GeoQSymbols

a collection of SVG structural geology map symbols for QGIS

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The symbols are based on the set of symbols in GeoMapSymbol, a MapInfo symbol library I originally developed for MapInfo

Symbols for showing the strike and dip of planes are duplicated into separate folders for dip direction entry, or for Right-hand-rule strike entry. Arrow symbols for line plunges are in a separate folder. Fill and stroke styles are editable for all symbols (where appropriate).

To use in QGIS:
Place the folder tree, or any of the folders, or any of the individual symbol files, within one of the SVG directory paths set up in QGIS.(That is, in one of the directories to be found under Settings…Options…System). [Note: I set up a path to a folder outside QGIS for such files so that they are not affected by updates].

Positioning dip labels
Dip labels need a positional formula to display correctly near the end of the dip or plunge of the symbol. This formula can be entered manually or by use of the custom expression shown in the pyQGIS code on the next page (and distributed as *placeDipLabel.py*).

Procedure:

1. Select the structure symbol layer, and go to the Properties...labels...Placement tab.
2. Select "Offset from point" in the top radio buttons.
3. Select the appropriate scale units. (I tend to use 'Meters at Scale' for my symbols).
4. Select the small **ε** calculation button to the right of the Offset X, Y boxes
5. Enter the following formula, or use the custom function *placeDipLabel.py*

   to_string(((-***distance***)*cos(radians("*DipDirn*" -90))))||','|| to_string((((-***distance***)*sin(radians("*DipDirn*" -90)))))

   where "DipDirn" is the dip direction attribute field
   and ***distance*** is your estimate of the required offset of the label. [This needs trial and error to establish].

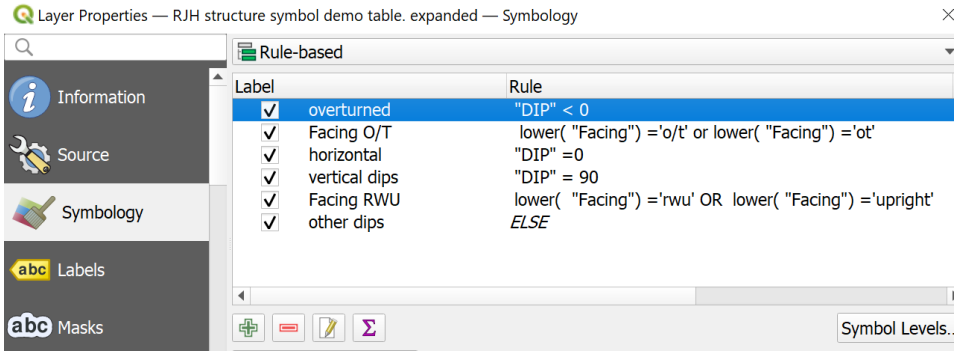
For plane symbols using RH-rule strike the formula can be adjusted by substituting ["*Strike*"] for ["*DipDirn*" +90]

This formula places upright labels at the end of the symbol tick marks or arrow heads (which is the most common convention in maps). But if you would like the labels rotated with the symbol then you need also to enter the formula ["*dipdirn*" - 90] into the Rotation **ε** calculation in the Data defined group in this Placement tab. Or ["*strike*"-180] for RH-rule strike entries.

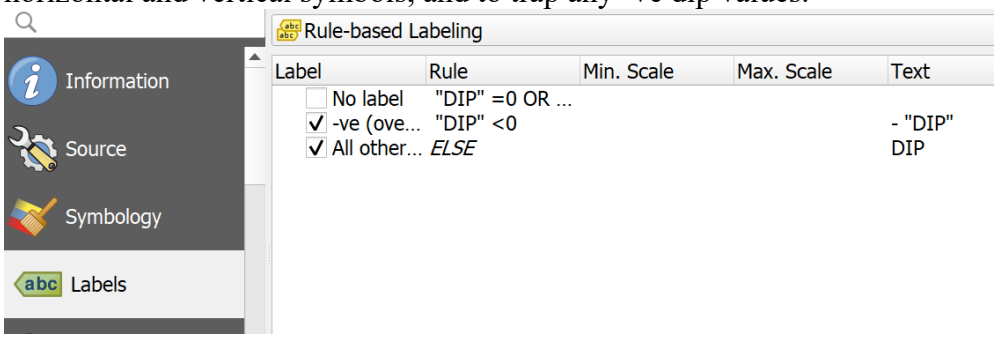
The following is an Attribute table containing structural bedding data

	DIPDIR	DIP	RHStrike	Facing	Structure	FabType	Comment
1	45	36	315	RWU	S0	P	*NULL*
2	330	65	240	RWU	S0	P	*NULL*
3	140	20	50	*NULL*	S0	P	*NULL*
4	220	75	130	*NULL*	S0	P	*NULL*
5	60	90	330	*NULL*	S0	P	vertical
6	120	70	30	O/T	S0	P	overturned in Facing
7	50	0	320	*NULL*	S0	P	horizontal
8	200	-80	110	*NULL*	S0	P	overturned, by -ve

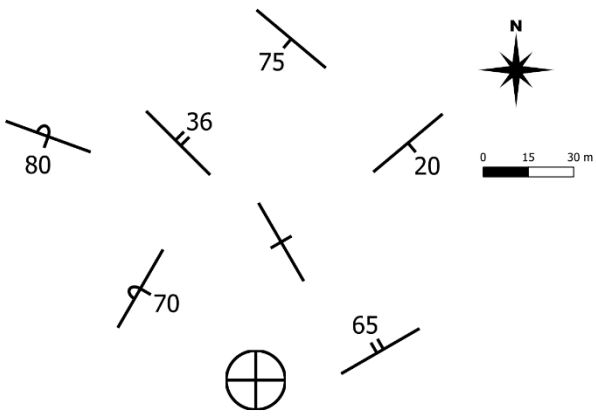
The data have been plotted using rule-based symbology to use different types of bedding symbols for different dip and facing values. The rules have been set up to accept overturned dips either as -ve dip values or as a notation in a dedicated *Facing* field:



Similarly, the labels have been entered as rule-based labels designed to omit labels for horizontal and vertical symbols, and to trap any -ve dip values.



Results:



Python code for placeDipLabel.py custom function:

```
from qgis.core import *
from qgis.gui import *
from math import *

@qgsfunction(args='auto', group='Custom')
def placeDipLabel(dist, dirn, IsStrike, feature, parent):
    """
    Calculates the Offset X,Y location of dip labels for structural map symbols
    """
    if IsStrike == True:
        dipdirn = dirn + 90
        if dipdirn > 360:
            dipdirn = dipdirn + 90
    else:
        dipdirn = dirn

    X = dist * cos(radians(dipdirn-90))
    Y = dist * sin(radians(dipdirn-90))
    XYstring = str(X) + ',' + str(Y)

  return XYstring
```

If you have obtained the python file for this Custom Function (**placeDipLabel.py)** it can be made available for the QGIS expression builder by placing it within the python module of in the User's profile folder:
user\AppData\Roaming\QCIS\QGIS3\profiles\default\python

It then becomes available under the Custom tab in the expression builder.