



ningaloo
outlook

BHP



Energetics of Ningaloo Green Turtles

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Ningaloo Outlook – A partnership between BHP and CSIRO

WESTERN COASTAL/OCEAN & ATMOSPHERE
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Ningaloo Outlook is a BHP-CSIRO Industry-Science Marine Research Partnership investing A\$5.4 million over five years to gather new knowledge on the Ningaloo reef and its important ecological values

Green turtles at Ningaloo

- Form part of **globally significant population**
- Most **research** and monitoring focussed on **nesting environment**
- **Foraging ecology** and **energetics** of Ningaloo population
 - Response to **changing conditions**
 - **Dynamic Energy Budget** model

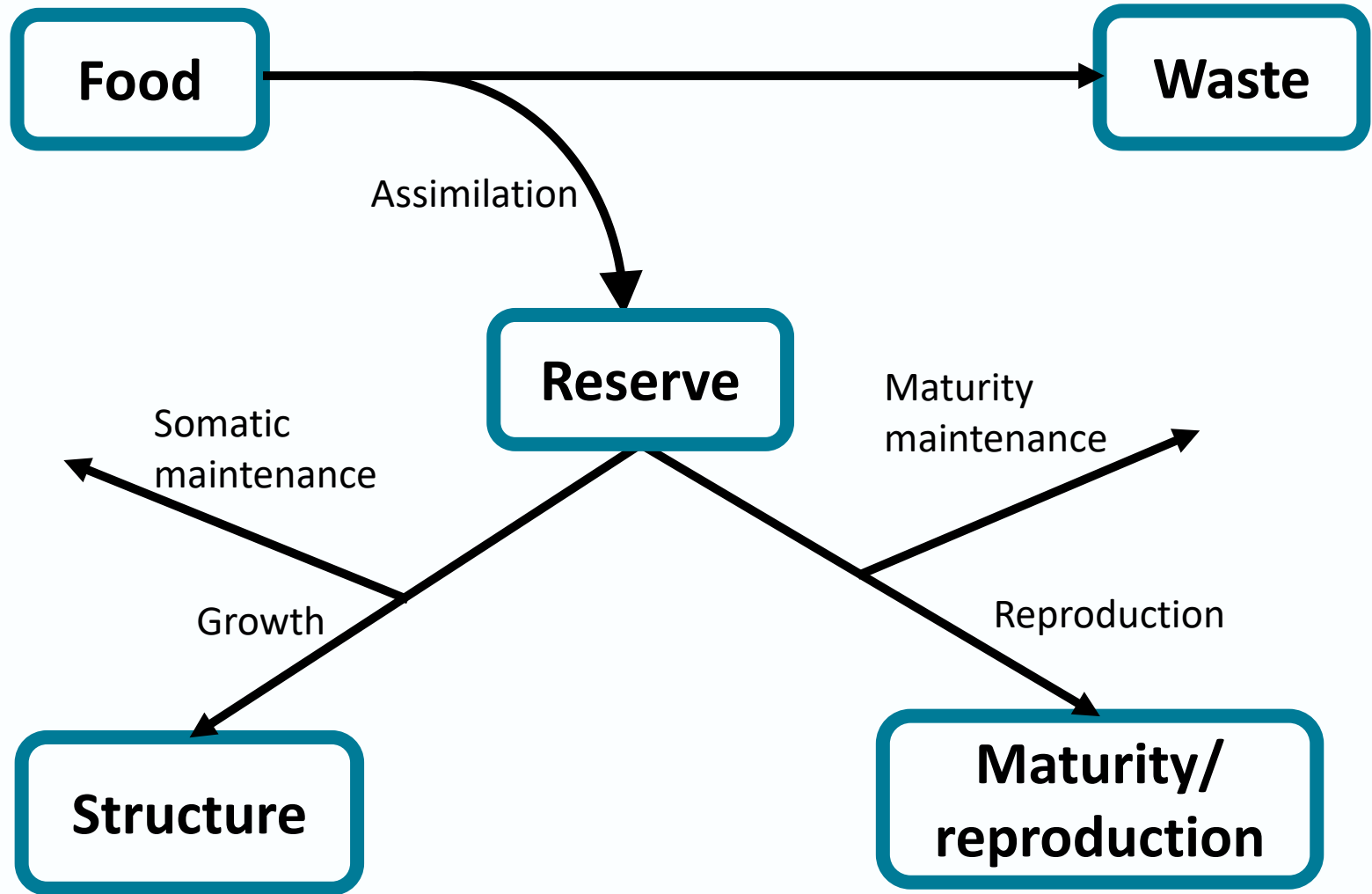


Project Aims

1. Investigate the diet and **variation** in **diet** of Ningaloo green turtles
2. Quantify aspects of **developmental energetics** of Ningaloo green turtles
3. Develop a **Dynamic Energy Budget (DEB) model** for green turtles
4. Assess the influence of **temperature** and **food availability** on aspects of Ningaloo green turtle **energetics** via DEB theory

