.5° lat/long grid or any multiple thereof (global or sub–area)
- On model (Gaussian) N200 grid (global or sub–area)
- Spectral components (T399) for upper–air fields (global area only)

Leg 2:

- 0.5° x 0.5° lat/long grid or any multiple thereof (global or sub–area)
- On model (Gaussian) N128 grid (global or sub–area)
- Spectral components (T255) for upper–air fields (global area only)

- Leg 3:**
- 0.5° x 0.5° lat/long grid or any multiple thereof (global or sub-area)
 - On model (Gaussian) N128 grid (global or sub-area)
 - Spectral components (T255) for upper-air fields (global area only)

5.3 Forecast time-steps

Leg 1:

- T+0h to T+240h at 6-hour intervals for VI-v-a and VI-v-c

Leg 2:

- T+246h to T+360h at 6-hour intervals for VI-v-a and VI-v-c

Leg 3:

- T+366h to T+768h at 6-hour intervals for VI-v-a and VI-v-c

Leg 1:

- T+0h to T+240h at 12-hour intervals for VI-v-b

Leg 2:

- T+252h to T+360h at 12-hour intervals for VI-v-b

Leg 3:

- T+372h to T+768h at 12-hour intervals for VI-v-b

5.4 Base times

- 00 UTC

VI-vi: Probabilities (weekly products)

The fields provide the probabilities of the occurrence of weather events at each grid point. Weather events are either averaged or accumulated over a period of one week. The products are provided in GRIB code.

6.1 Parameters

VI-vi-a) Forecast probabilities (weekly averaged)

- 2 metre temperature anomaly of at least +1K (2TAG1)
- 2 metre temperature anomaly of at least +2K (2TAG2)
- 2 metre temperature anomaly of at least 0K (2TAG0)
- 2 metre temperature anomaly of at most -1K (2TALM1)
- 2 metre temperature anomaly of at most -2K (2TALM2)

VI-vi-b) Forecast probabilities (weekly accumulated)

- Total precipitation anomaly of at least 10mm (TPAG10)
- Total precipitation anomaly of at least 20mm (TPAG20)

VI–vi–c) Probability distributions

- 2 metre temperature (2T)
- Total precipitation (TP)

The probability distributions are provided relative to the model climate with respect to terciles (above/near/below normal), quintiles and deciles.

VI–vi–d) Probability boundaries

- 2 metre temperature (2T)
- Total precipitation (TP)

Values of the terciles, quintiles and deciles boundaries are provided.

6.2 Product resolution

- 0.5° x 0.5° lat/long grid or any multiple thereof (global or sub–area)
- On model (Gaussian) N128 grid (global or sub–area)

6.3 Forecast ranges

- 4 periods of 7 days. The definition of the 4 periods depends on the base time. If the base time is Thursday 00 UTC, it will be day 5–11, day 12–18, day 19–25 and day 26–32.

6.4 Base times

- 00 UTC

Set VII: Web Products

Access to all analysis and forecast products on the web is provided on an 'as is' basis; the product range will be adjusted in the light of experience and in response to the evolution of the forecasting system; newly developed products will be added, but others may be discontinued, at the discretion of ECMWF.

ECMWF offers a one week free trial as a registered user to explore the present available web products. Users inside the ECMWF Territory* contact any of the [Catalogue Contact Points](#) and all others contact Data.Services@ecmwf.int for details.

Please check the [list of web products](#) currently available.

For the cost of ECMWF's web products please consult the page [Tariffs](#).

The conditions of the usage of ECMWF's web products can be found [here](#).

*) **ECMWF Territory:** The geographical area covered by the activities of the Member States and Type 1 Co–operating States and composed of their National Territories, and at least the geographical area covered by

the European Economic Area. Currently our Member States are: **Belgium, Denmark, Germany, Spain, France, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Austria, Portugal, Switzerland, Finland, Sweden, Turkey, United Kingdom**; our Co-operating States are **Czech Republic, Estonia, Iceland, Croatia, Hungary, Romania, Serbia and Slovenia**.

Set VIII: Products from the EUROSIP Multi-model Seasonal Forecasting System

The following sub-sets are available from the EUROSIP Multi-model Seasonal Forecasting System:

VIII-i: Multi-model mean of ensemble mean monthly mean anomalies

The following products represent the average of the ensemble mean anomalies from each contributing model. Data from each model are interpolated to a common 2.5 degree grid before the multi-model mean is calculated. The anomaly of each model is with respect to its own model climate, derived from its own re-forecast statistics. The fields are provided in GRIB code.

