



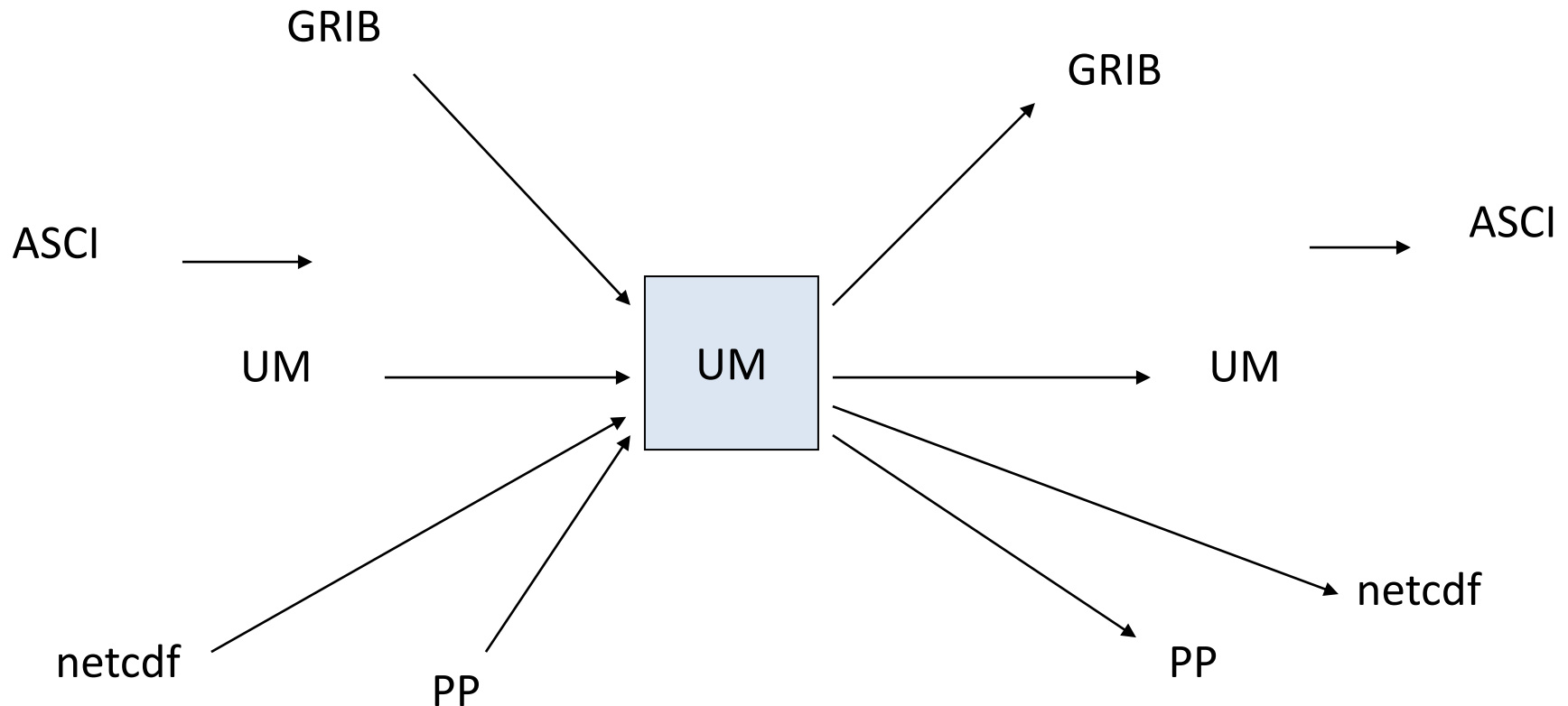
# **NCAS**

# **Unified Model Introduction**

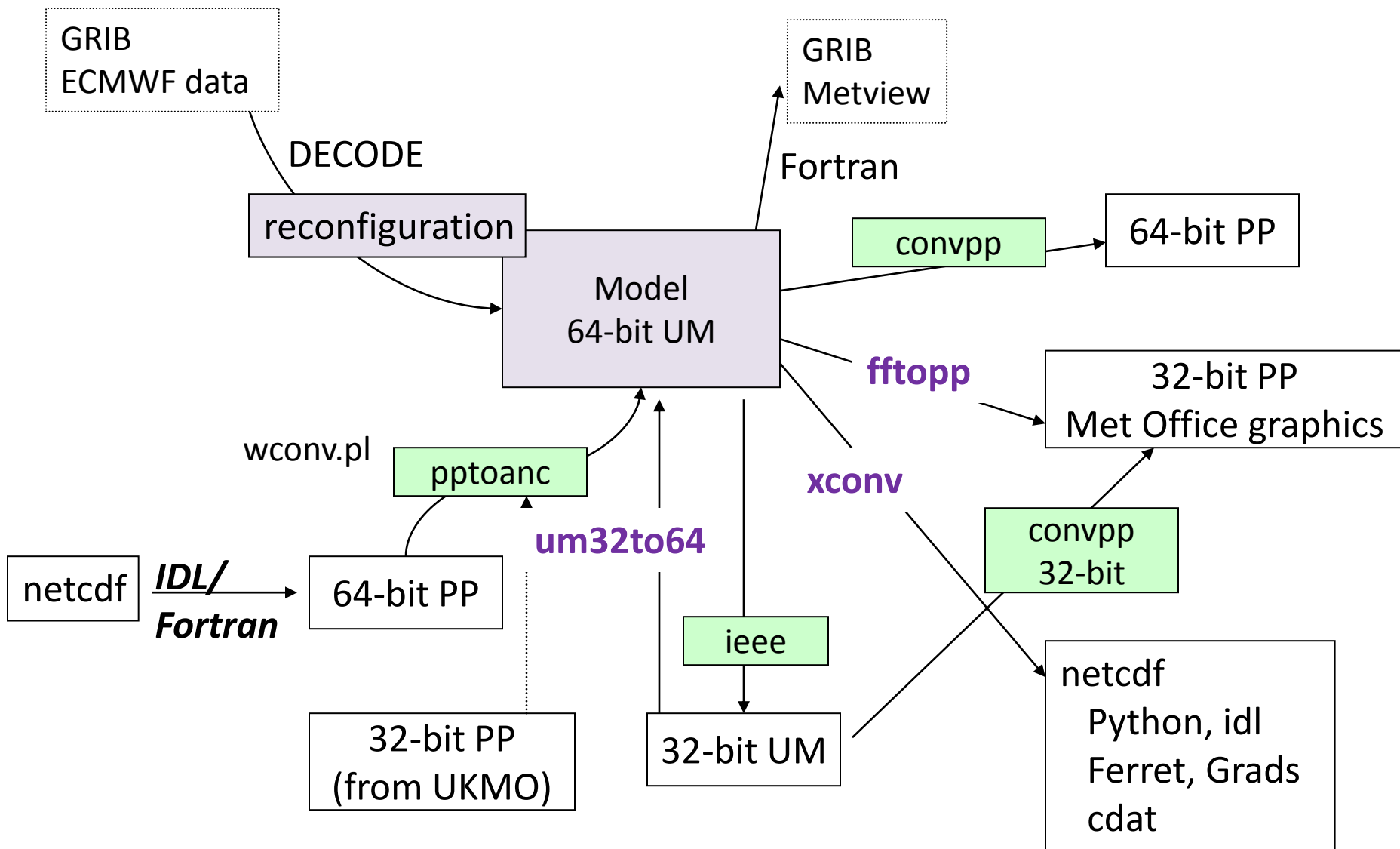
## **Part 4: UM tools and facilities**

University of Reading, 18-20 March 2015

UM Tools should provide a full range of input and output format possibilities



# Conversion tools



## Data conversion

<u>Tool</u>	<u>Input</u>	<u>Output</u>
pptoanc	PP	UM (ancillary)
xancil	netCDF	UM (ancillary)
convpp	UM	PP
ff2pp	UM (fields format)	32-bit PP
ieee	UM	32-bit UM
bigend	UM	byte-swapped UM
xconv	UM and PP	netcdf
cf-python	PP	CF-netcdf

