



Testing management strategies for abalone fisheries.

Malcolm Haddon, Craig Mundy, and Fay Helidoniotis

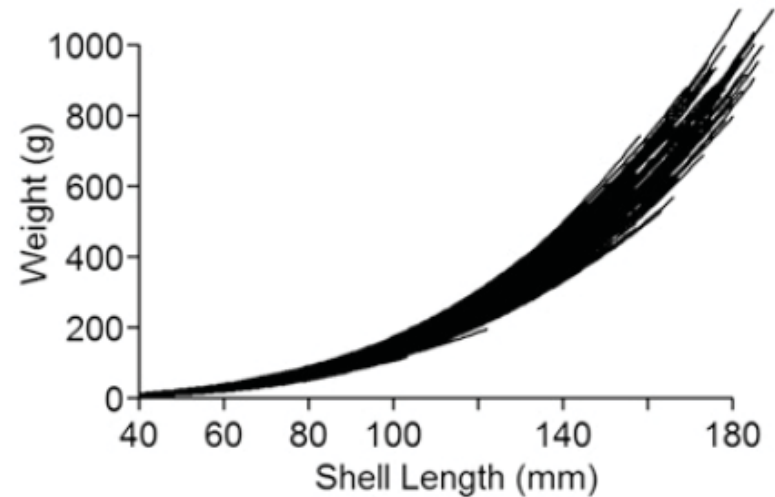
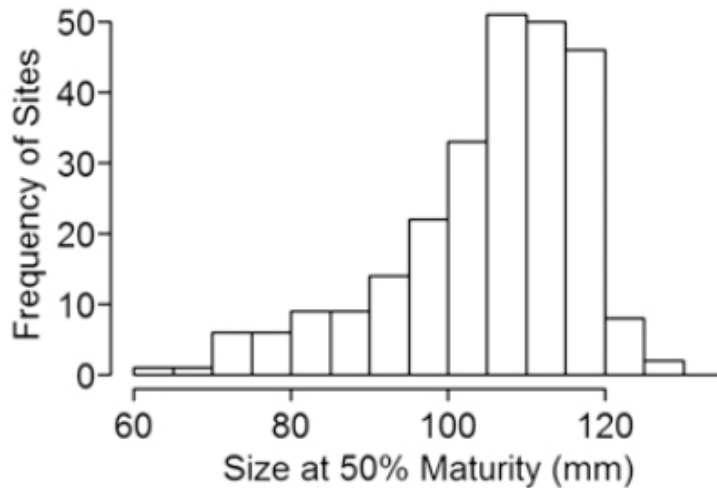
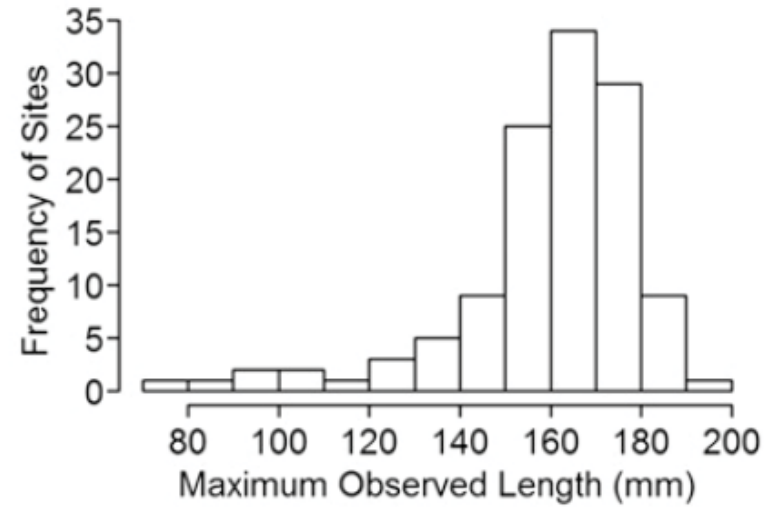
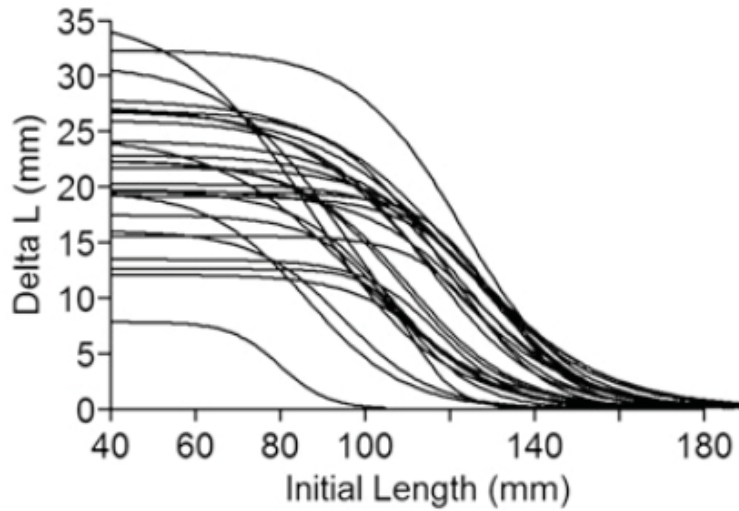
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Abalone Vary from Place to Place