1.1 Parameters

VIII-i-a) Single level parameters

- 2 metre temperature (2T)
- Mean sea level pressure (MSL)
- Sea surface temperature (SSTK)
- Total precipitation (TP)

VIII-i-b) Pressure-level parameters

- Geopotential height (GH) at level 500 hPa
- Temperature (T) at level 850 hPa
- U-velocity (U) at level 925 hPa
- V-velocity (V) at level 925 hPa

1.2 Product resolution

- 2.5° x 2.5° lat/long grid or any multiple thereof (global or sub-area)

1.3 Forecast ranges

- 1 to 6 months

1.4 Base times

- 00 UTC

Conditions

- a) All requested time steps, parameters and levels are chargeable.
- b) The purchase of the "Basic Set" +72, +96, +120, +144, +168 hrs is a mandatory prerequisite for the purchase of time steps in the range 12 to 66 hours.
- c) No EPU deduction is made for inclusion of WMO Essential Products of the ECMWF.
- d) Ensemble Prediction System products
 - i) Only the whole set of Basic Ensemble Forecasts III i for a given time/field combination will be issued; i.e. output from selected runs of the Ensemble Prediction System will not individually be made available. The Basic Ensemble Forecasts will be issued always in association with the corresponding deterministic output at the same resolution.
 - ii) Basic Ensemble Forecast Products will not be made available on model levels.
 - iii) Cluster mean and standard deviation Products will be considered as two parameters, for all clusters of each field/time combination, when calculating the total EPUs. This will be charged at the basic ECMWF tariff level.
 - iv) Forecast probability Products will be assessed at the rate of one field being equivalent to one parameter when calculating the total number of EPUs. This will then be charged at the basic ECMWF tariff level.
- e) Ocean wave products
 - i) licence costs calculation of wave parameters are based on marine grid points only.
 - ii) Since the parameters included in the Ocean Wave Products include four parameters (wave height, direction and period, and period of 1D–spectra) which are by nature different to the fifth parameter (2D–spectra), the first four parameters will each be priced as one parameter whereas the 2D–spectra will be priced as equivalent to four parameters.
- f) ECMWF's Web Products
 - i) Access to all analysis and forecast products on the web is provided on an "as is" basis; the product range will be adjusted in the light of experience and in response to the evolution of the forecasting system; newly developed products will be added, but others may be discontinued, at the discretion of ECMWF.
 - ii) ECMWF endeavours to provide the products with operational priority, but the entire web service or selected web products may be unavailable for up to 24 hours;
 - iii) Subscribers to the web products may only consult the pages containing the web products by viewing them with a browser; no other downloading aided by computer programs is permitted;
 - iv) Web plots cannot be redistributed or used in any publication, web sites, television broadcasting or any other media;

Delivery Arrangements

Delivery of Products will be arranged by the NMSs or directly by ECMWF for commercial customers outside the Member States.

Licence Arrangements

Licences are available for Service Providers/Broadcasters, End Users, Research Projects or Educational Users as defined hereafter.

Service Provider:

The recipient of Products who uses them in order to Distribute Value Added Services under specific conditions to third parties who are clearly identified and known to the Service Provider.

Broadcaster/Publisher:

The recipient or producer of Value Added Services who provides a service by means of Broadcasting or publishing in any form.

End User:

The recipient of Products or Value Added Services, who uses them for their own commercial, industrial, or personal purposes and does not pass them on to any third party, nor uses them to generate Value Added Services.

Research Project:

Any project organised for non-commercial research purposes only. A necessary condition for the recognition of non-commercial purposes is that all the results obtained are openly available at delivery costs only, without any delay linked to commercial objectives, and that the research itself is submitted for open publication.

Educational Use:

Any use of the Products solely for educational purposes, without passing the Products on to any third party, nor using them to generate Value Added Services.

Individual licences are available from the Catalogue Contact Points listed below or from [ECMWF Data Services](#).

