

# Data services for ERA-40

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## Data Services for ERA-40:

### Access to ERA-40 data

- Data Services at ECMWF
- General rules for ERA-40
- Specific data set

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## Archiving at ECMWF

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- Archiving NWP data for the benefit of its Member States is one of the mission given to ECMWF in its convention
- This activity was run since the very beginning
- Today the total archive reaches 500 TeraBytes
- This includes a Disaster Recovery System installed in a different building

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## Access to the ECMWF archive

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- ECMWF has developed an access to the archive for Member States: the Meteorological Archiving and Retrieval System (MARS)
- MARS is available to agreed Member States users only, either through the RMDCN or the Internet
- Since the beginning ECMWF developed Data Services in order to give access for research users:
  - at handling cost
  - limited to specific dataset: TOGA, ERA-15, Waves, ...  
*Note that Data Services is a self-funded activity*

## Data Services at ECMWF

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- New rules concerning access to archived data adopted in 2000:
  - The whole of the NWP archive available
  - Tariff includes Information Charge and Handling Cost
  - No Information Charge for research users
  - Handling Cost re-estimated (almost halved)
- Website developed recently: [www.ecmwf.int/services/data](http://www.ecmwf.int/services/data)
- Other developments under way, in particular on line costing and ordering system under

## ERA-40

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- An EU funded project
- Termination expected mid 2003
- Will hold 40 TeraBytes of data (~60,000 CDRoms)
- EU agreement included notion of affordable dataset
- 3D-Var, T<sub>L</sub>159L60 (120 km, 60 levels)
- <http://www.ecmwf.int/research/era/>

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## ERA-40 Data Policy

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- Available in MARS to Member States (and Co-operating States) users
- Available from Data Services at Handling Cost for research and education projects (National redistribution organised in some Member States: BADC, DKRZ, ...)
- Available at full cost for other uses
- A substantial subset available from NCAR to authorised end users (UCAR community and North-American researchers)
- Specific dataset available for free or at reduced cost for research
- Availability of ERA-40 observations under consideration with providers

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## Specific dataset

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- A basic dataset available on line or as a set of CDROM (~5)
- Yearly dataset on CDROM (1 CD/Year)
  - Cost 20£/CD, minimum order 100£
- A monthly mean CDROM
  - Cost 40£
- Time series at full resolution (1.125°)
  - Cost 300£/GB, sub-area possible (1/order), minimum charge 200£
- Dedicated dataset: CDROM dataset developed in co-operation with a specific research community

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## Basic Dataset

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- On line or as a set of CDROMs (tbd)
- 3.5 GB
- 11 fields/day
- 2.5° resolution
- Z500, T850, U-V 200 & 850, RH700, MSLP, TP, TCO<sub>3</sub>, TCC
- For free

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## Yearly Dataset

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- Z 10, 50, 200, 500, 850, 1000 hPa
- T 10, 30, 50, 100, 200, 300, 500, 700, 850, 925 hPa
- U-V 10, 30, 50, 100, 200, 300, 500, 700, 850 hPa
- RH 300, 500, 700, 850, 925 Hpa
- all fields up to 500 Hpa at 00 UTC and 12 UTC, 00 UTC above
  
- Surface fields: U-V<sub>10m</sub>, T<sub>2m</sub>, Td<sub>2m</sub>, SST/TST, MSLP, TP<sub>24h</sub>
- Integrated fields: TCC, TCWV, TCO<sub>3</sub>
- PV=2 fields: P, PT
  
- 1 CD/year, max 88 fields, **11 additional fields possible**
  
- Cost 20£/CD, minimum order 100£

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## Monthly Means Dataset

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- Z 10, 50, 200, 500, 850, 1000 hPa
- T 10, 30, 50, 100, 200, 300, 500, 700, 850, 925 hPa
- U-V 10, 30, 50, 100, 200, 300, 500, 700, 850 hPa
- RH 300, 500, 700, 850, 925 hPa
  
- Surface fields: MSLP, U-V<sub>10m</sub>, WS<sub>10m</sub>, T<sub>2m</sub>, Td<sub>2m</sub>, SST/TST, TP<sub>24h</sub>  
Turb. & Rad. Fluxes, Stress, Evap.
- TOA fields: Net SW Rad., Outgoing LW Rad.
- Integrated fields: TCC, TCWV, TCO<sub>3</sub>
  