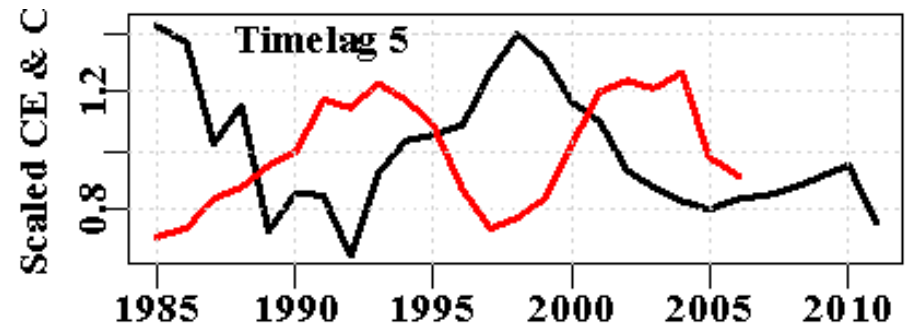
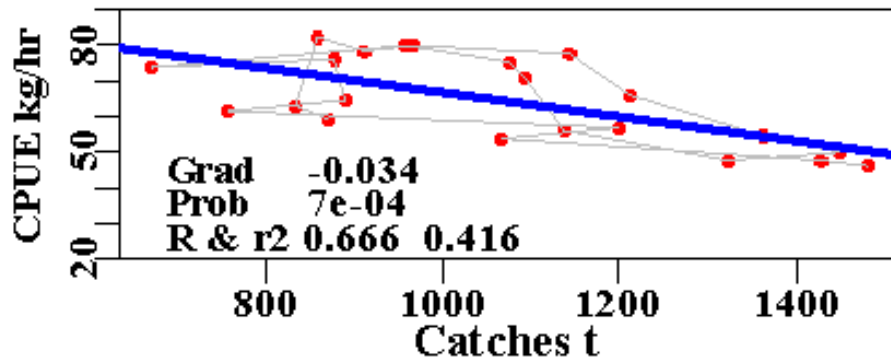
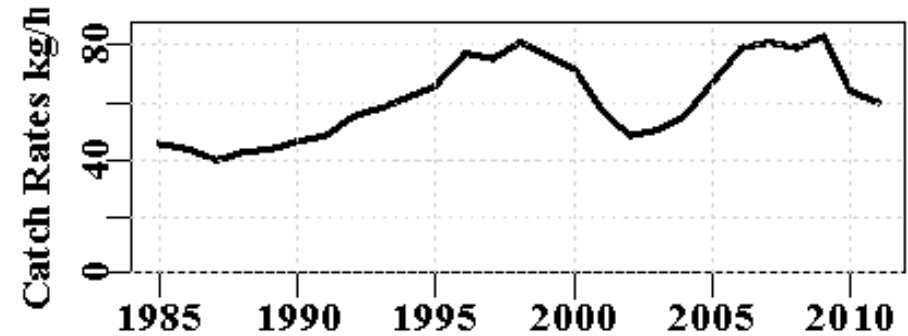
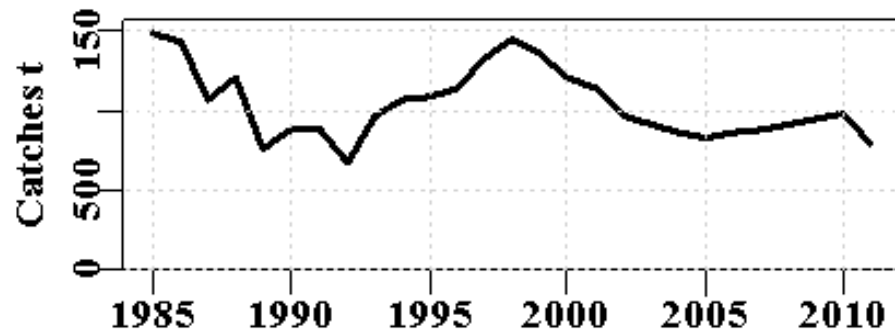
Haddon & Helidoniotis, 2013

Empirical Performance Measures

- **Stock Status:**
 - CPUE
 - Length-Frequency distributions
 - Distribution of Catches
- **Fishery Status:**
 - Catch per Diver
 - Total Catch
 - Total Effort
- **Fine-Scale PMs from GPS Data-Loggers will be added to more classical PMs.**

Catch Rates with Abalone!