Catalogue Contact Points

Austria:

Ms. Monika Köhler
Central Institute for Meteorology and Geodynamics
Hohe Warte 38
A-1191 Vienna
Tel.: 00 43 1 36 0 26 2002
Fax: 00 43 1 369 1233
e-mail: monika.koehler@zamg.ac.at

Belgium:

Mr. Marc Christiaens
Institut Royal Météorologique
Avenue circulaire 3, B-1180 Brussels
Tel.: 00 32 23 75 24 78
Fax: 00 32 23 75 50 62
e-mail: marc.christiaens@oma.be

Croatia:

Dr. Branka Ivancan-Picek
Hydrometeorological Institute
Gric 3. 41000 Zagreb
Tel.: 00 385 1 4565678
Fax: 00 385 1 4851901
e-mail: picek@cirus.dhz.hr

Czech Republic :

Martin Janousek
Czech Hydrometeorological Institute
Na Sabatce 17
143 06 Praha 4
Tel.: 00 420 2 4403 2242
Fax: 00 420 2 4403 2218
e-mail: martin.janousek@chmi.cz

Denmark:

Lillian Wester-Andersen
Danish Meteorological Institute
100 Lyngbyvej, DK-2100 Copenhagen
Tel.: 00 45 39 15 72 56
Fax: 00 45 39 27 10 80
e-mail: lwa@dmi.dk

Estonia:

Silve Grabbi
Estonian Meteorological and Hydrological Institute
EST-10143 Tallinn
Tel.: 00 372 646 1519
Fax: 00 372 645 4277
e-mail: silve.grabbi@emhi.ee

Finland:

Ms. Lea Leskinen
Finnish Meteorological Institute
P.O. Box 503, FIN-00101 Helsinki 10
Tel: 00 358 9 1929 3380
Fax: 00 358 9 1929 3303
e-mail: lea.leskinen@fmi.fi

France:

Ms. Odile Le Breton
Météo-France
S3C
1, Quai Branly, F-75340 Paris Cédex 07
Tel.: 00 33 1 45 56 71 48
Fax: 00 33 1 45 56 71 70
e-mail: odile.lebreton@meteo.fr

Germany:

Mr. Jürgen Christoffer
Deutscher Wetterdienst, Datenservice
Postfach 10 04 65
D-63004 Offenbach (Main)
Tel.: 00 49 69 80 62 44 78
Fax: 00 49 69 80 62 44 99
e-mail: datenservice@dwd.de

Greece:

Mr. Demetrios Katsimardos
HNMS
P.O. Box 73502, 16603 Hellinikon, Athens
Tel.: 00 30 18 94 94 15
Fax: 00 30 19 64 96 46
e-mail: diso@hnms.gr

Hungary:

Mr. Gabor Kis-Kovacs
Meteorological Service
P.O. Box 38
H-1525 Budapest
Tel.: 00 36 1 346 4664
Fax: 00 36 1 346 4669
e-mail: kiskovacs.g@met.hu

Iceland:

The Icelandic Meteorological Office
Bustaovegur 9, 150 Reykjavik
Tel.: 00 354 522 6000
Fax: 00 354 522 6001

Ireland:

Mr. Joseph Bourke
Met Éireann

Department of Transport, Energy & Communications
Glasnevin Hill, Dublin 9
Tel.: 00 353 1 806 4246
Fax: 00 353 1 806 4247
e-mail: joe.bourke@met.ie

Italy:

TCol Spuri Augusto
TCol Paolo Capizzi
Ufficio Generale per lo Spazio Aereo e Meteorologia
2° Ufficio – Certification and Meteorological cooperation
Palazzo Aeronautica
V.le dell'Universita 4
00185 Roma
Tel: 00 39 06 49 86 70 45/70 46
Fax: 00 39 06 49 86 70 51
e-mail: spuri@meteoam.it, paolo.capizzi@aeronautica.difesa.it

Lithuania:

Mr. Saulius Balys
Lithuanian Hydrometeorological Service
Rudnios str. 6
LT-09300 Vilnius
Tel.: 00 370 5 275 4012
Fax: 00 370 5 272 8874
e-mail: s.balys@meteo.lt

Morocco:

Bouksim Hassan
Chef du Service Prevision Marine
Direction de la Meteorologie Nationale
BP 8106 Oasis
Casablanca
Tel.: 00 212 91 337 8185
Fax: 00 212 22 913 797
e-mail: bouksim@marocmeteo.ma

Netherlands:

Mr. Frank Lantsheer
Head of Model Division
KNMI
P.O. Box 201, 3730 AE de Bilt
Tel.: 00 31 303 2206527
Fax: 00 31 302211371
e-mail: Frank.Lantsheer@knmi.nl

Norway:

Ms. Lillian Svendsen
Norwegian Meteorological Institute
P.O. Box 43 Blindern, N-0313 Oslo 3
Tel.: 00 47 22 96 30 00
Fax: 00 47 22 96 30 50

e-mail: lillian.svendsen@dnmi.no

Portugal:

