

## Using MAGICC to Explore Climate Change Scenarios Model for the Assessment of Greenhouse-gas Induced Climate Change

### Introduction

MAGICC consists of a suite of coupled gas-cycle, climate and ice-melt models integrated into a single software package. The software allows the user to determine changes in greenhouse-gas concentrations, global-mean surface air temperature, and sea level resulting from anthropogenic emissions

SCENGEN constructs a range of geographically explicit climate change projections for the globe using the results from MAGICC together with AOGCM climate change information from the CMIP3/AR4 archive.

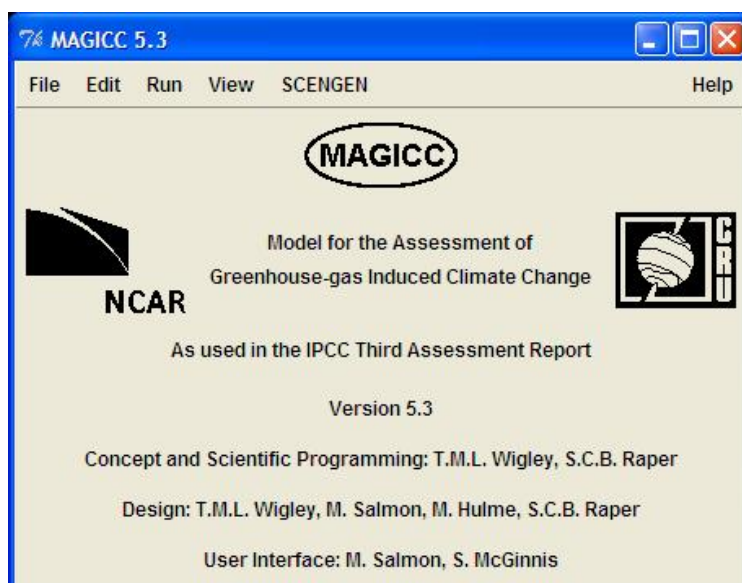
(UCAR, 2009)

You can view the main homepage and download your own copy of MAGICC/SCENGEN from:  
<http://www.cgd.ucar.edu/cas/wigley/magicc/>

### Starting MAGICC

When you double-click the icon for MAGICC, it will load up and present you with the welcome screen:

**Note:** if running MAGICC from a downloaded copy, run the program file "magicc.exe" in the '\scen-53\magicc' folder



The main menu items are **FILE**, **EDIT**, **RUN** and **VIEW**. If you wish to access a separate application called **SCENGEN** then you can start it from the 5<sup>th</sup> menu item. There is also a **HELP** (documentation) menu option.

## Example Investigation

Select EDIT → Emissions Scenarios

TWO emissions scenarios need to be selected for MAGICC to run: The **REFERENCE** scenario and the **POLICY** scenario. MAGICC comes with a library of pre-defined emissions scenarios.

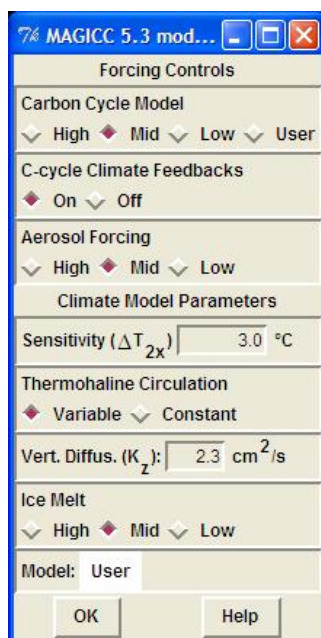
You can read about the various scenarios and policies here:

[http://www.grida.no/publications/other/ipcc\\_sr/?src=/climate/ipcc/emission/](http://www.grida.no/publications/other/ipcc_sr/?src=/climate/ipcc/emission/) and:  
<http://sedac.ciesin.columbia.edu/ddc/sres/>

Generally, you should stick to the **SRES** scenarios that are well documented and recognised by the IPCC (these are shown in MAGICC as hyphenated options)

From the list of scenarios use the default of **B2-MES** (policy) and **A1B-AIM** (reference) and click on **OK** to initialise the scenarios.

Next, click on EDIT → Model Parameters and you will see an options panel:

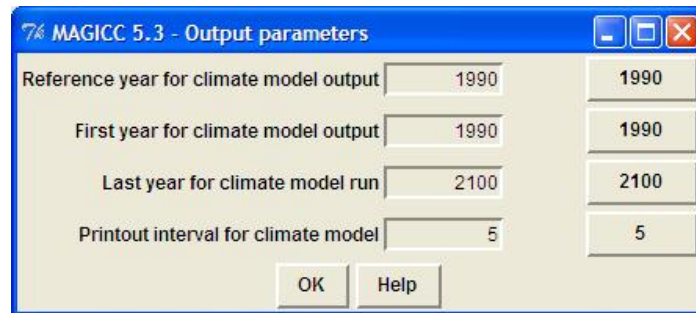


Most of these options should be self-explanatory. You can select the level of complexity of the carbon cycle, whether carbon cycle feedback occurs, degree of aerosol forcing, model sensitivity, accuracy of thermohaline circulation, degree of vertical atmospheric diffusion and rate of ice melt.

For now, just leave the defaults and click on **OK**

Finally, you can change the date range for the model run:

Select EDIT → Output years

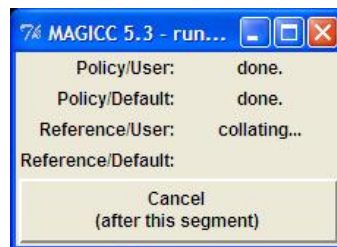


Leave the default values for now and click on **OK**

Now you can run the model based on the user settings:

Select RUN → Run Model

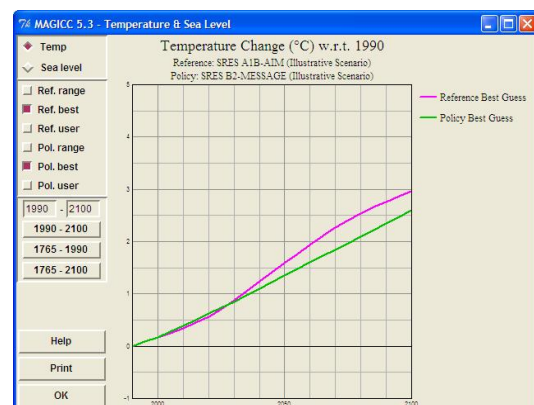
You will see a progress window:



Don't be alarmed if it takes a while to complete the model analysis. Once this stage has completed you can view the results:

Select View → Either items from **GRAPHS** or **REPORTS** - for example, look at **Temperature & Sea Level** from the **Graphs** section:

*Now try experimenting by looking at the numerous results options and changing the initial user settings*



## Reading List

UCAR (2009) MAGICC/SCENGEN Homepage, [Online], Available: <http://www.cgd.ucar.edu/cas/wigley/magicc/> (2<sup>nd</sup> November 2009)