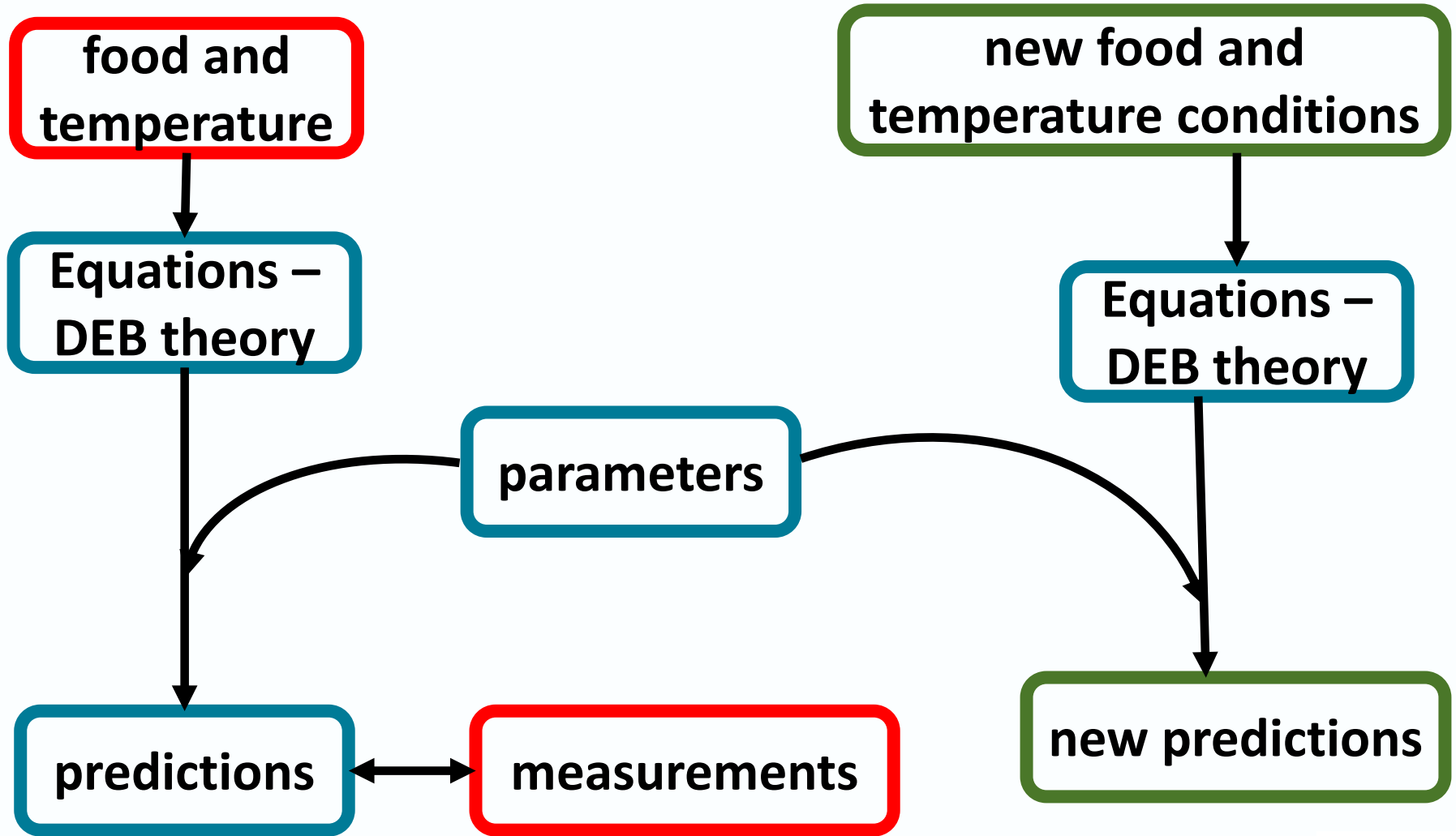


Dynamic Energy Budget

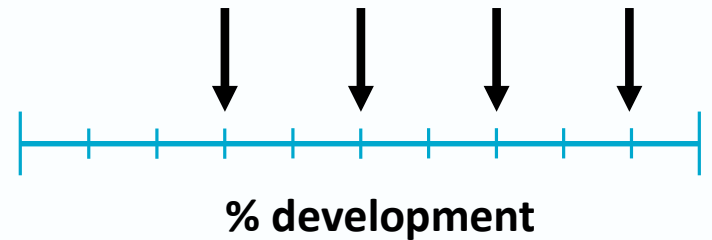
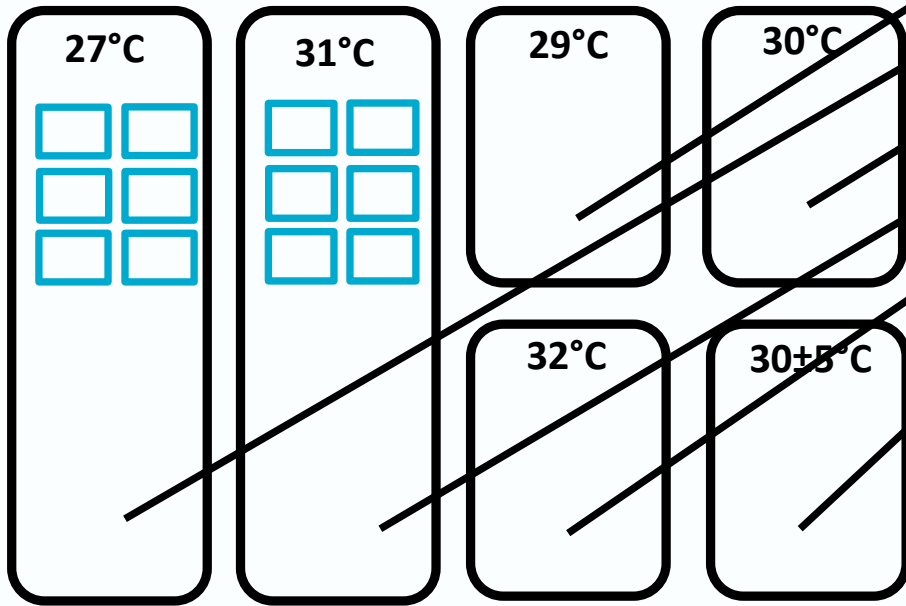