Ms. Ana Nascimento
Instituto de Meteorologia
Rua C ao Aeroporto,
P – 1749 – 077 Lisboa
Tel.: 00 351 21 84 47 000 – ext 1530
Fax: 00 351 21 84 02 370
e-mail: ana.nascimento@meteo.pt

Romania:

Dino Marasoiu
National Meteorological Administration
Sos. Bucuresti–Ploiesti 97
013686 Bucharest
Tel.: 00 402 1230 3240 213
Fax: 00 402 1230 3143
e-mail: dino.marasoiu@meteo.inmh.ro

Serbia:

Ms. Dara Mirilovic
Republican Hydrometeorological Service of Serbia
Kneza Visaslava 66
11030 Belgrade
Tel: +381 11 2413966 ext 135
Fax: +381 11 545378
e-mail: dmirilovic@hidmet.sr.gov.yu

Slovenia:

Mr. Branko Gregorcic
Environmental Agency of the Republic of Slovenia
Vojkova 1b
1000 Ljubljana
Tel.: 00 386 1 478 41 35
Fax: 00 386 1 478 40 33
e-mail: branko.gregorcic@rzs-hm.si

Spain:

Mr. Francisco Pascual
International Department
Instituto Nacional de Meteorologia
Tel.: 00 34 91 581 9642
Fax: 00 34 91 581 9896
e-mail: fcopascual@inm.es

Sweden:

Ms. Gunlög Wennerberg
SMHI
S-601 76 Norrköping
Tel.: 00 46 11 495 8365
Fax: 00 46 11 495 8001

e-mail: Gunlog.Wennerberg@smhi.se

Switzerland:

Mr. Alex Rubli
MeteoSchweiz
Krähbühlstrasse 58
CH-8044 Zürich
Tel.: 00 41 44 256 9263
Fax: 00 41 44 256 9666
e-mail: alex.rubli@meteoswiss.ch

Turkey:

Mr. Ali Demirel
Devlet Meteoroloji Isleri Genel Müdürlüğü
P.K. 401 Ankara
Tel.: 00 90 43 14 16 16
Fax: 00 90 31 23 59 34 30
e-mail: a.demirel@meteor.gov.tr

United Kingdom:

Mr Colin Cuthbert
Data Manager
Met Office
Fitroy Road
Exeter, Devon, EX1 3PB
Tel.: 00 44 1392 884678
Fax: 00 44 1392 885681
e-mail: ccuthbert@metoffice.com

Tariffs

A revised costing system came into force on **1st of September 2004**.

- [Introduction](#)
- [Research Project and Educational Use](#)
- [Rules of the Cost Calculation](#)
- [Reduced Licence fees for small service providers](#)
- [Tariffs of Web Products](#)
- [Other rules \(applicable to all Data Sets\)](#)
- [Licence Agreements](#)

1. Introduction

Except where explicitly stated, this tariff refers only to the information component of the total price. Handling and delivery costs will be added, together with [Internet Broadcast Fee](#) where applicable.

2. Research Project and Educational Use

The information cost will be set to zero EUR. Any handling and delivery costs will be charged to the Research Project or Educational user.

3. Rules of the Costs Calculation

3.1 Basic concepts

The tariff for ECMWF Products is evaluated on the basis of an 'information unit' introduced by ECOMET, the EPU (ECOMET Product Unit).

The tariff is based on the cost of a global field at the resolution of the Centre's current resolution of the **operational deterministic atmospheric model**, independent of its representation (spherical harmonics, regular and reduced Gaussian grid, regular latitude–longitude grid).

A unit price per EPU is applied to all Products in the Catalogue. ([See 4.1](#))

3.2 Priced Items

An *item* is defined as one or more fields that are priced as one entity.

Below are the definitions of *item* based on the different Product Sets defined in the Catalogue:

Product Set		Definition of <i>item</i> for Deterministic forecast
I-i	Atmospheric fields	A single field
I-ii	Time series	Please go to the end of subsection 3.2
II-i	Global waves	A single field. The 2D–wave spectra (all frequencies and directions) corresponds to 10 items.

