

Using the CSIRO Mk3L climate system model

Part 4: Consolidation and next steps

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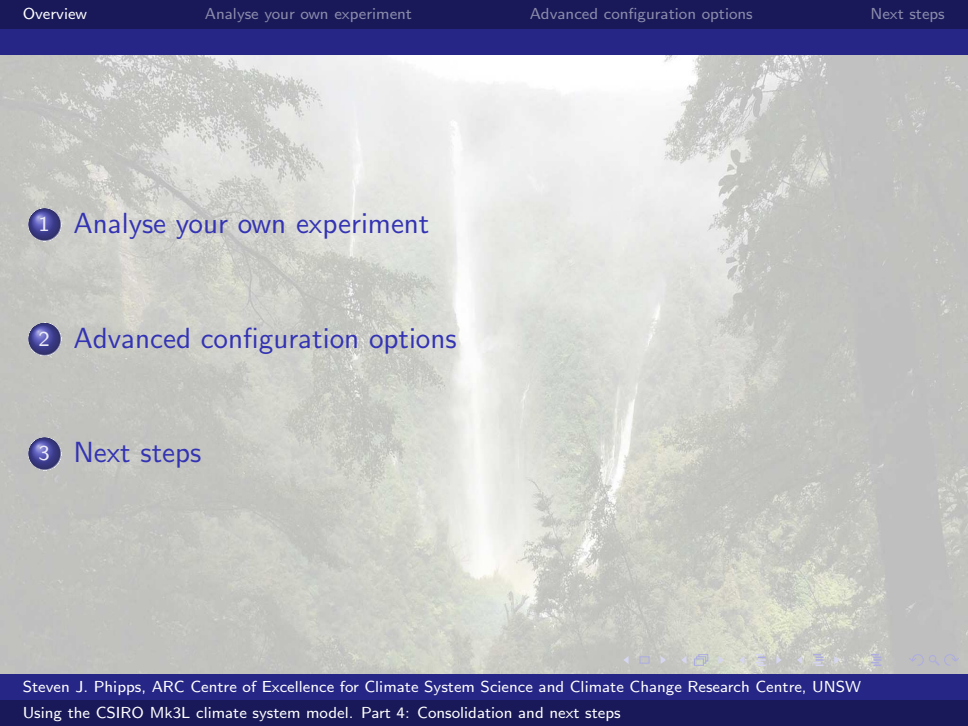
ARC Centre of Excellence for Climate System Science

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CLIM3001

28 May 2015

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1. Analyse your own experiment

Reminder: Using Katana

- Launch Xming (Programs > Xming > Xming).
- Launch PuTTY (Programs > PuTTY > PuTTY).
- Using PuTTY, do the following:
 - Select Connection > SSH > X11
 - Check the Enable X11 forwarding box
 - Select Session
 - In the Host Name box, enter `katana.science.unsw.edu.au`
 - Click Open
 - Log in using your zNumber and zPass

Analyse your own experiment

- Last week, you created and ran your own experiment.
- The output was saved in a directory called:

```
/srv/scratch/$USER/$run
```

- \$USER is your zID and \$run is the name of your experiment.
- Did it work? If not, why not?
- Use Ferret to analyse and plot the data.
- Generate some GIF images and copy the files back to your local machine.
- If it worked, maybe you could run some additional experiments?
- If it didn't work, fix it and try again.

2. Advanced configuration options

Summary: Basic configuration options

- What we've covered so far:
 - how to configure the model via the control file
 - how to change the atmospheric CO₂ concentration by generating a new auxiliary file
 - how to apply freshwater hosing
- This enables you to vary:
 - the epoch
 - the solar constant
 - the atmospheric CO₂ concentration
 - the freshwater flux into the ocean

Advanced configuration options

- There are three other ways of configuring aspects of the model:
 - modify other auxiliary files
 - modify the restart files
 - modify the source code

Auxiliary files

- Bottom boundary conditions:
 - topography (`psrk.nc`, `landrun21`)
 - bathymetry (`orest.nc`)
 - albedo (`albedo.nc`)
 - vegetation and soil types (`sib*.nc`)
- Radiative boundary conditions:
 - CO₂ transmission coefficients (`co2_datafile`)
 - ozone mixing ratios (`amip2o3.dat`)
- Freshwater hosing (`hosemask`)
- Flux adjustments (`dtm.nc`, `*cor.nc`)

Examples of advanced configuration

- Applying surface anomalies (e.g. SST, SSS, heat flux, wind stress):
 - modify the flux adjustments
- Configuring the model for a different era:
 - modify the topography and bathymetry
 - modify the albedo, and the vegetation and soil types
 - modify the epoch, solar constant, CO₂ transmission coefficients, ozone mixing ratios
 - issues with restart files, spin-up procedures and flux adjustments

3. Next steps

Next steps

- Get a copy of Mk3L. Apply for an account on the subversion server:

<http://www.tpac.org.au/resources/csiro-mk3l-source-code/>

- Run Mk3L on katana, on your PC, on your laptop, on your smartphone...
- Experiment with the model and get to know it.
- Subscribe to the mailing list:

<https://www.lists.unsw.edu.au/mailman/listinfo/mk3l-users>

Next steps

- Ask questions:

Mk3L users mailing list	<code>mk3l-users@lists.unsw.edu.au</code>
Me (model developer)	<code>s.phipps@unsw.edu.au</code>

- Share your experiences with other users.
- Share your enhancements to the model.
- Remember what a privilege it is to be a climate system modeller.
- Have fun!

With great power, comes great responsibility