modified from Kooijman 2010

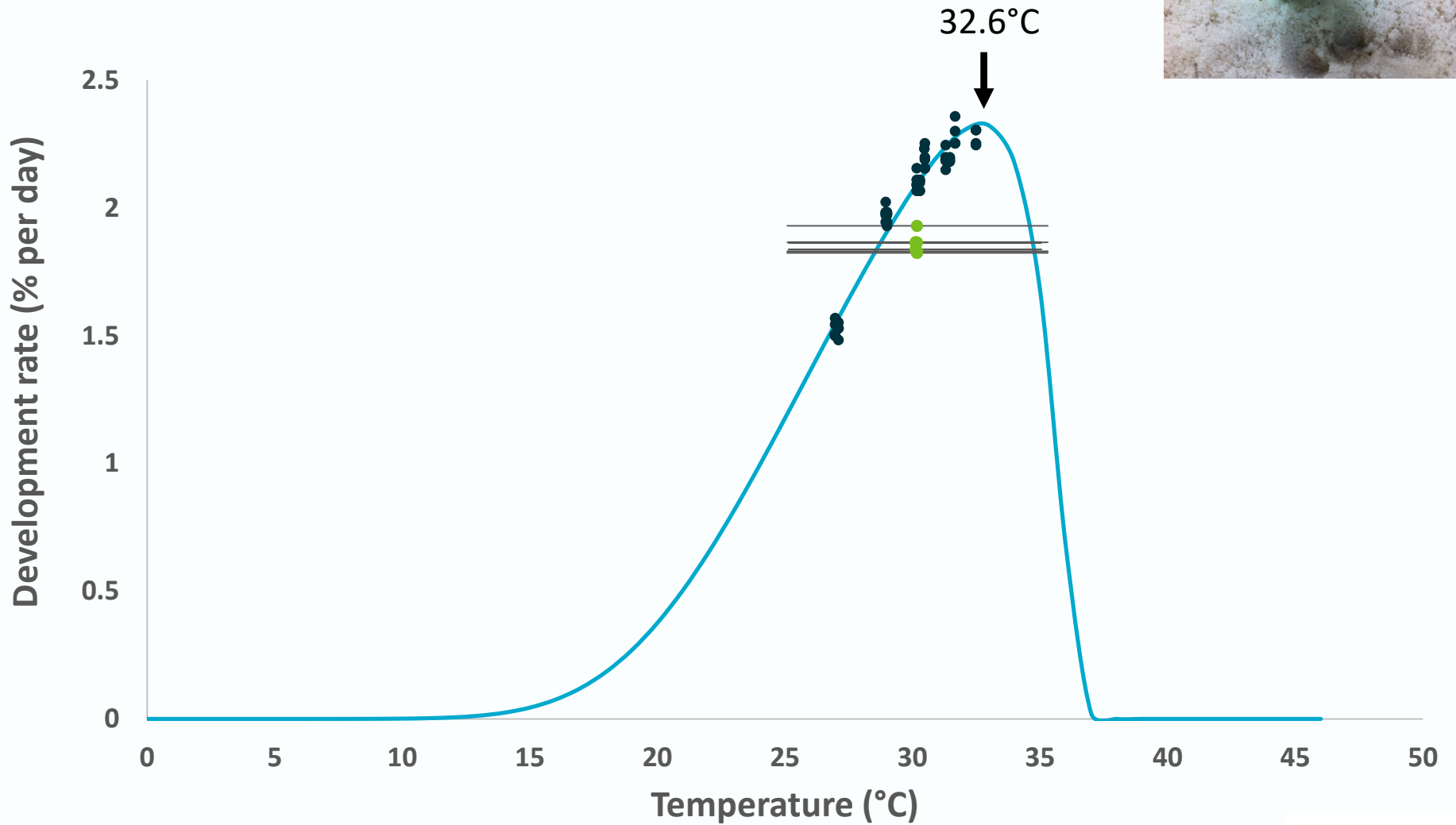
DEB – building a model