All tools and output 64-bit unless otherwise stated

## Data information

<u>Tool</u>	<u>Purpose</u>
cumf	Compares UM format files
pumf	Prints out header information for PP files
uminfo	Header information UM
ppinfo	Header information PP

## Data manipulation

<u>Tool</u>	<u>Purpose</u>
umpack	Removes spare headers and extra buffers from UM files
fieldop	Adds, subtracts, multiplies, divides UM (fields files) format

- **Xconv** can be used to see what fields are contained within a data file and to look at the data values, either directly at the numerical values or at a gridbox fill plot of the data.
- It can also convert model output into netCDF.  
Supported input formats:
  - Data output from the UKMO Unified Model
  - UKMO PP format
  - GRIB format
  - netcdf format
- Data manipulations available:
  - Spectral to gridpoint
  - Interpolation (bilinear or area-weighted)
  - Conversion to and from rotated grids

Output file name:

Open

Setup

	nx	ny	nz	nt	Field title
0	: 192	145	85	1	U COMPNT OF WIND A
1	: 192	144	85	1	V COMPNT OF WIND A
2	: 192	145	85	1	THETA AFTER TIMEST
3	: 192	145	1	1	OROGRAPHIC GRADIEN
4	: 192	145	1	1	OROGRAPHIC GRADIEN
5	: 192	145	4	1	SOIL MOISTURE CONT
6	: 192	145	85	1	SPECIFIC HUMIDITY
7	: 192	145	85	1	QCF AFTER TIMESTEP
8	: 192	145	1	1	CONV CLOUD BASE LE
9	: 192	145	1	1	CONV CLOUD TOP LEV
10	: 192	145	1	1	CONV CLOUD LIQUID
11	: 192	145	1	1	SILHOUETTE OROGRAF
12	: 192	145	1	1	HALF OF (PEAK TO
13	: 192	145	4	1	DEEP SOIL TEMP AFT
14	: 192	145	1	1	CCRad : Lowest cor
15	: 192	145	1	1	CANOPY WATER AFTEP
16	: 192	145	1	1	SNOW AMOUNT OVER L
17	: 192	145	1	1	SURFACE TEMPERATUR

Convert

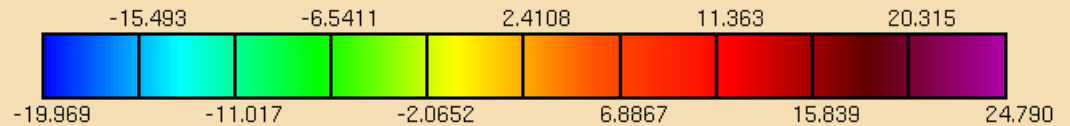
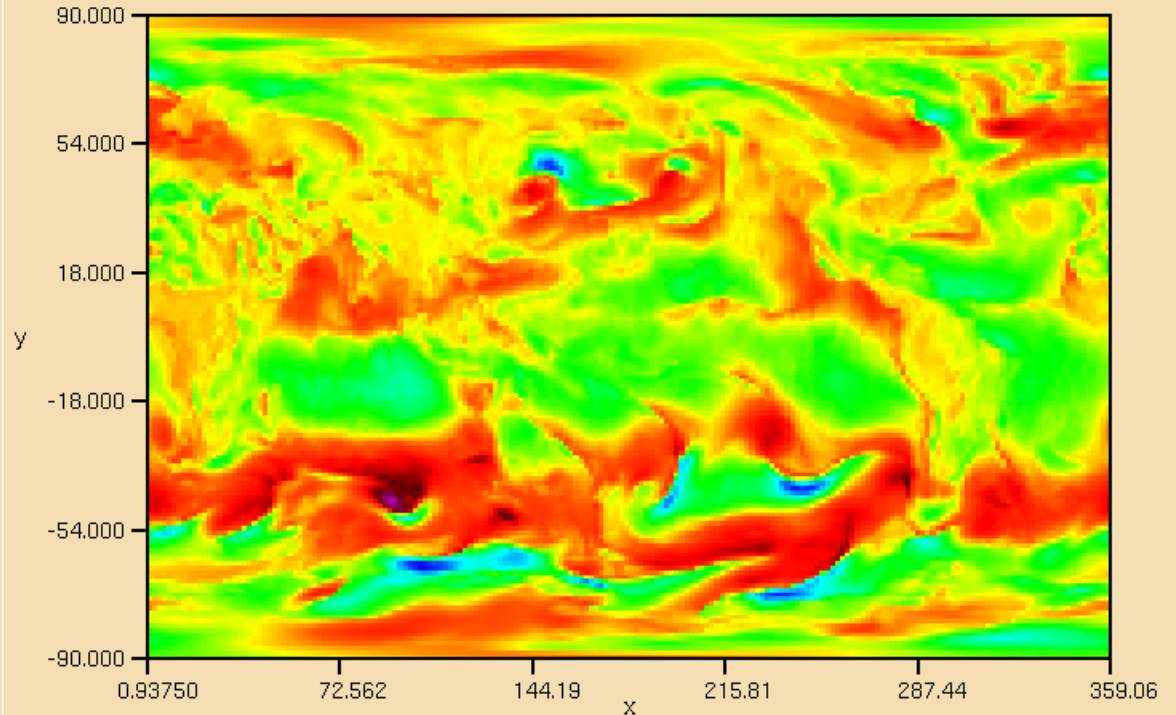
Delete