- CPUE blamed for the demise of Californian Abalone
- Abalone CPUE tends to be Hyper-stable.





Need

- **Tasmanian Trust** Identification and Evaluation of Performance Indicators for Abalone Fisheries

- **They are effective** Malcolm Haddon¹, Stephen Mayfield³, Fay Helidoniotis², Rowan Chick³ and Craig Mundy²

- **Simulations with**

1. CSIRO Wealth from Oceans Flagship, GPO Box 1538, Hobart, TAS 7001, Australia.
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3. SARDI Aquatic Sciences, PO Box 120, Henley Beach, SA 5022, Australia

June 2013 Project No 2007/020



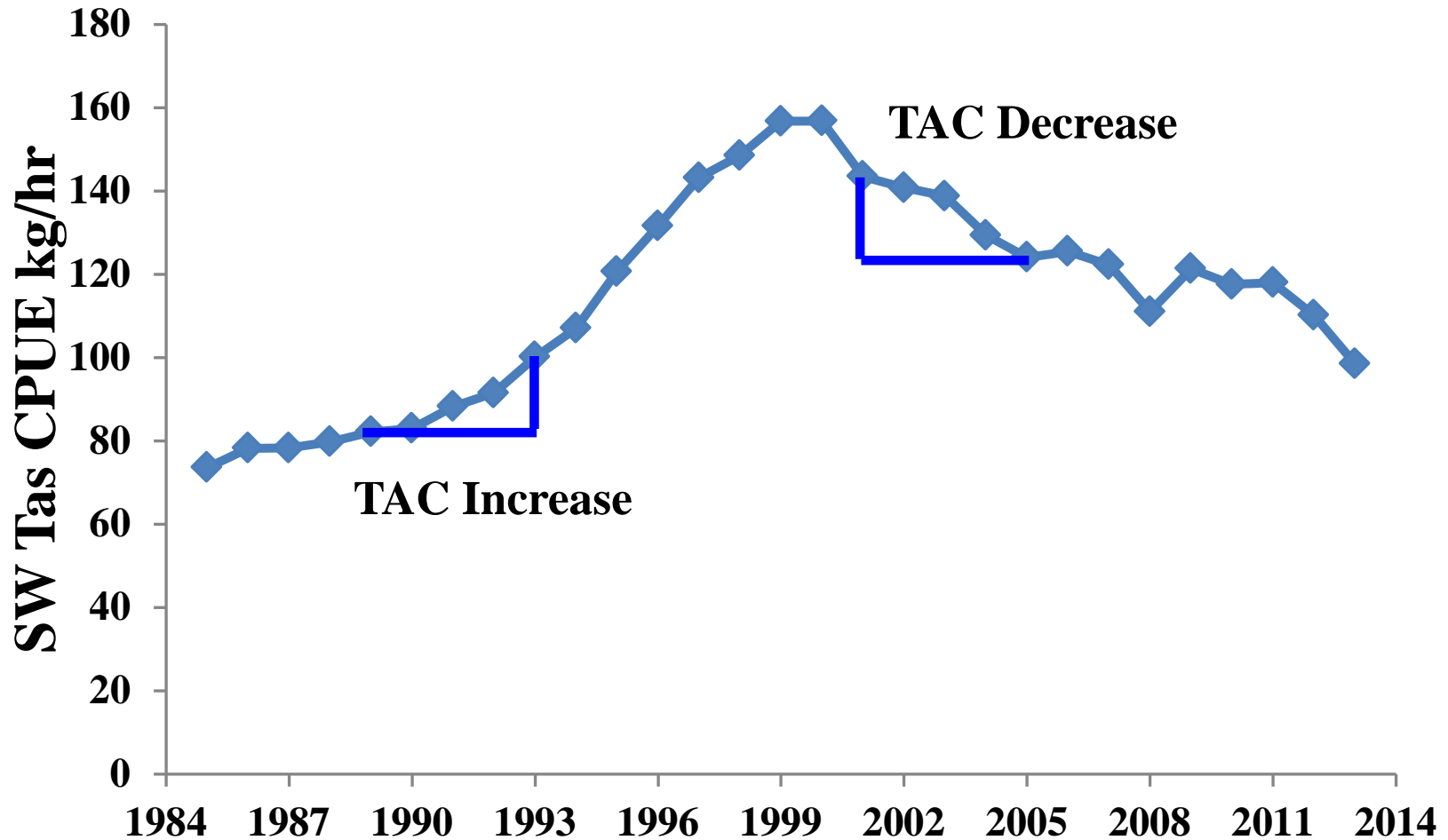
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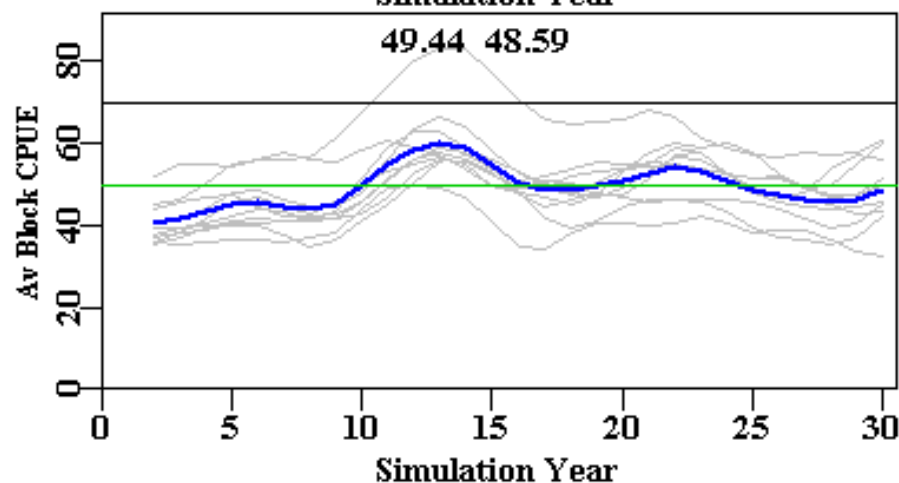
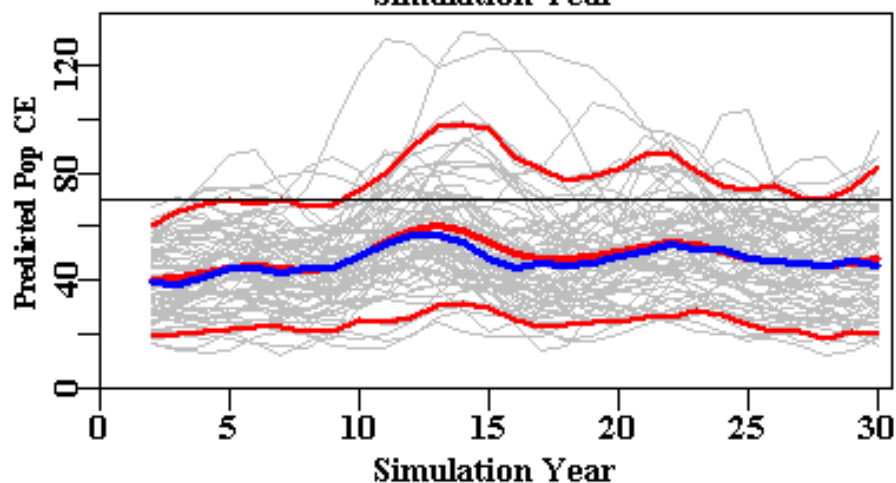
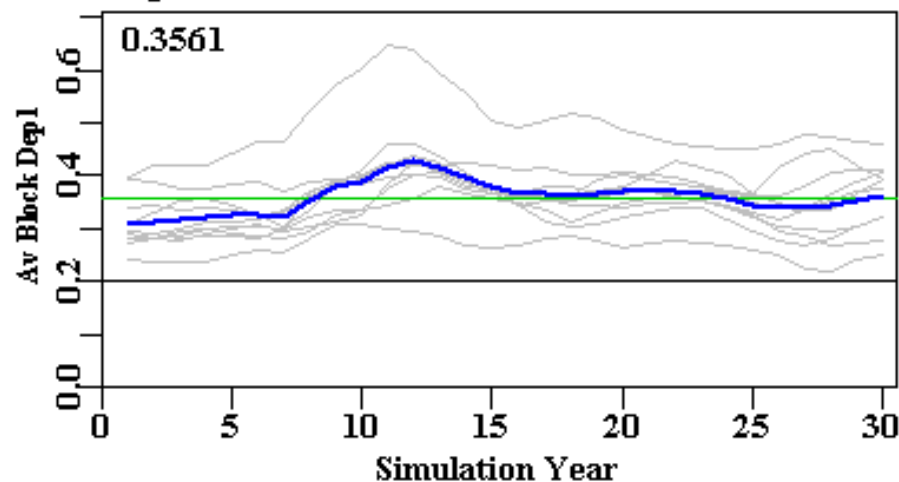
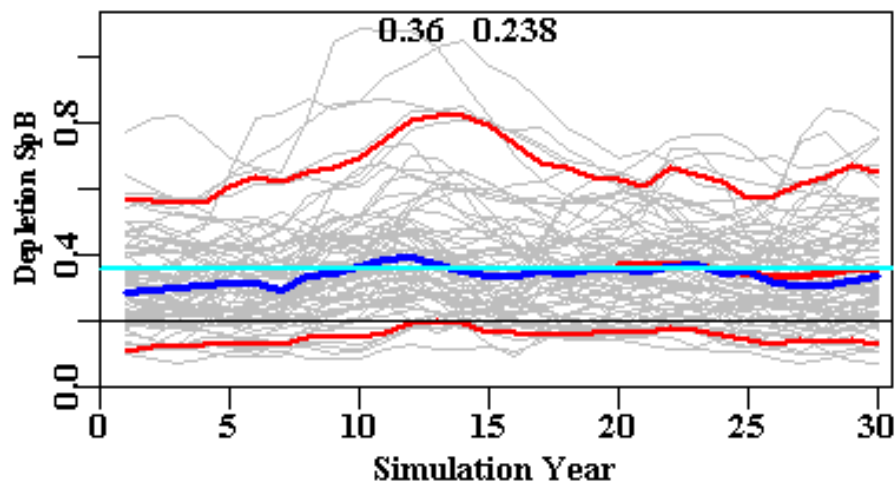
Different CPUE Harvest Control Rules