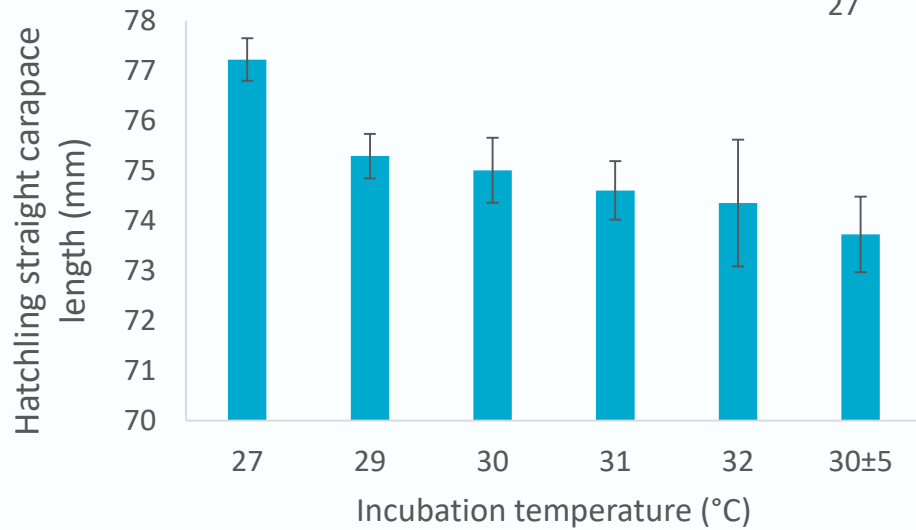
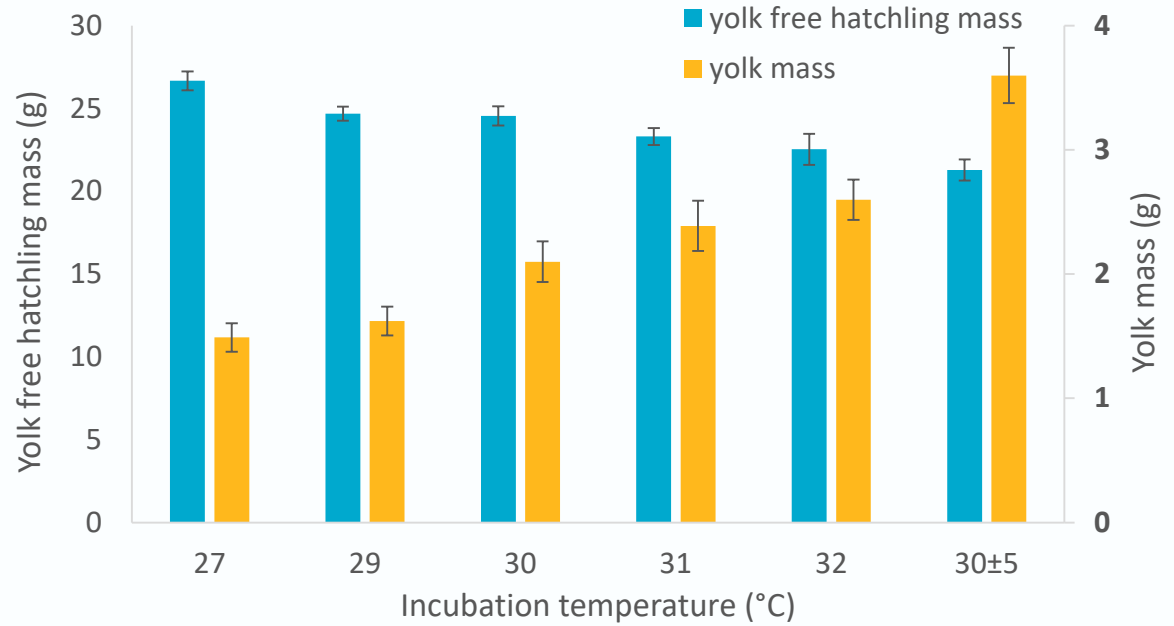
Incubation experiments