- 1 CDROM, **6 additional fields possible**
  
- Cost 40£

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## Time series

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- Pre-prepared dataset allowing reduced handling cost
- List as agreed with ERA user committee  
see <http://www.ecmwf.int/research/era/products>
- Cost 300£/GB, sub-area possible (1/order), minimum charge 200£

## Dedicated dataset

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- Selected CDROM dataset for an identified research community
- One currently developed with NASA-ISLSCP
- Guidelines:
  - developed in co-operation with ECMWF
  - CDROM or equivalent
  - identified and responsible partner
  - who funds the recording, printing, ...
  - Handling Cost paid once
  - distribution allowed within the community by partner
  - and by ECMWF
- other such dataset envisaged: waves, climatology, snow, ozone

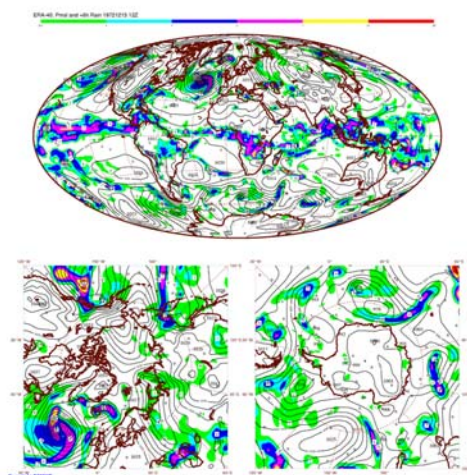
## Plots on ECMWF's Website

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- Daily fields: 3 images/day, 2 fields/image, different areas
- data coverage plots and statistics
- Examples hereafter

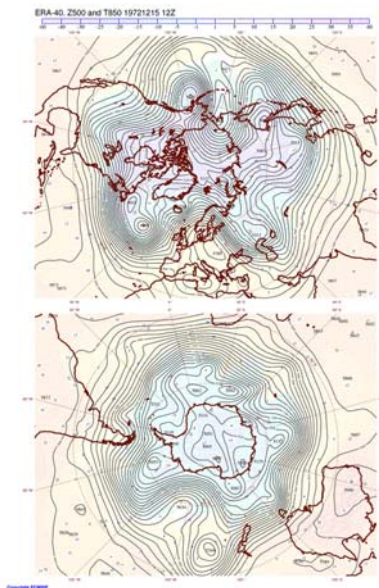
## ERA-40 Plots

- PMSL, 6h Rain, G
- PMSL, 6h Rain, NP
- PMSL, 6h Rain, SP
- 15 / 12 / 1972 , 12 UTC



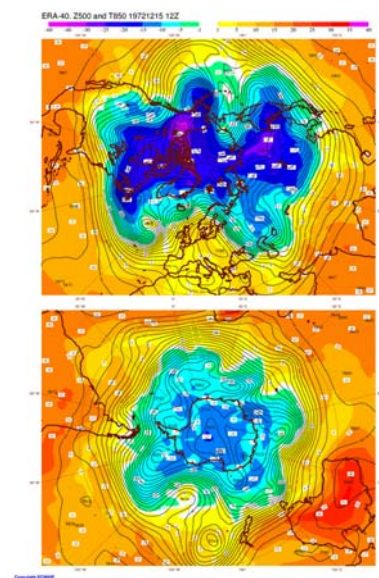
## ERA-40 Plots

- Z 500, T 850, NH
- Z 500, T 850, SH
- 15 / 12 / 1972 , 12 UTC



## ERA-40 Plots

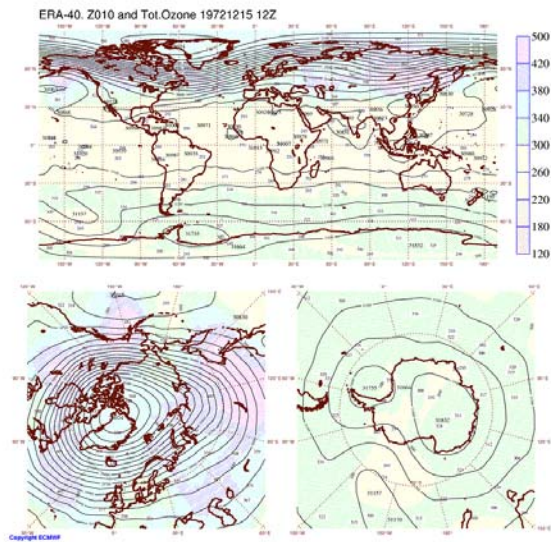
- Z 500, T850, NH
- Z 500, T850, SH
- 15 / 12 / 1972 , 12 UTC