- Gradient of recent CPUE



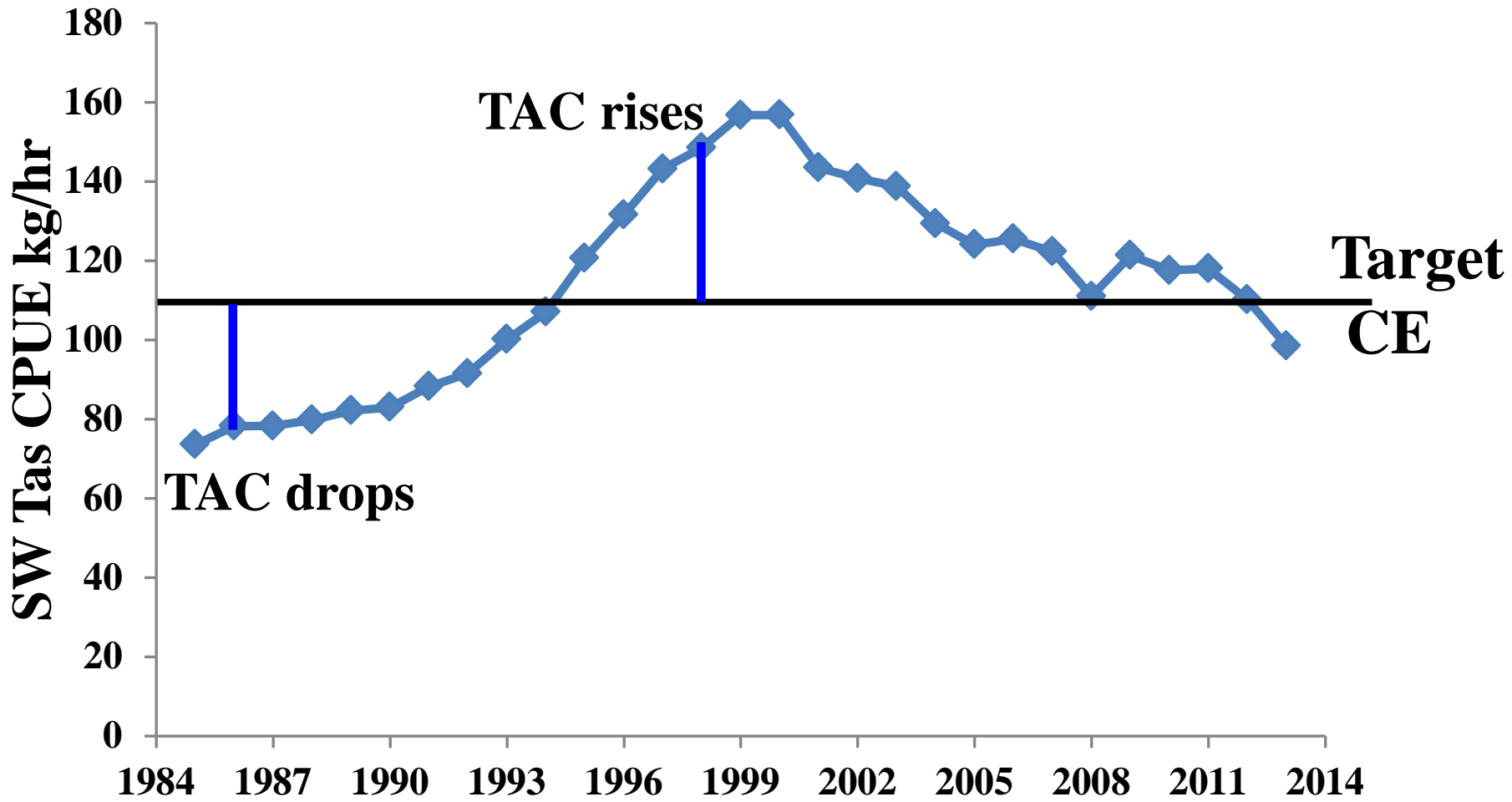
Typical MSE Output – Gradient HCR

GradHCR LML 138 TAC 700 Depl 0.225 CEPeriod 5

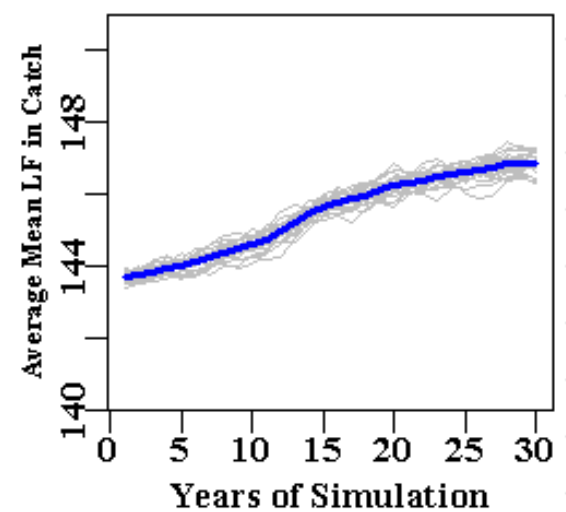
