Missed Opportunity for a Golden Handshake? Why Did So Many Fishers Stay After the Introduction of ITQs?

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Outline

- The Tasmanian rock lobster fishery
- Modelling the fleet
- Modelled vs real response
- Why the difference?
- Conclusion

The Tasmanian rock lobster fishery

Coastal fishery targeting single species *Jasus edwardsii*

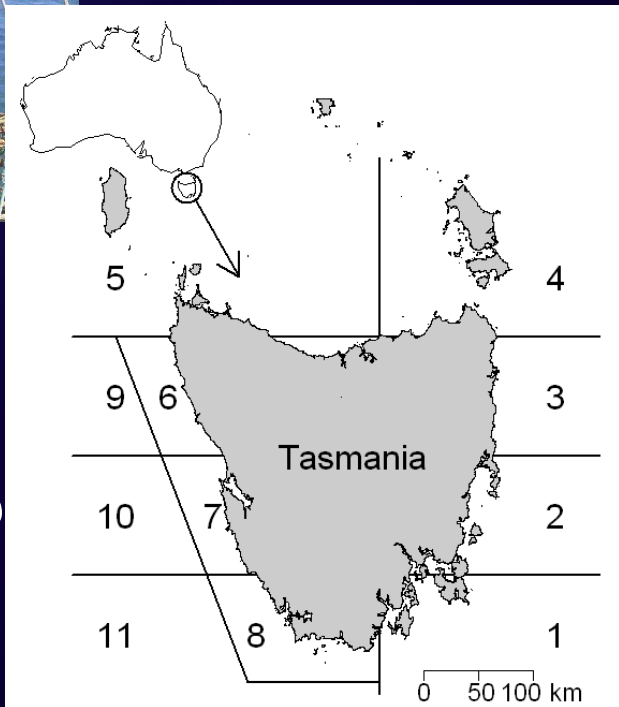
215 vessels fishing with baited traps

AUD $60 million return per year

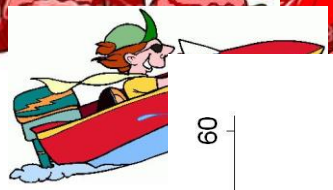
75% landings exported

ITQs introduced in 1998

- Cap on quota ownership (<2%)
- Restrictive TAC
- Initial allocation based on trap ownership



