MyDiag diagnostic

This page gives an overview of the MyDiag diagnostic set implemented in the ESMValTool. It is intended as a template for adding new diagnostics to the tool.
The following points are covered,

- Files to modify
- How to get a certain version (revision) of the code and create a predefined test plot

Files to modify

All paths in the following are relative to the root folder of the ESMValTool.

- **`nml/namelist_MyDiag.xml`**:

  Global flags, diagnostics to do, and models that shall be evaluated by those diagnostics are specified here. Each `<diagnostic>` entry must refer to a script in the folder **`diag_scripts/`**, complemented by a variable and the corresponding (input) field type. Data that shall be evaluated by specific diagnostics only may be added with `<model>` specifiers to the respective diagnostics. See here for a more comprehensive list of namelist XML tags.

- **`nml/cfg_MyDiag/cfg_MyDiag.ncl`**:

  This file contains specific control parameters in NCL syntax for the diagnostic script **`diag_script/MyDiag.ncl`**. They are specified as attributes of the variable `diag_script_info`. All **`cfg_*`** files for a diagnostic set need to be in the same folder, as specified by the `<diag_script_cfg_dir>` entry of **`nml/namelist_MyDiag.xml`**

- **`var_att/MyVar.att`**:

  Variable specific parameters are defined here in NCL syntax, as attributes of the variable `var_att_info`. Derived variables require a `calculate function`. Here temperature at 200 hPa is extracted from the CMIP5 `ta` variable and defined as `MyVar`.

- **`diag_script/MyDiag.ncl`**:

  This is the actual diagnostic routine, as specified by a `<diag_script>` entry in **`nml/namelist_MyDiag.xml`**. It makes use of the `function contour_map` in **`plot_scripts/contour_map.ncl`** for plotting, and other general functions (e.g. for fetching data, writing NetCDF output, time averaging). Please look into the code ...

- **`doc/MASTER_authors-refs-acknow.txt`**:

  This is the central lookup table for references & acknowledgements that might be selected within the plot_type routines.

The following files allow project specific control, but in general do not need to be modified when implementing a new diagnostic.

- **`interface_scripts/projects.py`**:

  This routine controls the interpretation of the elements in each `<model>` entry of **`nml/namelist_MyDiag.xml`**. This is controlled by the first ("project") element in each `<model>` entry.

- **`diag_scripts/lib/ncl/style.ncl`**:

  This routine defines project specific settings for annotation, line colors, dash patterns etc. It is chosen via the `diag_script_info@styleset` entry in **`nml/cfg_MyDiag/cfg_MyDiag.ncl`**

MyDiag test suite

The software requirements for running the test suite are listed on the Getting started page.

The test case is located in revision 1140 of the trunk of the repository. To check out and run it, follow the instructions below. Note that commands to be issued are written `highlighted` while general instructions are written as normal text.

1. `svn checkout --username <USERNAME> -r 1140 https://svn.dlr.de/ESM-Diagnostic/source/trunk@1140 ESMValTool_r1140`
2. `cd ESMValTool_r1140`

OR alternatively, if starting from a tar-file (revision number might be different from r1140):
1. `tar xvf ESMValTool_r1140.tar`
2. `cd ESMValTool_r1140`

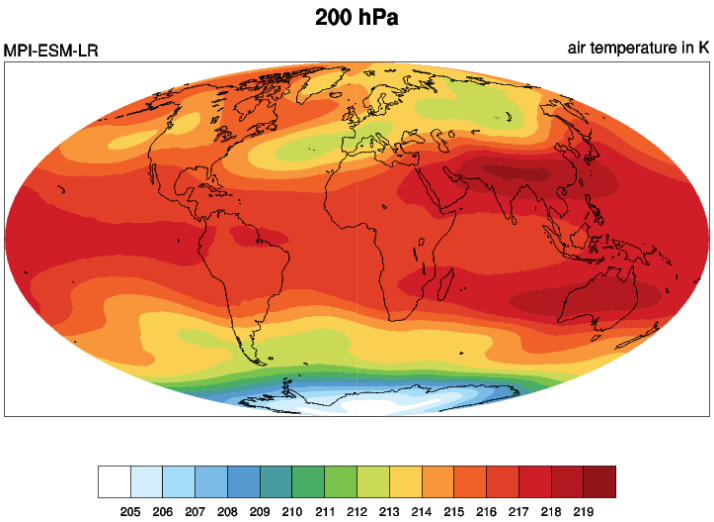
3. In the **`nml/namelist_MyDiag.xml`**-file, update the following tags with proper paths,

   `<wrk_dir>` - path to dir working dir
   `<plot_dir>` - path to where output figures are placed
   `<climo_dir>` - path to where intermediate NetCDF files are written

4. In the **`nml/namelist_MyDiag.xml`**-file, update the models listed in the `<MODELS>` section with CMIP5 data sets available on your file system.
The syntax for each line is,

```
<project> <model> <MIP_table> <experiment> <ensemble_member> <start_year> <end_year> <path to file>
```

5. Run MyDiag diagnostic with `main.py nml/namelist_MyDiag.xml`
The following figure should have been produced in the `MyDiag` subfolder of your <plot_dir>:



Now browse the files listed in the first section and modify them according to your needs.
In general it is a good idea to consult also other diagnostic sets that might serve as a better template for your diagnostic.

Please report anything that needs to be changed to klaus-dirk.gottschaldt at dlr.de
For further documentation on usage of the tool, see the ESMValTool Wiki.