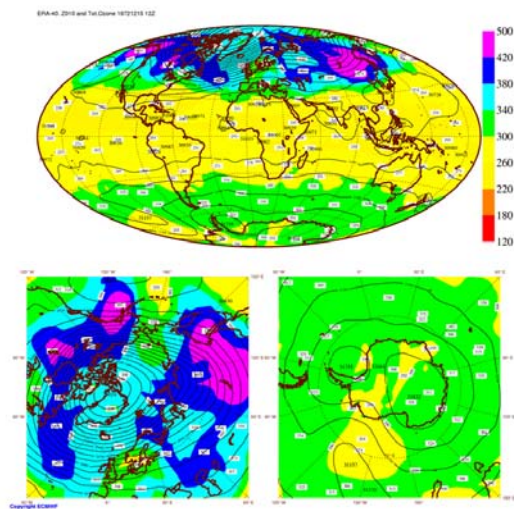
## ERA-40 Plots

- Z 10, TCO<sub>3</sub>, G
- Z 10, TCO<sub>3</sub>, NP
- Z 10, TCO<sub>3</sub>, SP
- 15 / 12 / 1972, 12 UTC



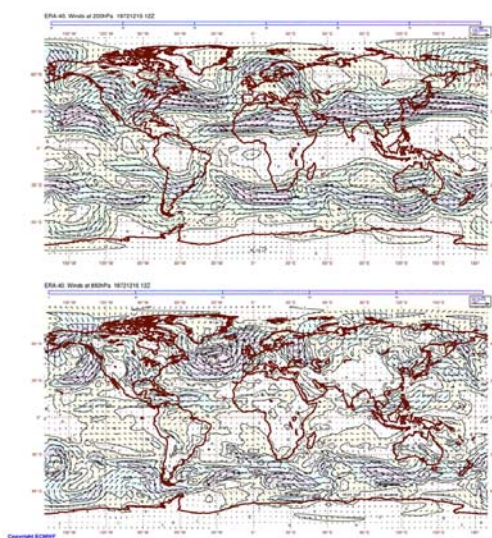
## ERA-40 plots

- Z 10, TCO<sub>3</sub>, G
- Z 10, TCO<sub>3</sub>, NP
- Z 10, TCO<sub>3</sub>, SP
- 15 / 12 / 1972, 12 UTC