<u>II–ii</u>	<u>European waves</u>	A single field. The 2D–wave spectra (all frequencies and directions) corresponds to 10 items.
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Product Set		Definition of <i>item</i> for Ensemble Prediction System
<u>III–i</u>	<u>Atmospheric fields</u>	All members for each field including perturbed and control forecasts and the equivalent deterministic product (same resolution).
<u>III–ii</u>	<u>Clusters</u>	All cluster members for each field
<u>III–iii</u>	<u>Probabilities</u>	A single field
<u>III–iv</u>	<u>Time series</u>	Please go to the <u>end of subsection 3.2</u>
<u>III–v</u>	<u>Extreme Forecast Indexes</u>	A single field
<u>III–vi</u>	<u>Ensemble means</u>	A single field
<u>III–vii</u>	<u>Ensemble standard deviations</u>	A single field
<u>IV–i</u>	<u>Wave fields</u>	All members for each field including perturbed and control forecasts and the equivalent deterministic product (same resolution).
<u>IV–ii</u>	<u>Probabilities</u>	A single field

Product Set		Definition of <i>item</i> for Seasonal Forecast
<u>V–i</u>	<u>Monthly means of ensemble means</u>	A single field
<u>V–ii</u>	<u>Monthly mean anomalies of ensemble means</u>	A single field
<u>V–iii</u>	<u>Monthly means of individual ensemble member forecasts</u>	All the monthly means for each field and the monthly means of ensemble means (V–i).
<u>V–iv</u>	<u>Monthly mean anomalies of individual ensemble member forecasts</u>	All the monthly means for each field and the equivalent monthly mean anomalies of ensemble means (V–ii).
<u>V–v</u>	<u>Individual forecast runs (real–time)</u>	All the ensemble members within one day for each field.

Product Set		Definition of <i>item</i> for Monthly Forecast
<u>VI–i</u>	<u>Weekly means of ensemble means</u>	A single field and the equivalent hindcast data
<u>VI–ii</u>	<u>Weekly mean anomalies of</u>	A single field

	<u>ensemble means</u>	
<u>VI-iii</u>	<u>Weekly means of individual ensemble member forecasts</u>	All the weekly means for each field and the equivalent hindcast data.
<u>VI-iv</u>	<u>Weekly mean anomalies of individual ensemble member forecasts</u>	All the weekly means for each field.
<u>VI-v</u>	<u>Individual forecast runs (real-time and hindcast)</u>	All the ensemble members including perturbed and control forecasts for each field and the equivalent hindcast data.
<u>VI-vi</u>	<u>Probabilities</u>	A single field
<u>VI-vii</u>	<u>Time series</u>	Please go to the <u>end of subsection 3.2</u>

Product Set		Definition of <i>item</i> for EUROSIP
<u>VIII-i</u>	<u>Multi-model mean of ensemble mean monthly mean anomalies</u>	A single field

Price of Time Series

For a given dataset, the cost of a time-series is set to the cost of 8 parameters from the dataset, at full resolution, at all time steps in the time-series over the minimum area ([See 3.5](#)).

3.3 Time unit

The costing of data will be based on a time unit of :

- hours for medium-range forecasts
- days for monthly and seasonal forecasts with more frequent write-ups provided at no further information charge.
- months for monthly mean data from seasonal forecasts
- weeks for weekly mean data from monthly forecasts

3.4 Unified costing formula

The price of a requested item is based on the following formula:

$$EPU \text{ per item} = B * A * R * E * V * D * M$$

where

- **B** is the base cost, set to 20 EPU;
- **A** is the area factor, which is the ratio between the area provided and the area of the globe. For ocean wave fields, this factor will in addition take into account the land/sea ratio over the provided area
- **R** is the resolution factor, defined as the ratio between the resolution of the Centre's high-resolution operational model and the resolution provided;

- **E** is the ensemble factor, set to 1.4 see table below;
- **V** is the valid factor, set to 1 for real–time data and set to 0.2 for archive data;
- **M** is the multi–model ensemble (MME) factor, set to 1 for ECMWF products and to 1.4 for EUROSIP products;
- **D** is the dataset factor, defined as follows:

