**Processing of U and V-WIND maps from the Arpege model**

**Introduction.**

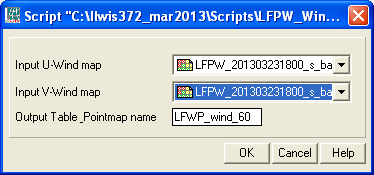
As output from various numerical weather prediction models, like those from ECMWF (in the Meteorological Data Dissemination Service) and from the Arpege model (Meteo France) a U and V wind map, at different pressure levels, is provided. The U-component represents the east-west component of the wind, while the V-component represents the north-south wind component.

The script transforms the various U and V-wind components from the Arpege model into wind direction and wind speed. Here 0.5 degree maps are assumed.

**Running the script.**

Download the ZIP file and copy the “LFPW\_winds.Zip” file into the ILWIS subdirectory \Scripts and then Unzip the file. Copy the files LFPW.csy and LFPW.grf into the ILWIS sub-directory \System. Start ILWIS and from the main menu, select the option “*Operations*” >> “*Script*” and select the script “*LFPW\_winds*”. From the pop-up script input window specify the input U and V wind maps and the output name for the point map and table, see figure 1.

**Figure 1: input layers needed to calculate wind direction – speed point map and table**



**Script listing.**

// Calculation of wind vectors (direction and speed)

// Input is processed layers from Arpege NWP model Meteo France

// The U and V Wind maps are required

//Calculation wind direction and speed

direction\_rad:=atan2(%2,%1)

direction\_degree:=raddeg(direction\_rad)

wind\_speed:=sqrt((POW(%1,2))+(POW(%2,2)))

wind\_speed.mpp:=PointMapFromRas(wind\_speed)

direction\_degree.mpp:=PointMapFromRas(direction\_degree)

copy '%ILWIS\_LOCATION%\script\'mpp2table.exe \*

!mpp2table.exe wind\_speed.mpp wind\_speed.tbt

!mpp2table.exe direction\_degree.mpp direction\_degree.tbt

copy '%ILWIS\_LOCATION%\script\'LFPW\_wind.dom \*

windspeed.tbt:=TableChangeDomain(wind\_speed.tbt,LFPW\_wind.dom)

%3.tbt:=TableChangeDomain(direction\_degree.tbt,LFPW\_wind.dom)

tabcalc %3.tbt WindDirection:=name;

tabcalc %3.tbt WindSpeed:=ColumnJoin(windspeed.tbt,name);

calc %3.tbt;

tabcalc %3.tbt Scale\_Speed:=WindSpeed\*0.5;

delcol %3.tbt.name;

%3.mpp:=PointMapFromTable(%3,Coordinate)

del mpp2table.exe -force

del direction\_rad.mpr -force

del direction\_degree.mpr -force

del wind\_speed.mpp -force

del wind\_speed.mpr -force

del direction\_degree.mpp -force

del direction\_degree.tbt -force

del windspeed.tbt -force

del windspeed.tbt -force

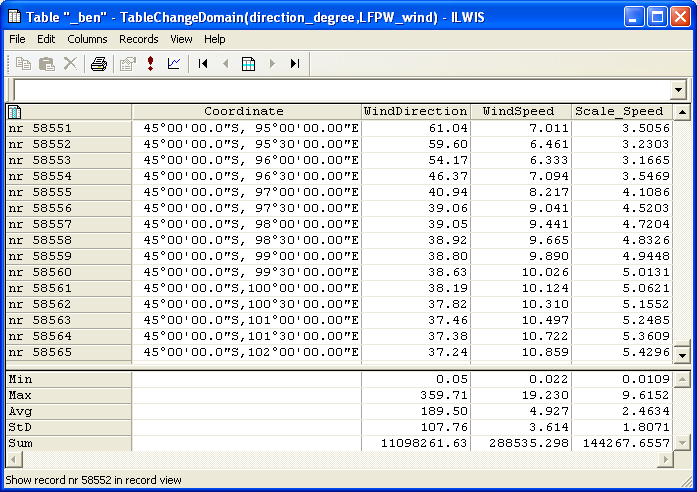
del wind\_speed.tbt –force

Note: the files “LFPW\_winds.dom” and “mpp2tables.exe” should be available in the ILWIS sub-directory \scripts! Furthermore note that here an “ID” domain has been created for the LFPW maps, assuming a map dimension of 221 lines by 265 columns (58565 ID’s). In case there is another map dimension, create a new “ID” domain with the required number of entries!

**Output.**

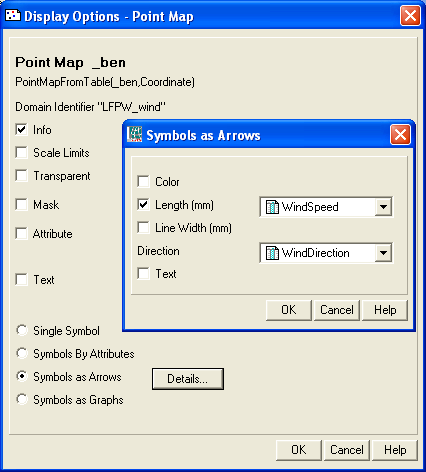
When calculation has completed, two files have been created, a table and point map. Display the table, your result should resemble the one in figure 2. A column “Scale\_speed” has been computed which can be used for visualization, in case of high wind speed.

**Figure 2: final output table**



To display the point map, double click the point map created and enter the settings as specified in figure 3, note that with the ID-domain used you can visualize the points using an arrow symbol and these can be scaled (for this purpose the column ‘WindSpeed’ or ‘Scale\_Speed’ is used). The resulting map is given in figure 4 showing winds at 10 mtr – 60 hr forecast, using a vector file with the country boundaries for geographical reference.

**Figure 3: Point map options using table attributes**



**Figure 4: Resulting point map visualization**