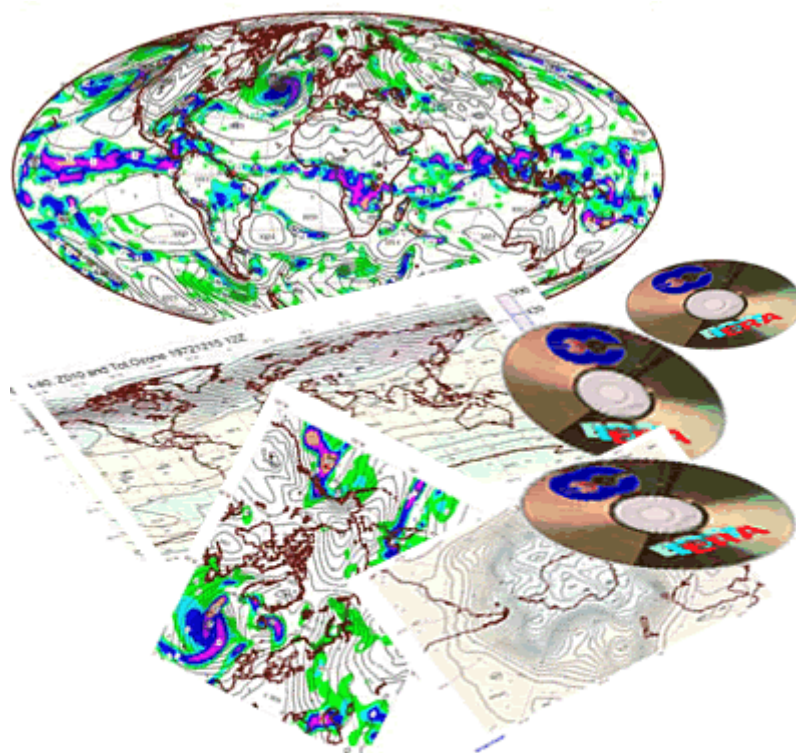


## ERA-40 Plots

- Winds 200 Hpa, G
- Winds 850 Hpa, G
- 15 / 12 / 1972 , 12 UTC



## ANNEX



# ERA-40

## Proposed Contents of Specific Data Sets

## 1. ERA-40 proposed contents of yearly CD

Resolution 2.5°

Level (hPa)	00UTC	12UTC	Parameter	Number of fields
10	x		Z, T, U, V	4
30	x		T, U, V	3
50	x		Z, T, U, V	4
100	x		T, U, V	3
200	x		Z, T, U, V	4
300	x		T, U, V, RH	4
500	x	x	Z, T, U, V, RH	10
700	x	x	T, U, V, RH	8
850	x	x	Z, T, U, V, RH	10
925	x	x	T, RH	4
1000	x	x	Z	2
			<b>Subtotal</b>	<b>56</b>
Surface	x	x	10m U,V	4
Surface	x	x	2m Dew Point Temperature	2
Surface	x		SST/ Top Soil Temperature	1
Surface	x	x	2m Temperature	2
Surface	x	x	Mean Sea Level Pressure	2
Surface	x		Daily Evaporation	1
Surface	x		Total Daily Precipitation	1
Integral	x		Total Column Water Vapour	1
Integral	x	x	Total Cloud Cover	2
Integral	x		Total Column Ozone	1
PV=2	x	x	Pressure, Potential Temperature	4
			Subtotal	<b>21</b>
			<b>TOTAL</b>	<b>77</b>

Volume available for 11 additional fields

## 2. ERA-40 proposed contents of Monthly Means CD

Resolution 2.5°

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Level	Parameter	Number of fields
hPa		
10	Z, T, U, V	4
50	Z, T, U, V	4
100	T, U, V	3
200	Z, T, U, V	4
300	T, U, V, RH	4
500	Z, T, U, V, RH	5
700	T, U, V, RH	4
850	Z, T, U, V, RH	5
925	T, RH	2
1000	Z	1
	<b>Subtotal</b>	<b>36</b>
Surface	Mean Sea Level Pressure	1
Surface	10m U, V, Speed	3
Surface	2m Temperature	1
Surface	2m Dew Point Temperature	1
Surface	SST/Top Soil Temperature	1
Surface	Turbulent & Radiative Fluxes	4
Surface	Total Precipitation	1
Surface	Evaporation	1
Surface	Stress (U/V flux)	2
TOA	Net Short-Wave Radiation	1
TOA	Outgoing Long-Wave Radiation	1
Integral	Total Column Water Vapour	1
Integral	Total Cloud Cover	1
Integral	Total Column Ozone	1
	Subtotal	<b>20</b>
	<b>TOTAL</b>	<b>56</b>

Volume available for 6 additional fields

### 3. ERA-40 proposed contents of Time Series Data Set

Resolution 1.125°

Parameters		
500hPa geopotential	eastward wind component on PV=±2	2 metre dewpoint
200hPa geopotential	northward wind component on PV=±2	downward surface solar radiation
850 hPa temperature	pressure on PV=±2	surface solar radiation
850hPa eastward wind component	mean sea level pressure	surface thermal radiation
200hPa eastward wind component	total column water vapour	top solar radiation
850hPa northward wind component	eastward water-vapour flux	top thermal radiation
200hPa northward wind component	northward water-vapour flux	evaporation
925hPa specific humidity	soil temperature level 1	maximum 2m temperature over last six hours
850hPa vorticity	sea-ice fraction	minimum 2m temperature over last six hours
200hPa vorticity	soil moisture level 1	total column ozone
850hPa divergence	soil moisture level 2	boundary layer height
200hPa divergence	soil moisture level 3	wind gusts at 10 metres
potential vorticity on 330K surface	soil moisture level 4	significant wave height
eastward wind component on 330K	snow depth	mean wave direction
northward wind component on 330K	large-scale precipitation	mean wave period
vorticity on 330K	convective precipitation	
divergence on 330K	surface sensible heat flux	
pressure on 330K	total cloud cover	
potential temperature on PV=±2 surface	10 metre eastward wind component	
eastward wind component on PV=±2	10 metre northward wind component	
northward wind component on PV=±2	2 metre temperature	

## ERA-40 proposed contents of basic Data Set

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Resolution 2.5°

Level (hPa)	Parameter	Number of fields
200	U,V	2
500	Z	1
700	RH	1
850	T, U, V	3
	<b>Subtotal</b>	<b>7</b>
Surface	Mean Sea Level Pressure	1
Surface	Total Precipitation	1
Integral	Total Cloud Cover	1
Integral	Total Column Ozone	1
	Subtotal	<b>4</b>
	<b>TOTAL</b>	<b>11</b>