Heterogeneity of the fishery

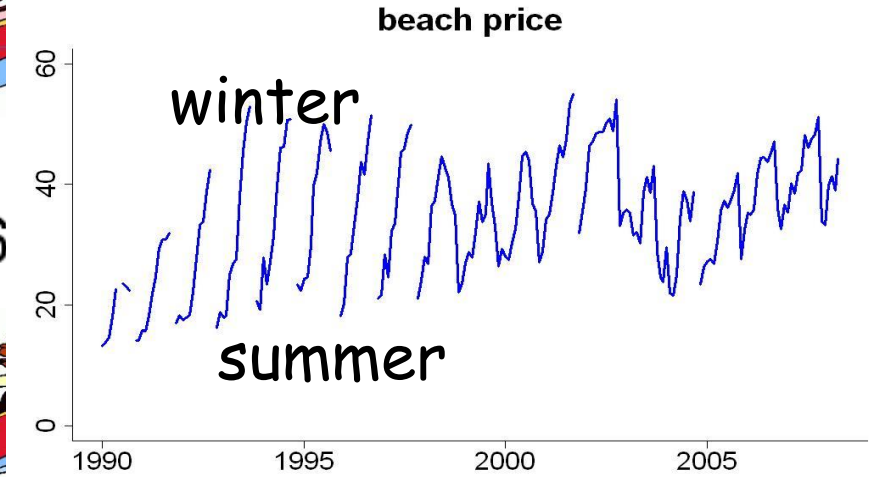


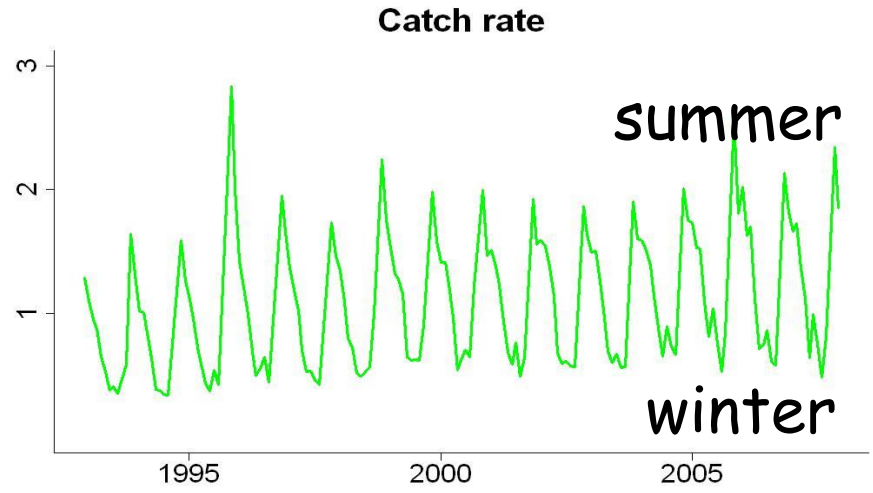
Spatial

- Size
- Colour
- Fishers

Seasonal

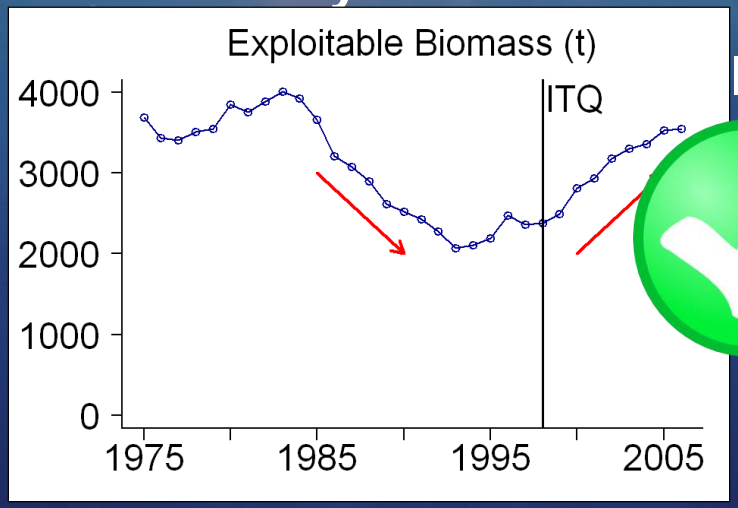
- Price
- Catch rates





Expected vs Observed impacts of ITQ

Sustainability of the resource



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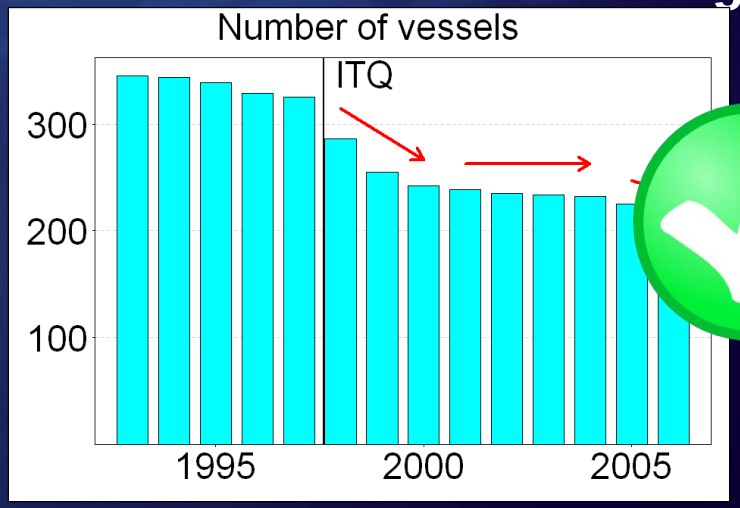
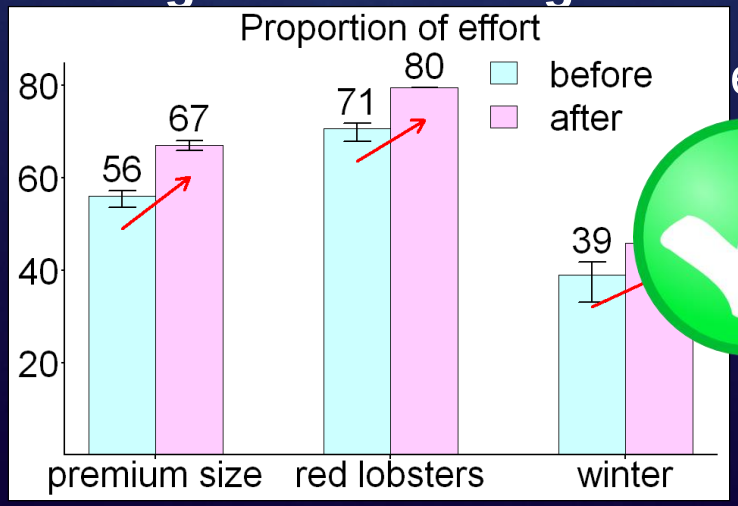
Rationalisation of the fishing fleet



