

Recommendations and efficiency tips for C3S seasonal forecast datasets

• Horizontal grid interpolation

Currently the interactive CDS forms don't allow users to perform an interpolation of the selected data. However, that action can be performed using the CDS API keyword **grid** with the same syntax used by ECMWF MARS and Web API.

```
import cdsapi

c = cdsapi.Client()

c.retrieve(
    'seasonal-monthly-single-levels',
    {
        'format': 'grib',
        'originating_centre': 'cmcc',
        'system': '3',
        'variable': '2m_temperature',
        'product_type': 'monthly_mean',
        'year': '2007',
        'month': '11',
        'leadtime_month': ['1', '2', '3', '4', '5', '6'],
        'area': '75/-25/10/60', # 'North/West/South/East' (i.e. 'top-left corner lat/top-left corner lon/bottom-right corner lat/bottom-right corner lon'
        'grid': '2.5/2.5' # Interpolate to a regular 2.5x2.5 degree horizontal grid
    },
    'download.grib')
```

More details about the syntax of **grid** in MARS/WebAPI can be found [here](#).

Users must be aware of the following:

- Use of **grid** for horizontal interpolation is currently **NOT recommended**:
 - It can lead to errors when trying to download MetOffice data produced before January 2018 (system=12). More information about what causes this error can be found in [Known issue D2](#).
 - It can lead to failing data retrievals if more than one model version (**system**) is requested. Note that if **system** is not explicitly specified it defaults to all available systems.
 - Access to C3S seasonal data was also available through ECMWF Web API until 5 March 2019. Data previously downloaded using that Web API access may have used a different interpolation method; you would need to assess whether such differences are relevant for your choice of data. This issue is relevant in the context of the required consistency between interpolation of real-time forecasts and the associated hindcasts.

• Conversion to NetCDF

Users must be aware that conversion to NetCDF is considered experimental and it is not guaranteed to work in all situations.

In this context,

- It is **NOT recommended** to include in a single request more than one model version (**system**). Note that for hindcasts, data from more than one **system** may exist in the archive.
- It is **NOT recommended** to include in a single request data related to more than one start time.

• Efficiency tips

The C3S seasonal forecast dataset is currently based on GRIB files archived at ECMWF's MARS archive. This implies, in some situations, accessing data not available online (on disk) but archived in the tape library.

The way the user selects the items to include in a single request can make a huge difference in the performance of the retrieval. To improve performance:

- Users are encouraged to explore the C3S catalogue using the former Web API catalogue tool here: <https://apps.ecmwf.int/data-catalogues/c3s-seasonal/?class=c3>
All the data shown at the same time in a window like the picture below, constitutes a "leaf" in the MARS "tree". This is usually guaranteed to be in a single archived file, and hence in one single tape.
Users are encouraged to

- combine in one single request all the data they are interested in which is contained in the same MARS "leaf"
- avoid combining data from two different "leaves".


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Current activity
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C3S Seasonal Catalogue

Date (5 values)	Time (1 values)	Forecast month (6 values)	Number (30 values)	Parameter (31 values)
2008-01-01	00:00:00	1	0	2 metre dewpoint temperature
2008-02-01		2	1	2 metre temperature
2008-03-01		3	2	10 metre U wind component
2008-11-01		4	3	10 metre V wind component
2008-12-01		5	4	10 metre wind speed
		6	5	Convective precipitation
			6	East-West surface stress rate of accumulation
			7	Evaporation
			8	Maximum temperature at 2 metres in the last 24 hours
			9	Mean sea level pressure

- [Check for availability](#)
- [View the MARS request](#)

See [how to download](#) the selected data above.

Current selection

levtype: **pl, sfc**

method: **1**

system: **2**

origin: **cmcc, ecmf, edzw, egr, ifpw**

year: 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, **2008**, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018

type: **em, fcmx, fcmx, fcmx, fcmx, fcmx**

expver: **1**

stream: **mmsa, mmsf, mmmm**

class: **c3**

- Users are encouraged to devise their requests as follows:
 - Do NOT ask for different start months in the same request when retrieving data from the "daily" datasets. It is much more efficient to request one single month (e.g. November) for all the hindcast years (1993 to 2016) than requesting all 12 months from a single year
 - Combine in one single request all variables of interest, all levels (for pressure level fields), all product types and all leadtimes (hours or months, depending on the CDS product). **However**, note that there are some limitations in the size of a request. If you are using the CDS forms directly, you will be informed when you request is too big before submitting it. If you are using CDS API you can use the forms to discover whether the request you are trying to submit is affordable or not.

• Guidelines to decode monthly data

More information [here](#).



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