Output messages

```
file /fs2/n02/n02/grenvill/um/xk1ka/xk1kaa.da19810
ieee um file
```

Data Plot

Unified Model Output (Vn 8.2): U COMPNT OF WIND AFTER TIMESTEP (m s-1)  
 x: longitude (degrees\_east)  
 y: latitude (degrees\_north)  
 z: hybrid\_ht 10.00000035 (level)  
 t: date / t 1981/09/02:00.00 / 1.000000 (days since 1981-09-01 00:00:00)



Dismiss

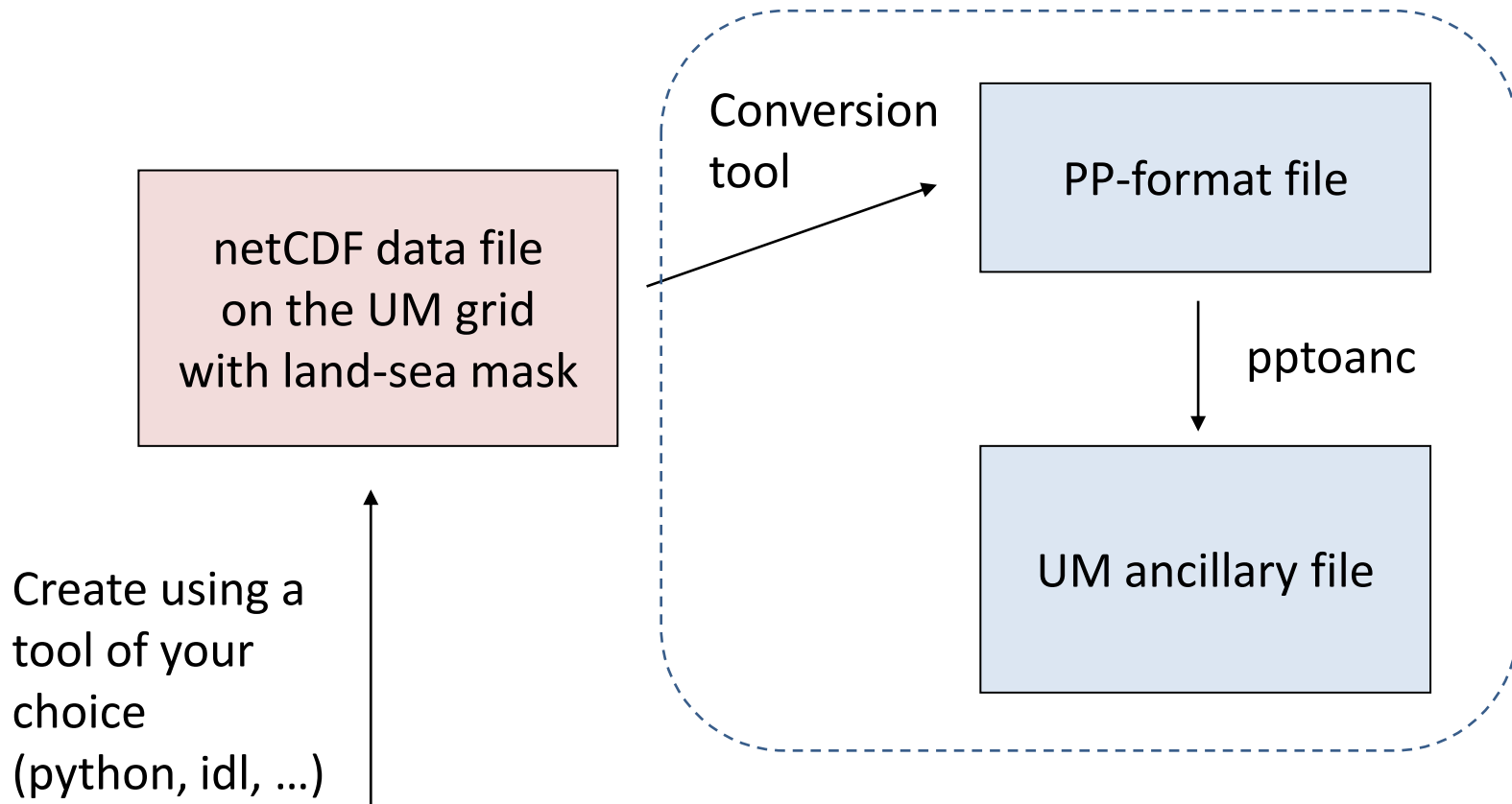
Save

- For creating standard ancillary files can use the **Central Ancillary Program (CAP)**
  - Orography
  - Land-sea mask
  - Soil moisture, snow
  - Vegetation
  - Aerosol
  - Sea surface temperature, sea-ice
  - Ozone
- Typically used for running the LAM
- Contact the CMS helpdesk for more information:  
<http://cms.ncas.ac.uk/wiki/CmsHelpdesk>



# Making ancillary files (ii)

For creation of ancillary files from your own data.



This can also be done with xancil

**Xancil**

- Configuration
  - General configuration
  - Grid configuration
  - Select Ancillary files to be created
- Atmosphere
  - Ozone
  - Soil Moisture and Snow Depth
  - Deep Soil Temperatures
  - Soil Parameters
  - Vegetation Parameters
  - Vegetation Fractions
  - Vegetation Functional Types
  - Disturbed Vegetation Fraction