fishers

Strategies maximizing return



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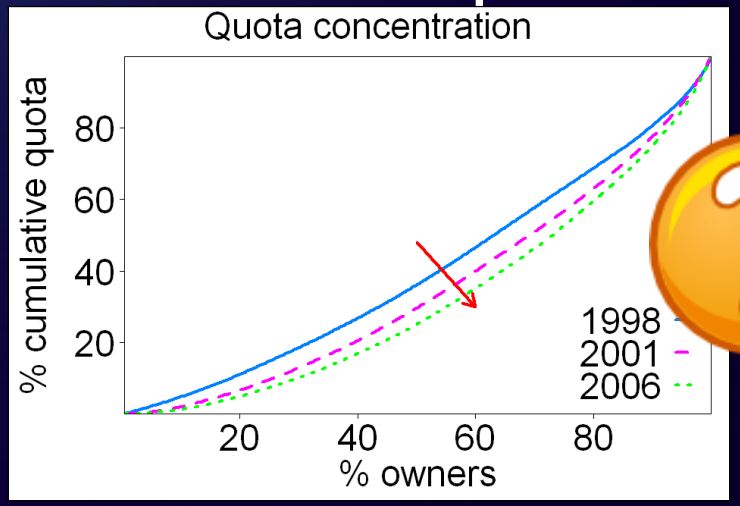
Concentration of quota ownership

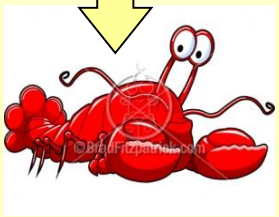


Modelling the fleet

Management scenarios
- TAC
- Aggregation limits
- …

Inputs
- catch & effort data
- biological parameters
- tagging data
- economic data
- quota info
- vessel descriptors

