# Climate change in APSIM



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## Linking projections with simulations

Projections: large scale, long timestep Apsim: point scale, daily timestep





<image>

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Downscaling

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### Linking projections with simulations

2 distinct methods: perturbation vs resampling

Perturbation (modification of a historical record)

- pros: simple if records exist

- cons: misleading if a) records are inadequate, b) change is not fully described.



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## Linking projections with simulations

2 distinct methods: perturbation vs resampling

Resampling (characterisation of daily climate, sampled from this distribution)

- pros: can a) effectively deal with tails (extremes), b) produce infinite length projections

- cons: adequate characterisation can be difficult, linkages between climate variables can be statistically correct but physically impossible.

Weatherman (ex DSSAT) <u>http://www.icasa.net/dssat/index.html</u> WGEN (LARS-WG) <u>http://www.rothamsted.bbsrc.ac.uk/mas-models/larswg.php</u>

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## Sources of change projections

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http://www.csiro.au/ozclim

- uniform scales over Australia

### http://www.ipcc-data.org/

- disparate models, scales, times
- difficult to extract "what you want".

#### http://www.csag.uct.ac.za/

- Currently under development

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## Change projections in apsim

2 components:

- CO<sub>2</sub> effects on crop growth:
- TE, Nconc modifiers as f(CO<sub>2</sub>)
- requires a modified "ini file" for each crop

- met data modification via "Climate control"
- a drop in UI component that perturbs met data



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## Change projections in apsim

Exercises