	Set Number	Product Set	D	E
Medium–range forecast	I–i	Fields from the deterministic atmospheric model	1	1
	II–i	Fields from the global ocean wave model	1	1
	II–ii	Fields from the European waters ocean wave model	1	1
	III–i	Fields from the atmospheric EPS	1	1.4
	III–ii	Clusters from the atmospheric EPS	1	1
	III–iii	Probabilities from the atmospheric EPS	1	1
	III–v	Extreme Forecast Indexes from the atmospheric EPS	1	1
	III–vi	Ensemble means from the atmospheric EPS	1	1
	III–vii	Ensemble standard deviations from the atmospheric EPS	1	1
	IV–i	Fields from the ocean wave EPS	1	1.4
	IV–ii	Probabilities from the ocean wave EPS	1	1
Seasonal forecast	V–i	Monthly means of ensemble means	40	1
	V–ii	Monthly mean anomalies of ensemble means	80	1
	V–iii	Monthly means of individual ensemble member forecasts	40	1.4
	V–iv	Monthly mean anomalies of individual ensemble member forecasts	80	1.4
	V–v	Individual forecast runs (daily real–time)	2	1.4
Monthly forecast	VI–i	Weekly means of ensemble means	15	1
	VI–ii	Weekly mean anomalies of ensemble means	30	1
	VI–iii	Weekly means of individual ensemble member forecasts	15	1.4
	VI–iv	Weekly mean anomalies of individual ensemble member forecasts	30	1.4
	VI–v	Individual forecast runs (daily real–time and hindcast products)	1	1.4
	VI–vi	Probabilities	1	1
EUROSIP	VIII–i	Multi–model mean of ensemble mean monthly mean anomalies	80	1

Examples for the unified costing formula can be found [here](#).

3.5 Minimum area

It is proposed to set the minimum area to 6 square degrees of latitude/longitude. The minimum area will not apply to archived data.

3.6 Seasonal Hindcast Products

Seasonal hindcast data are available from the Catalogue of ECMWF model archived data and products at data handling charge only, if purchased as part of and for the same products as, the real-time licence.

4. Reduced Licence fees for small service providers

The annual licence fees for the provision of ECMWF real-time data to small service providers is set to:

<i>Condition to be fulfilled</i>	<i>Reduced annual licence fee</i>
$T < 3 X$	$X/3$
$3 X < T < 9 X$	$T/9$
$9 X < T$	No reduction

where:

X ... unreduced annual licence fee

T ... annual turnover of the licensee's company (calendar or financial year)

The reduction would not apply to maximum information charges, or to the additional fee for Internet broadcasting or handling and delivery charges.

5. Tariffs of Web Products

The ECMWF's web products are available as a whole on an "as is" basis at a price of 28,000.00 EUR (20% of the maximum charge of 140,000.00 EUR) for all commercial users. For users paying the maximum charge the access to the web products is included.

6. Other rules (applicable to all data sets)

6.1 Unit Price (P)

A unit price of **P = 0.70 EUR per EPU** is applied to all Products in the Catalogue.

6.2 Maximum charge after application of discount

A maximum charge of **140,000 EUR** per year will be applied.

6.3 Information charge for archived data for maximum charge customer

The access to the ECMWF archive for customers of real-time products paying the maximum charge will be given without Information Charge but at appropriate Handling Charge, depending on their use of the archive.

6.4 Volume discount

The following discount scheme, based on the unit price **P = 0.70 EUR**, applies.

Number of chargeable EPU's per year [N]	Discount Price [EUR]
0 – 2,000	$N \times P$
2,001 – 20,000	$[2,000 + 0.6 (N - 2,000)] \times P$
20,001 – 200,000	$[12,800 + 0.4 (N - 20,000)] \times P$
200,001 and more	$[84,800 + 0.2 (N - 200,000)] \times P$

6.5 Volume limit for maximum charge customer

Maximum charge customers may retrieve up to 75 GB per day without any additional charges via the Centre's Internet link; appropriate handling charges apply if a maximum charge customer regularly exceeds the 75 GB limit.

7. Specific tariffs under Agreements 1BI (Service Provider) and 1BII (Broadcaster)

The licence fee to be paid by Service Providers or Broadcasters for the use of Catalogue items will be composed of the following elements:

- An Information Charge as determined by the Catalogue tariff above. For Service Providers this will include the right to use ECMWF Type A Products in order to create and provide any Type B Value Added Service to end users and broadcasters;
- If required, an Additional Internet Broadcast Fee (AIBF) for the right to use ECMWF Type A Products in order to redistribute Type B Value Added Services on the open Internet.

The Additional Internet Broadcast Fee (AIBF) shall amount to 50% of the Information Charge, as determined by the Catalogue tariff above, and shall be charged in addition to the Information Charge. The Additional Internet Broadcast Fee shall be applied only to the ECMWF Type A Products used for the redistribution of Type B Value Added Services on the open internet and be limited to 50% of the maximum Information Charge (see 6.2). The maximum combined Information Charge and the AIBF is therefore 150% of the maximum Information Charge. The AIBF will not be subject to the reduction of the Information Charge for small service providers.