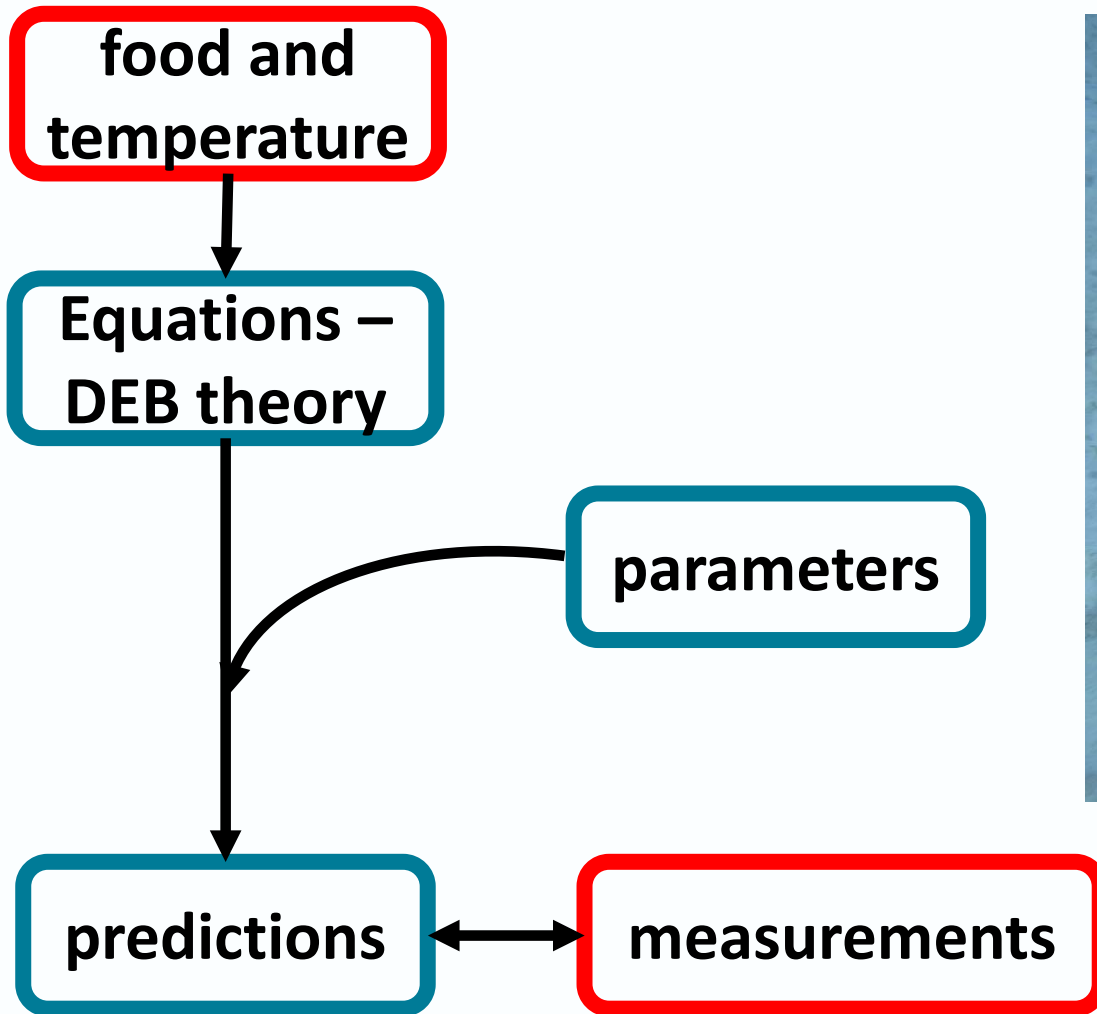
Development rate



Hatchlings

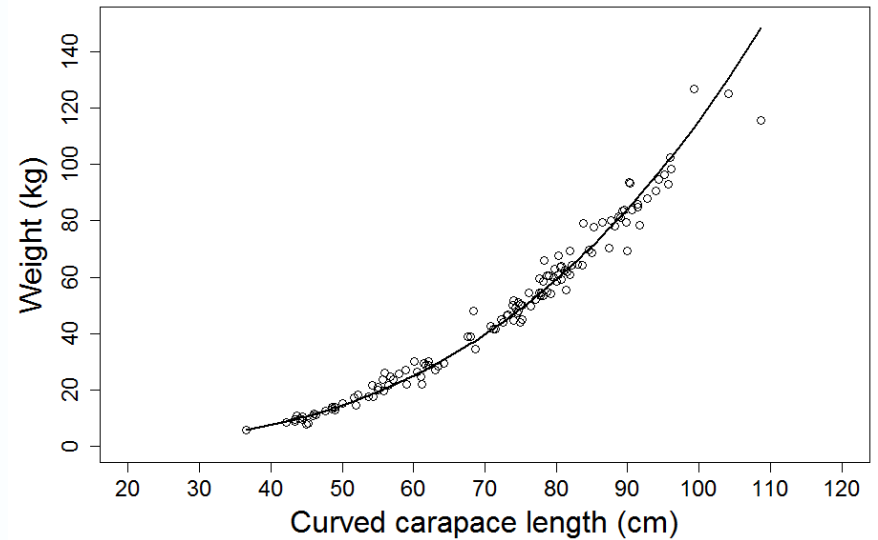
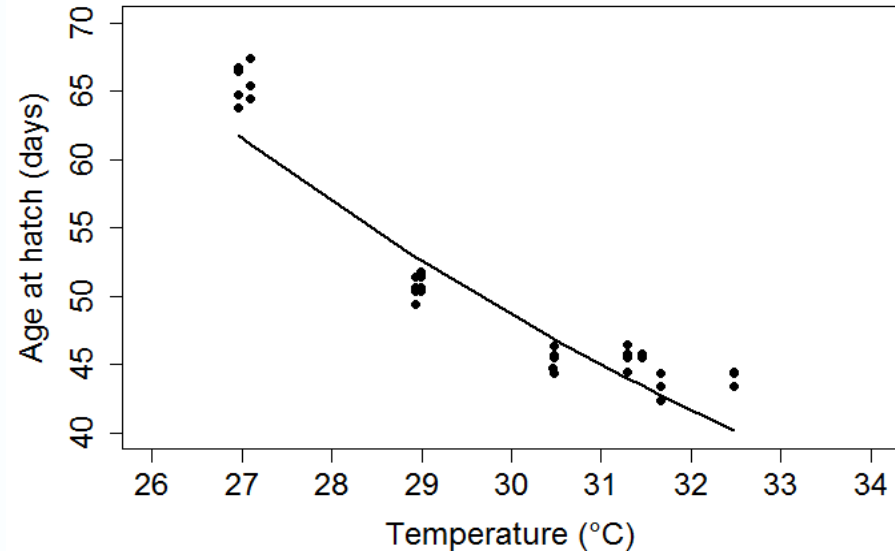