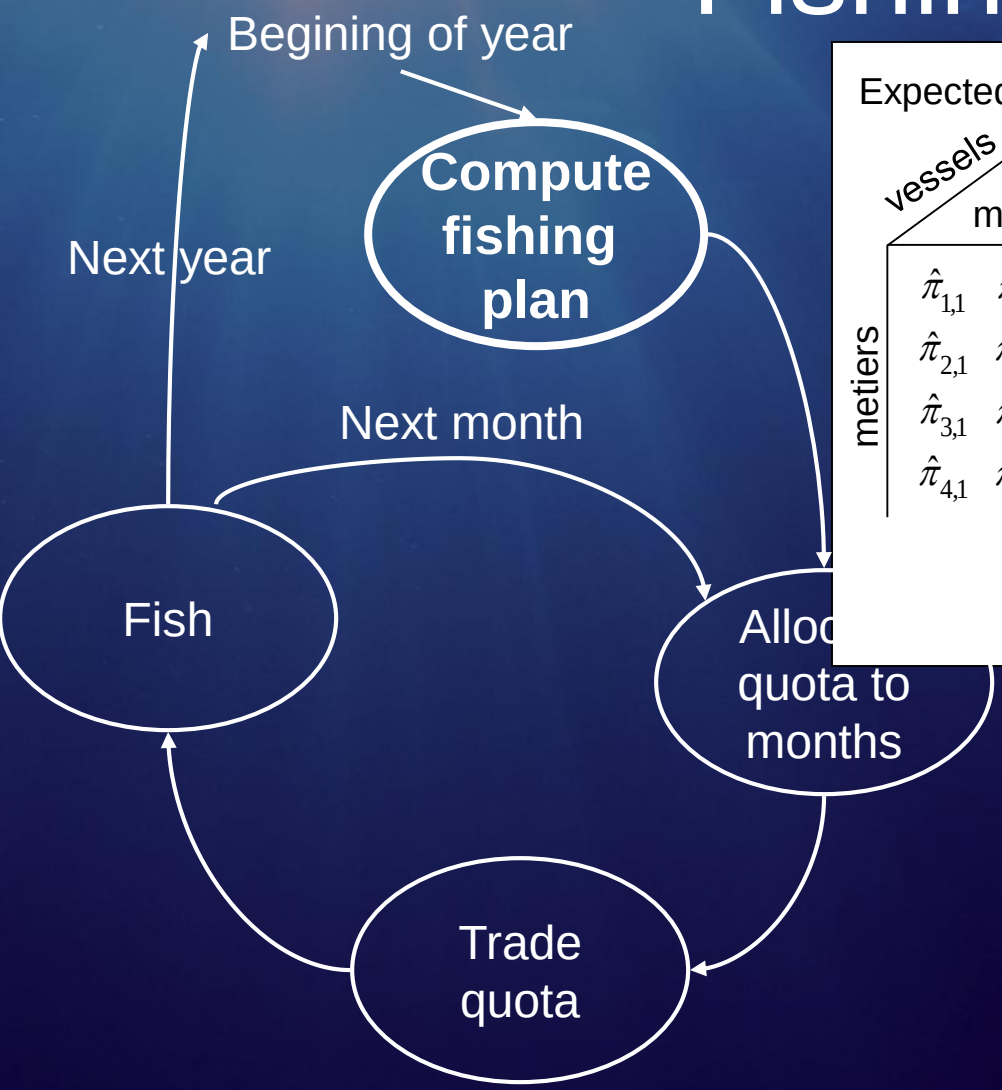
Lobster Price



Fleet → individual based
- quota allocation
- effort distribution (spatial & seasonnal)

Outputs
- economic statistics
- catch
- stock state

Fishing plan



Expected marginal profit $/kg

vessels

months

metiers

$$\begin{matrix} \hat{\pi}_{1,1} & \hat{\pi}_{1,2} & \hat{\pi}_{1,3} & \hat{\pi}_{1,4} \\ \hat{\pi}_{2,1} & \hat{\pi}_{2,2} & \hat{\pi}_{2,3} & \hat{\pi}_{2,4} \\ \hat{\pi}_{3,1} & \hat{\pi}_{3,2} & \hat{\pi}_{3,3} & \hat{\pi}_{3,4} \\ \hat{\pi}_{4,1} & \hat{\pi}_{4,2} & \hat{\pi}_{4,3} & \hat{\pi}_{4,4} \end{matrix}$$