  - Sea Surface Temperatures
  - Sea Ice
  - Orography
  - Land/Sea Mask
  - Land Fraction
- Ocean
  - Reference SST, SSS, Air-Temp & Ice-Depth
  - Flux Correction Fields

### Sea Surface Temperatures

Create Sea surface temperature ancillary file? ◆ yes ▾ no

Enter input SST NetCDF file name:

Browse

NetCDF SST variable name:

Enter output SST ancillary file name:

Browse

Enter minimum allowed SST value:

Enter SST value over Sea-Ice:

Is SST ancillary data periodic in time? ◆ yes ▾ no

Don't calculate land mask

Use missing data value to calculate land mask

Use land-sea mask NetCDF file to calculate land mask

Use land fraction NetCDF file to calculate land mask

Use dates from NetCDF file

Specify SST ancillary file dates

Use dates from Grid Configuration panel

Overwrite NetCDF dates with specified dates

Extract only specified dates from NetCDF file

Enter Start date of SST data:

Year  Month  Day

Output messages

```
Running mkancil executable /home/jeff/um/xancil/mkancil0.40
Output from /home/jeff/um/xancil/mkancil0.40 executable:

Writing Sea Surface Temperature ancillary file /home/jeff/um/xancil/sst
Writing Sea Ice ancillary file /home/jeff/um/xancil/ice
End of mkancil
```