DEB – building a model for a green turtle

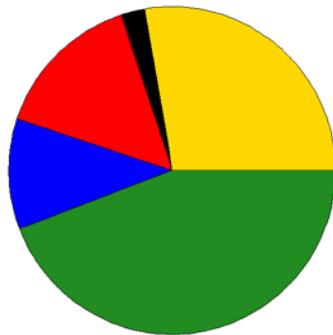
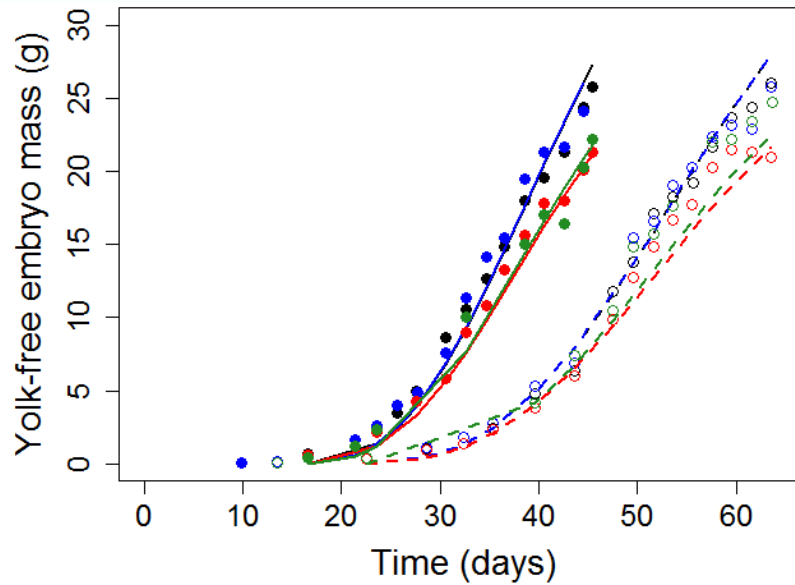


Model fit

Measurement	Input	Predicted
Straight carapace length at hatch (cm)	4.55	4.55
Age at puberty (yr)	29	23
Curved carapace length at puberty (cm)	91	97.98
Maximum reproductive output (eggs/day)	0.3	0.282