Selection métier/month

Probability to be chosen

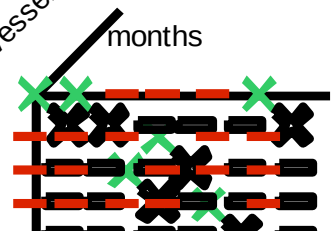
$$\propto \pi_{met,month}$$

Metier's choice

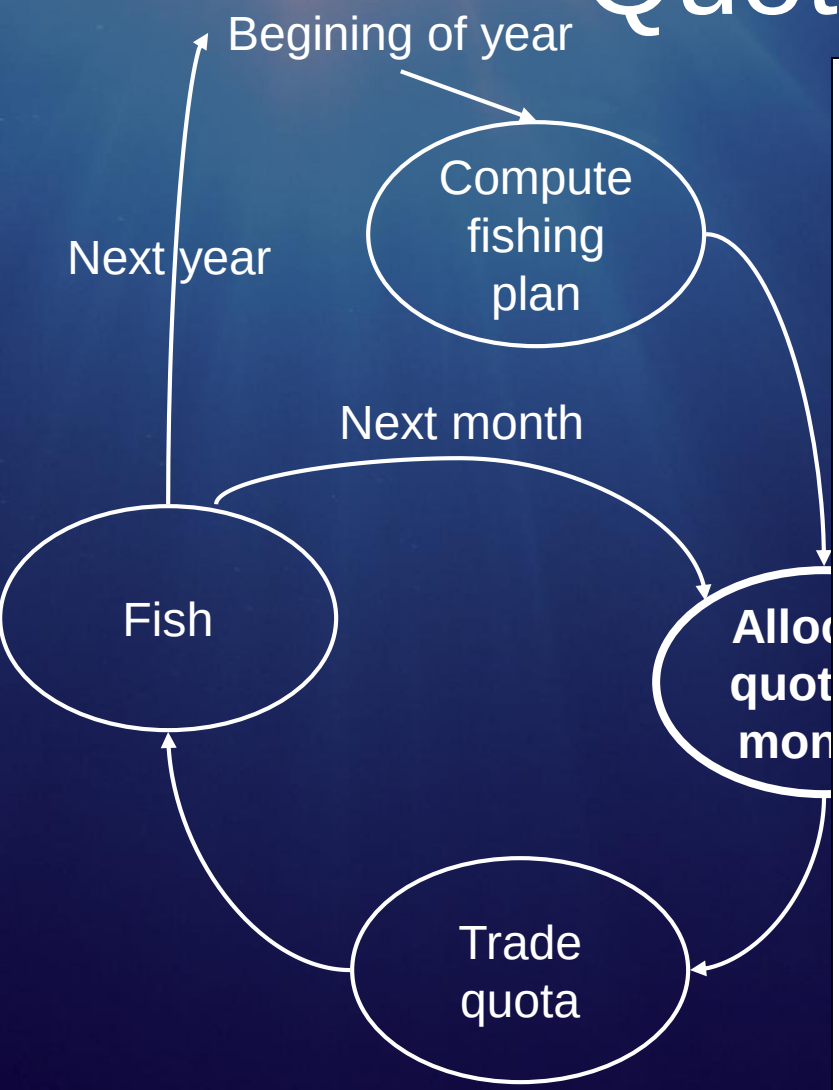
vessel

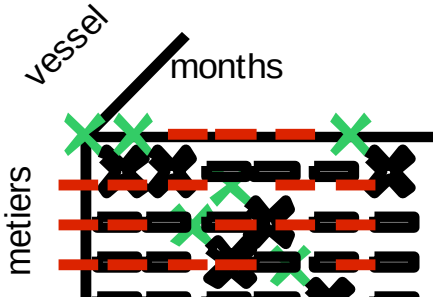
months

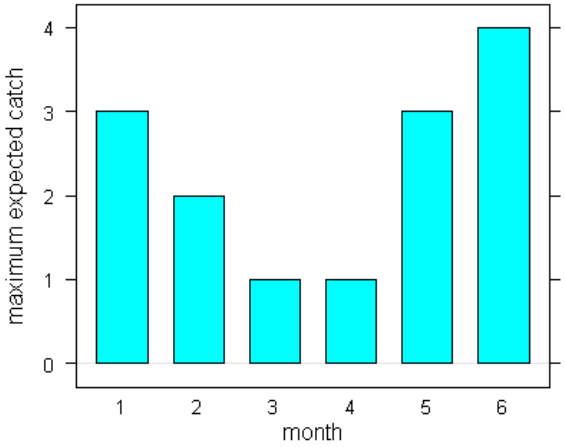
metiers



Quota allocation

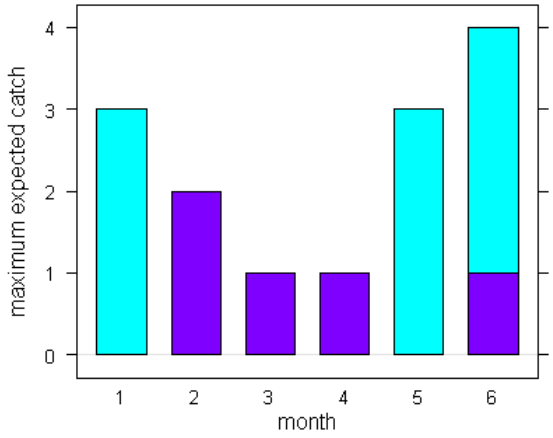




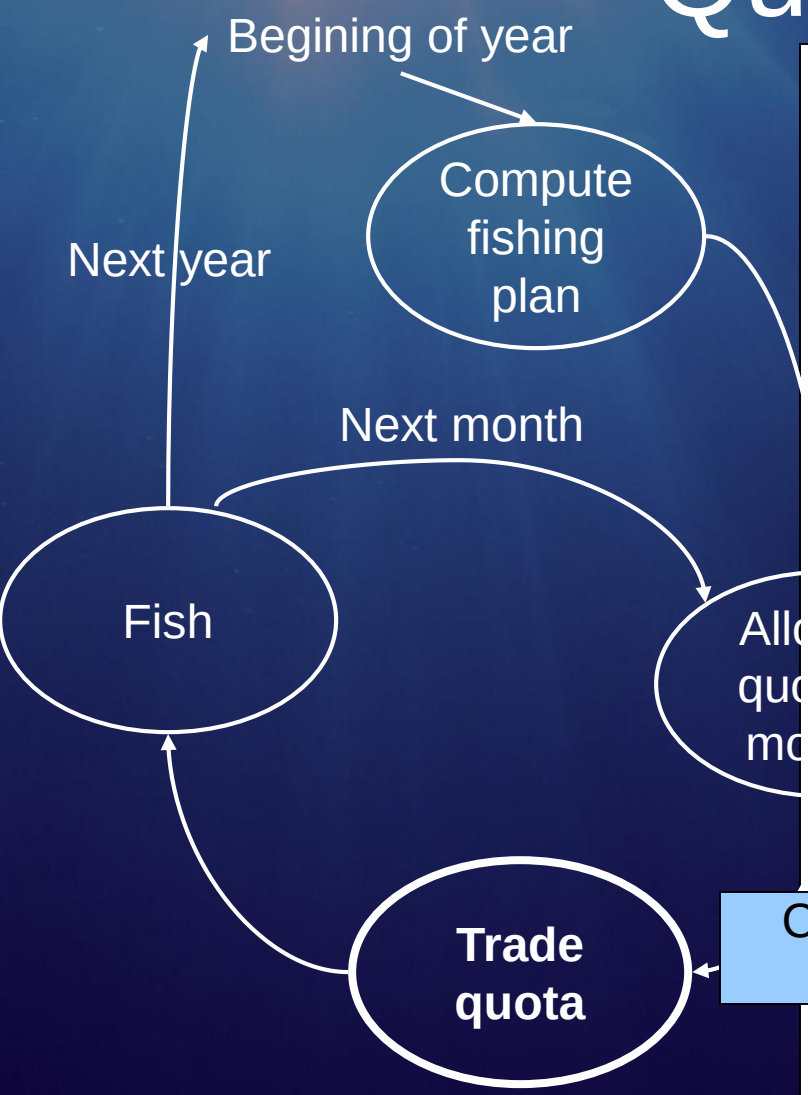


Total max catch:14
Quota owned : 5

$$\pi_4 > \pi_3 > \pi_2 > \pi_6 > \pi_5 > \pi_1$$



Quota trading