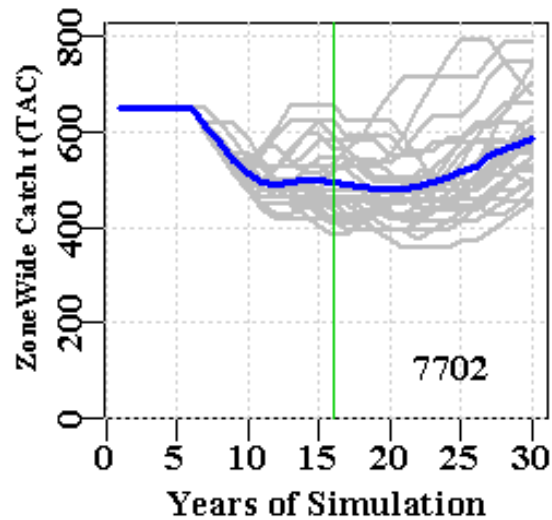
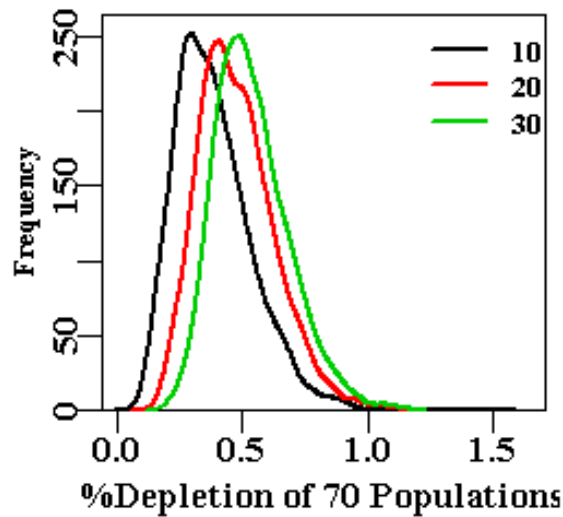
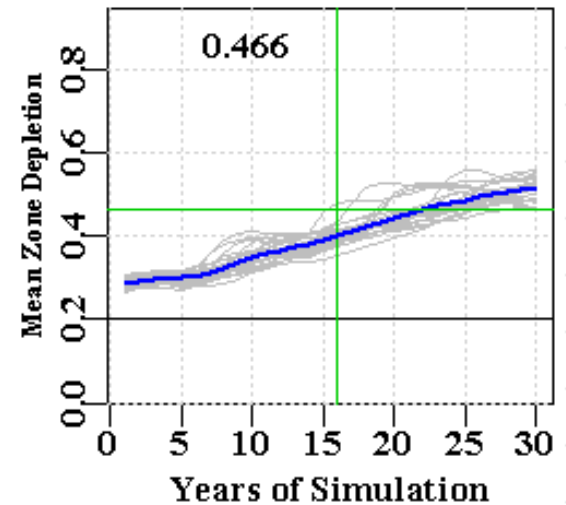
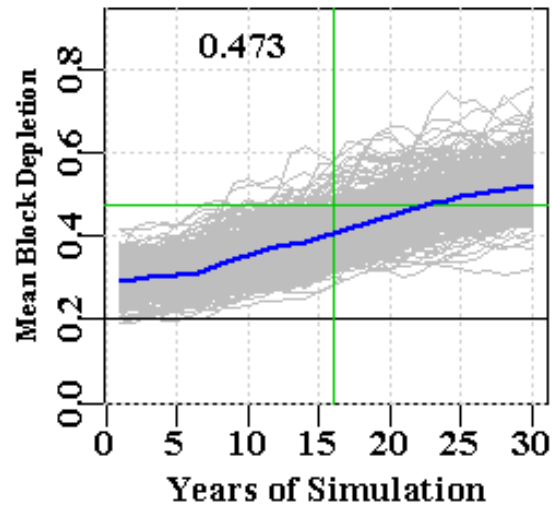
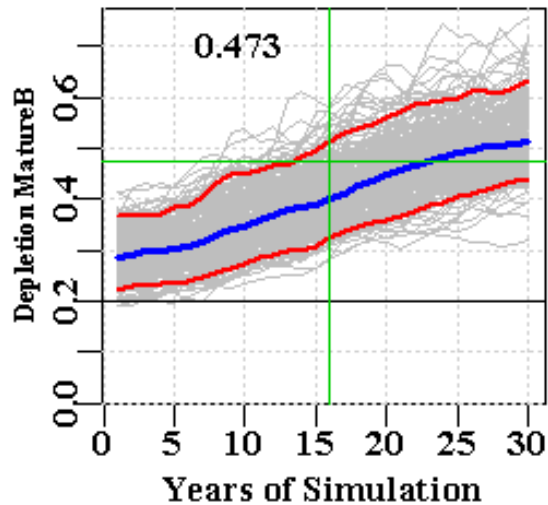