Investigating maternal effect

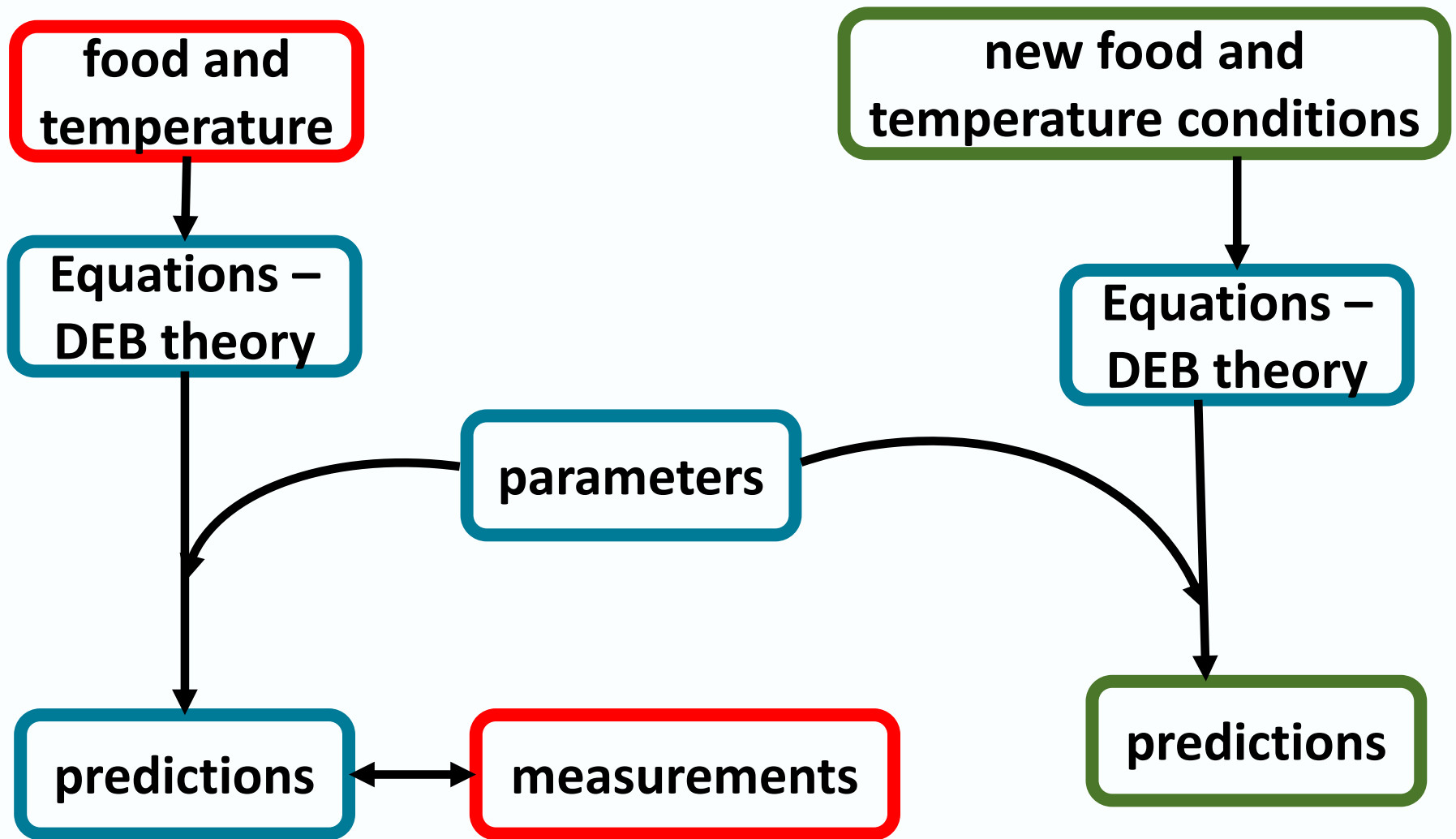


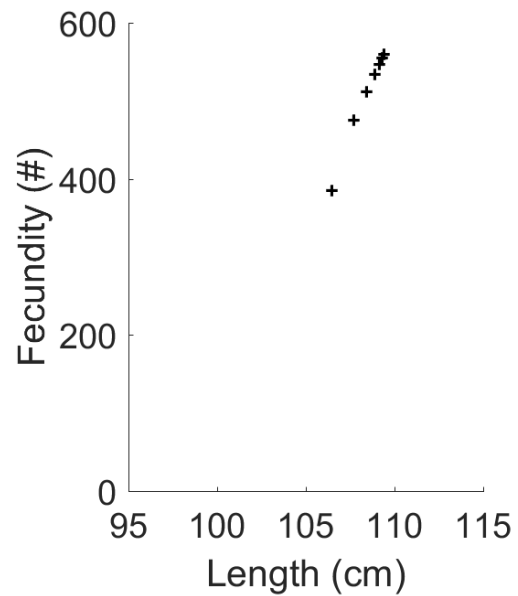
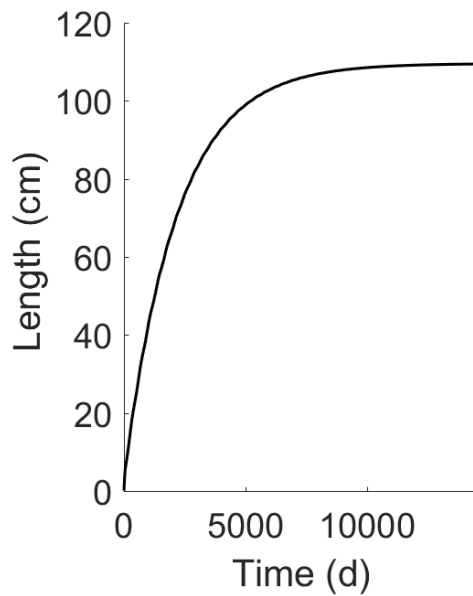
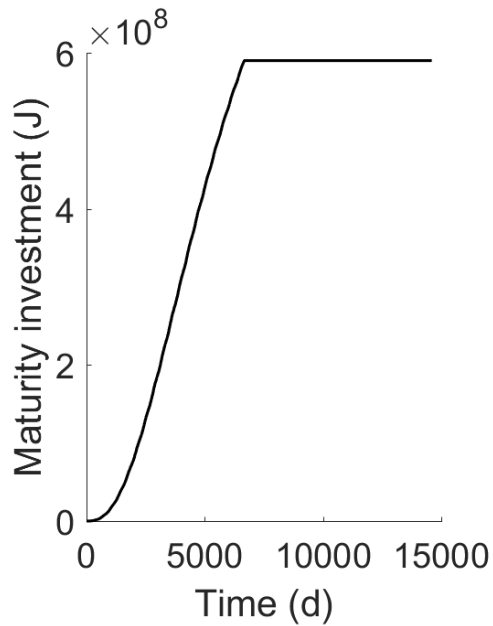