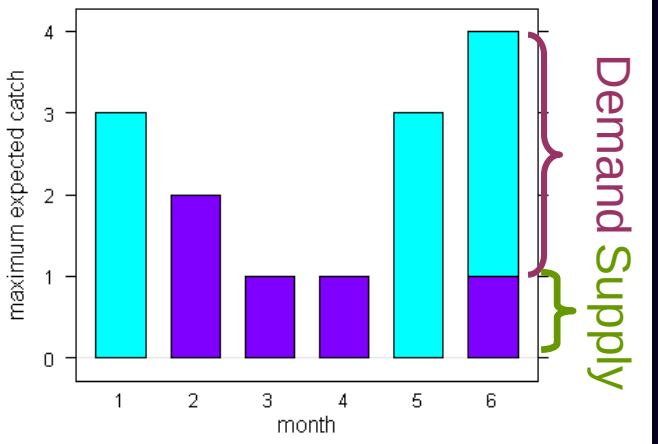
ID profitable months

$\pi_4 > \pi_3 > \pi_2 > \pi_6 > \pi_5 > \pi_1$

Profitable

Demand/ Supply

- Demand = Fill profitable months
- Supply = quota in non profitable months

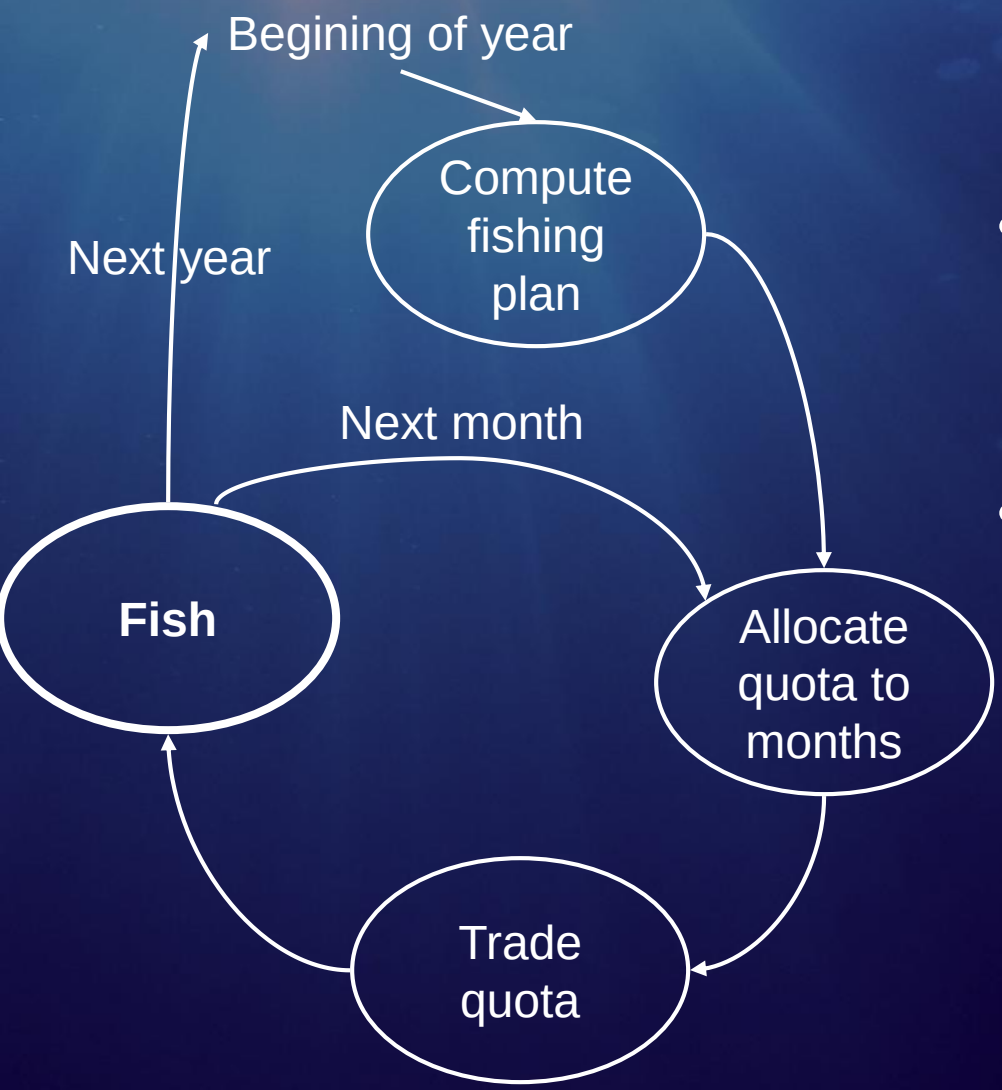


Compare Demand/ Supply

Supply>Demand
➔ decrease Q
Demand>Supply
➔ Increase Q

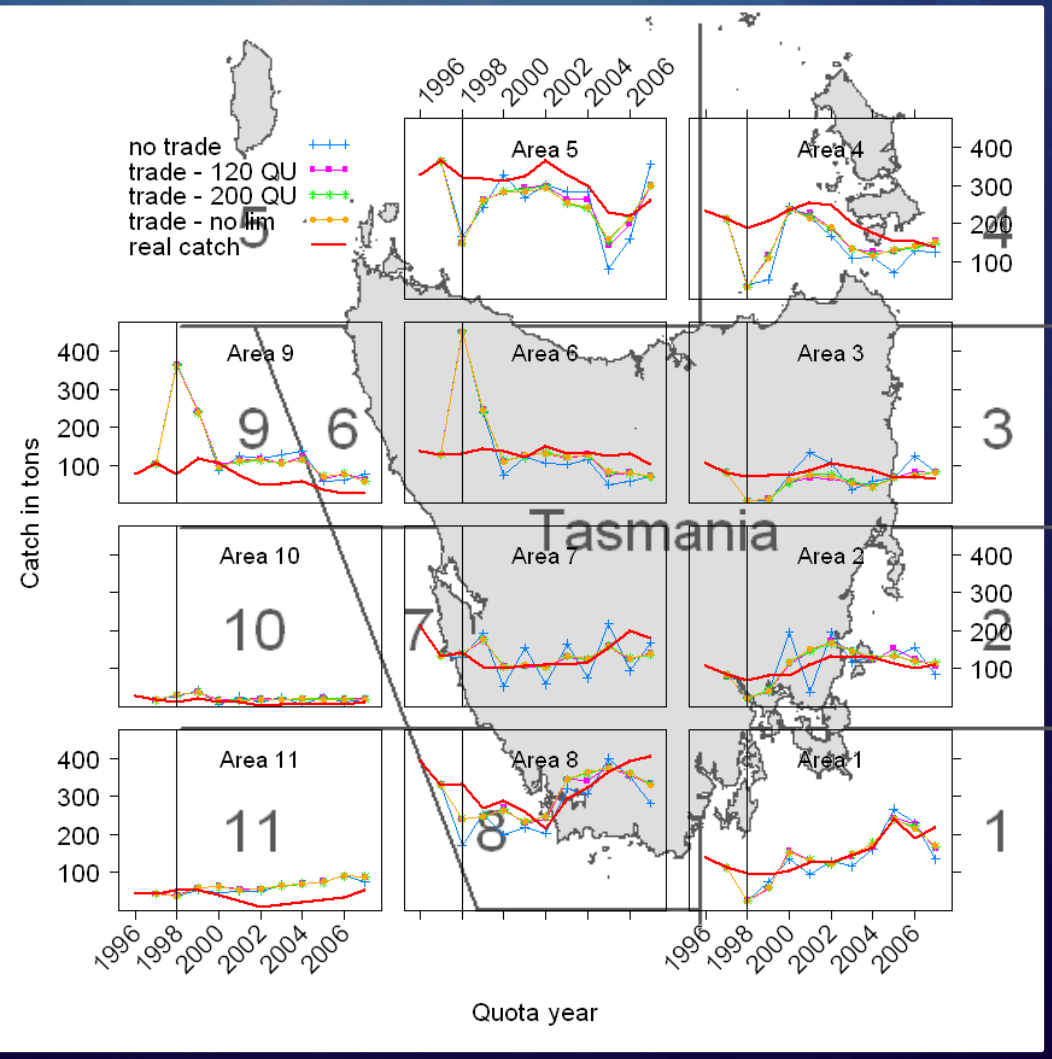
- Quota price Q

Fishing



- Allocate effort to areas for the month based on métier
- Simultaneous catch of quota allocated to the month