Different CPUE Harvest Control Rules

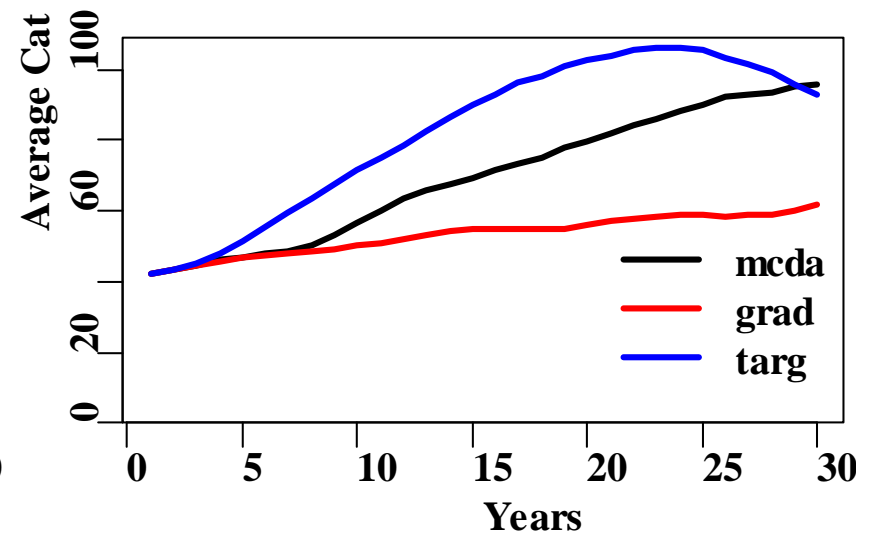
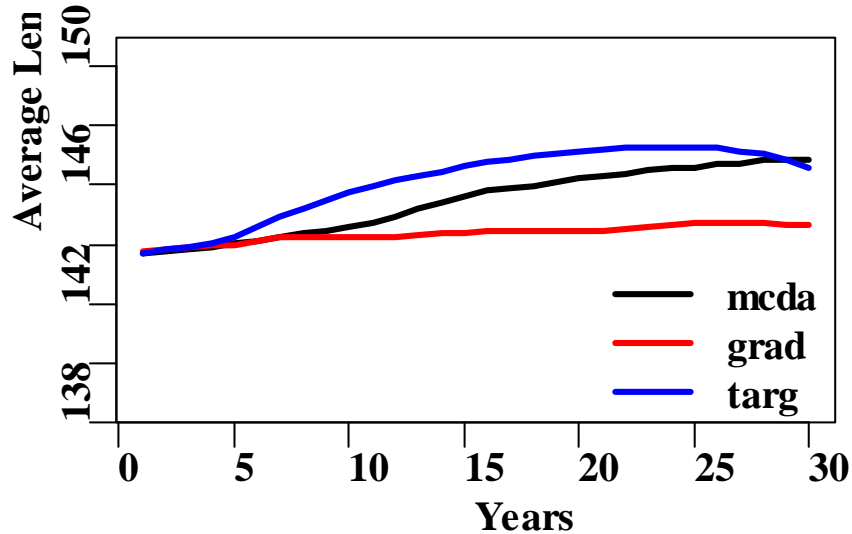
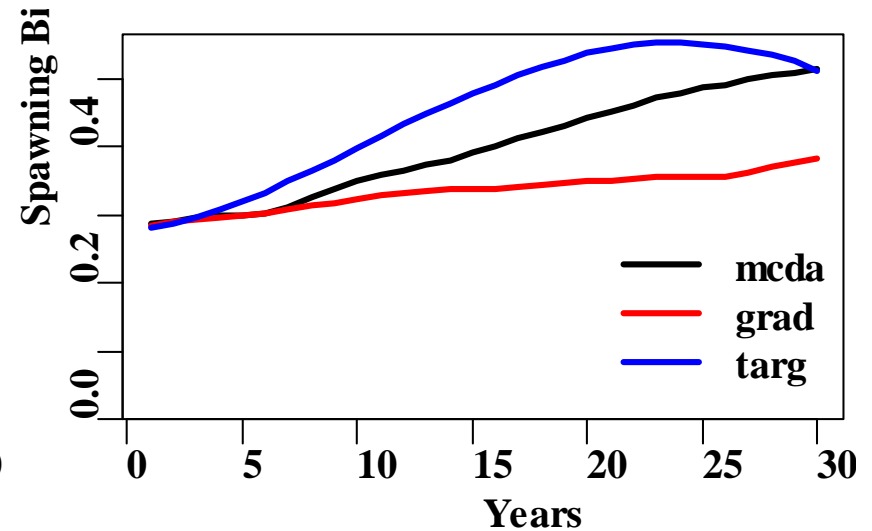
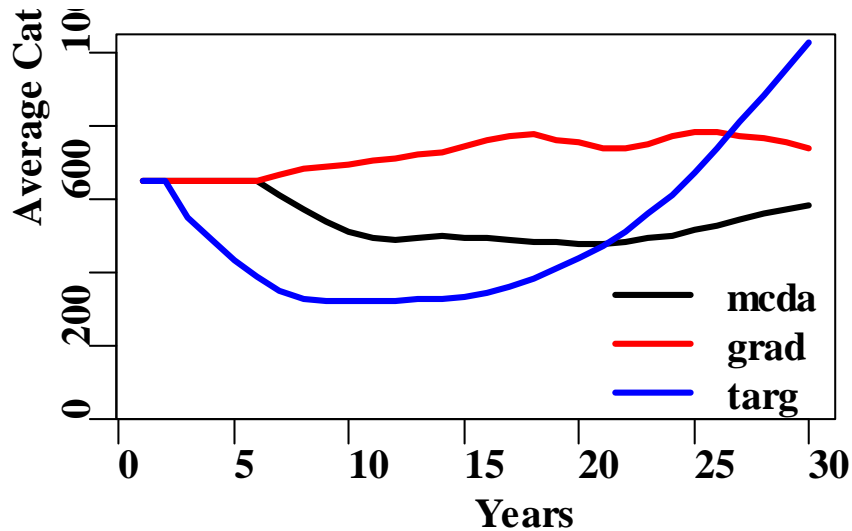
- **Target CPUE**



What if we use both: Gradient + Target: MCDA



Comparison of HCR: Trade-Off Outcomes



Conclusions

- Outcomes from management changes take years to become apparent.
- Different HCRs in same situation can lead to different outcomes.
- **Combining HCR can lead to less variable outcomes (depends!).**
- Big trade-offs between HCR outcomes (hence testing needed).
- Deciding between trade-offs not a job for scientists.
- CPUE still suffers from time-lag issues.

Spatially resolved statistics hold promise of more immediate responses.



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Thank you

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