Hydropower in a changing climate
Bridging the gap between climate projections and operational decisions

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Hydro Tasmania (1924 - ): Australia’s largest renewable energy generator
? Is this the new ‘normal’?
Finding the answer: collaboration
Climate Research:

1. Study of Future and Current Climate: A Scenario for the Tasmanian Region (CSIRO and TPAC 2005)
2. Climate Futures for Tasmania (ACE CRC 2011)
The square peg and round hole problem

Global Climate Model (GCM)

Reality

Average annual rainfall (mm)
The technical solution: ‘downscaling’
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- Inflows from 6 state-of-the-art climate models to 2100
- Lake Levels
- Power Generation
Simulated

Reality

Simulated

Why Dynamical Downscaling?
Changes to Inflows by 2100

Mean Annual Inflow (GL/d)

Central Estimate

Historical
Changes in Runoff by 2100

Change in runoff 1961-1990 vs 2070-2099

Percent Change in Runoff

-90 -60 -30 -20 -15 -10 -5 5 10 15 20 30 60 90

Annual
Summer
Winter
Autumn

Changes to Power Generation
Changes to Power Generation
HT - Climate Change Operational Response

- Conservative management of storages
- Infrastructure investment: 1000 GWh Project
  - 425 GWh by 2015: $240 million
- Ongoing Research
Environment

- Lake Level Management
- Releases

Great Lake ~ 3,000 GL
Future Planning?
Summary

- Cutting edge dynamical downscaling climate research provides a technical solution to inform climate change adaptation

- Research partnerships are effective in delivering climate information useful to decision makers

- Hydro Tasmania is actively using climate research to inform its business operations