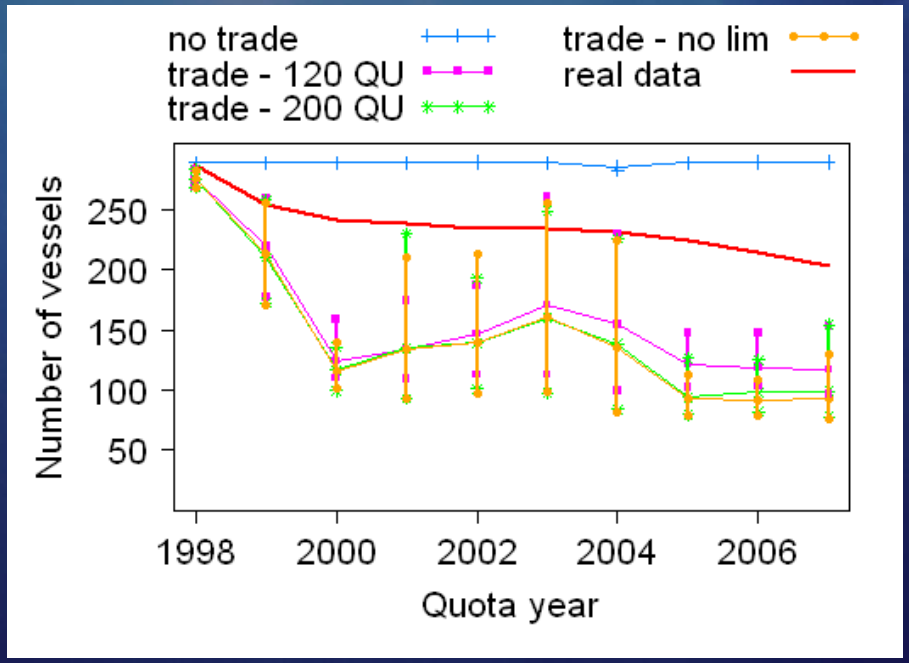
Modelled vs real response



Spatial distribution of catch:

- predictions close to reality
- anomalies in the western areas

Modelled vs real response



- Spatial distribution of catch:
  - predictions close to reality
  - anomalies in the western areas
- Vessel exit
  - Stronger decrease predicted than observed

Why the difference?

- Interviews with members of the industry
- Overestimation of fishing opportunities in some regions with high catch rates
  - Bad weather
- Market is less dynamic in reality
  - temporary transfers only ➔ very flexible
  - only profit driven ➔ higher demand
  - Perfect knowledge vs 1st hand information

Summary and Conclusion

- Fishery reacted as predicted in trend but not in intensity
- More inertia in the system than profit maximisation
- Non-economic factors influence decisions
  - Personal factors
  - Weather constraints
- Target “optimal” rather than “maximum” profit


Thank you!
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