Load Job

Save Job

Save Job As

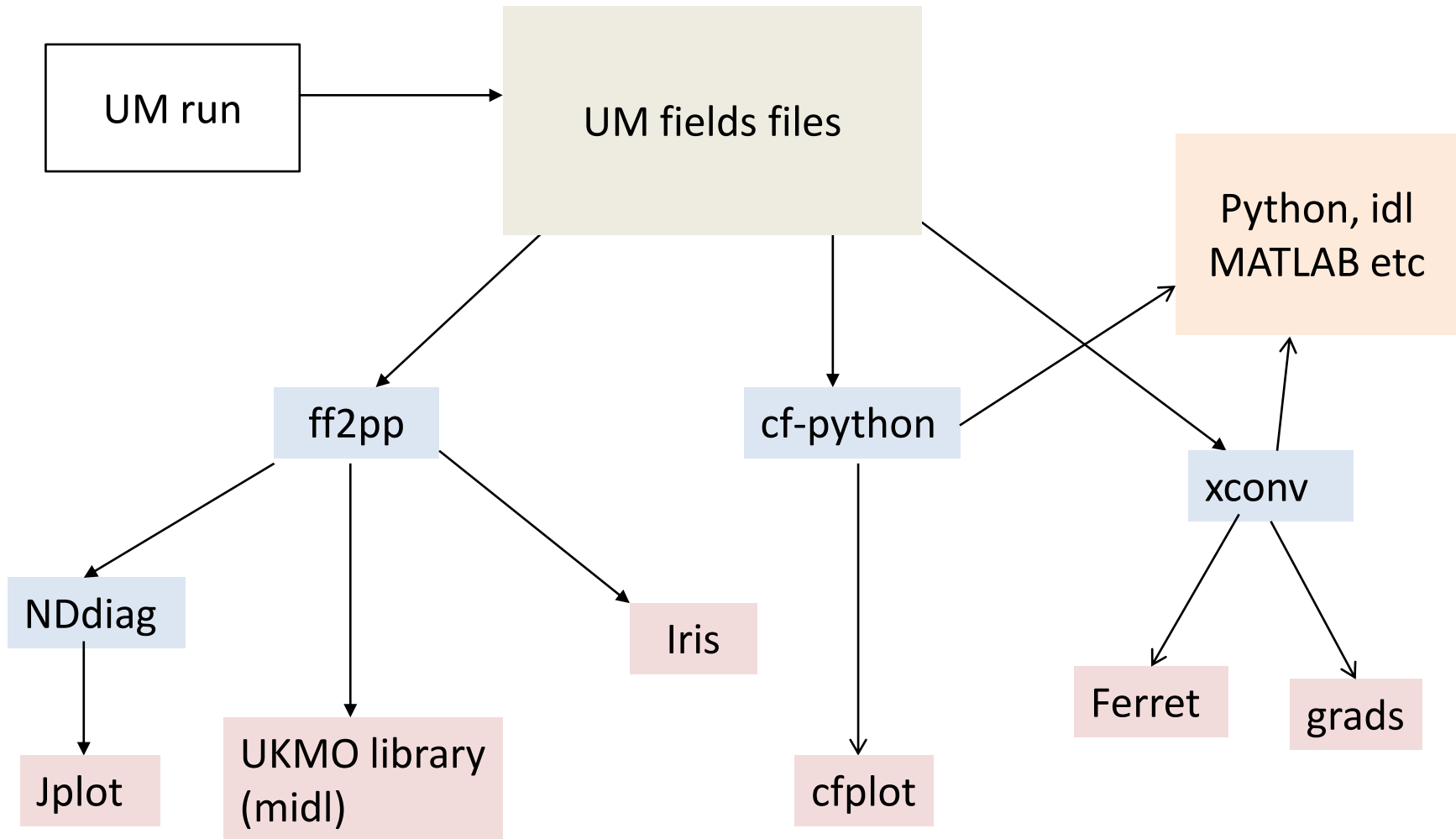
Save Namelist

Save Namelist As

Create Anc. files

Quit

# Visualisation and analysis





- Collection of tools commonly used for atmospheric and Earth observation science, including:
    - NetCDF and nco tools
    - Cf-python, cfplot and Iris
    - Xconv, CDAT and lots more
  - Installed on all the Jasmin systems (at BADC, Bristol, Reading and Leeds).
  - Can download as:
    - Virtual Machine, which will work on any system running VirtualBox
    - RPMs for RHEL/CentOS Linux
- <http://proj.badc.rl.ac.uk/cedaservices/wiki/JASMIN/AnalysisPlatform>