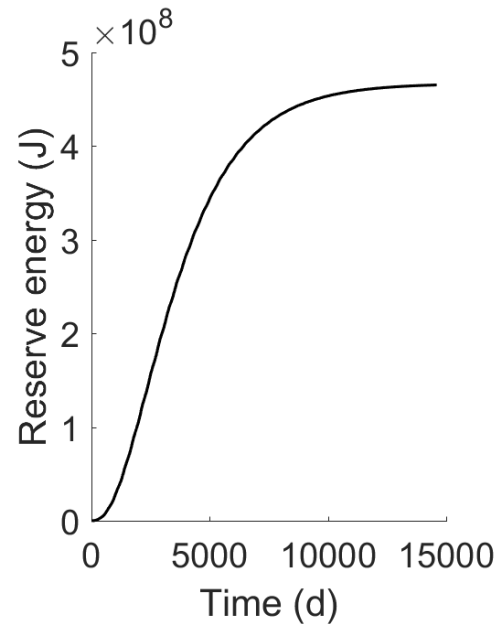
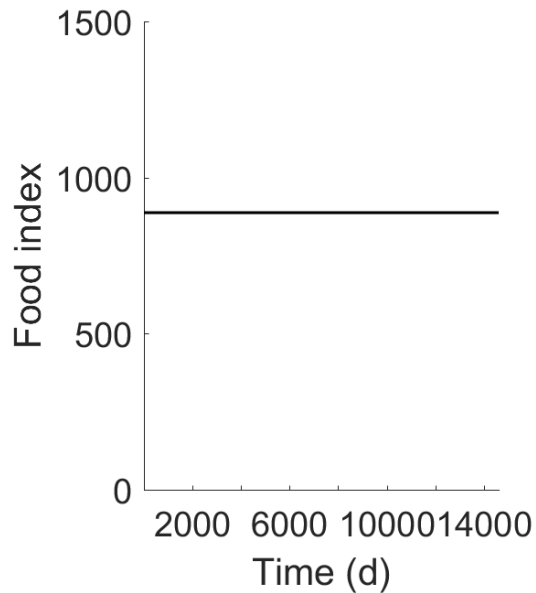
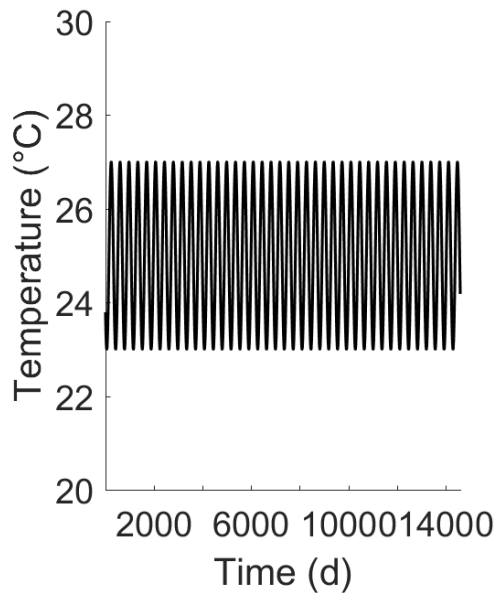
Clutch H: $e_b = 0.65$

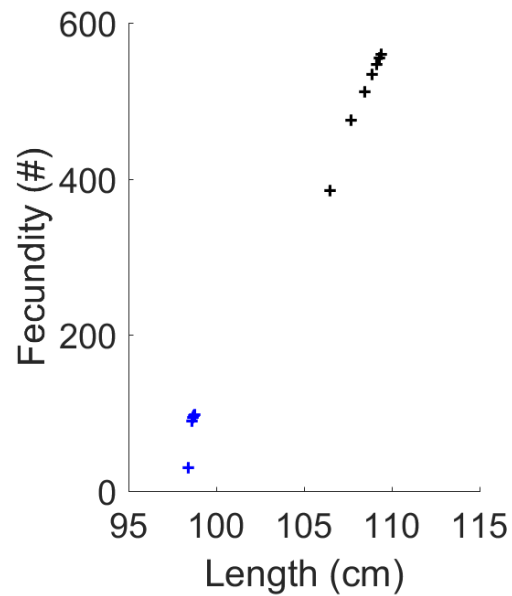
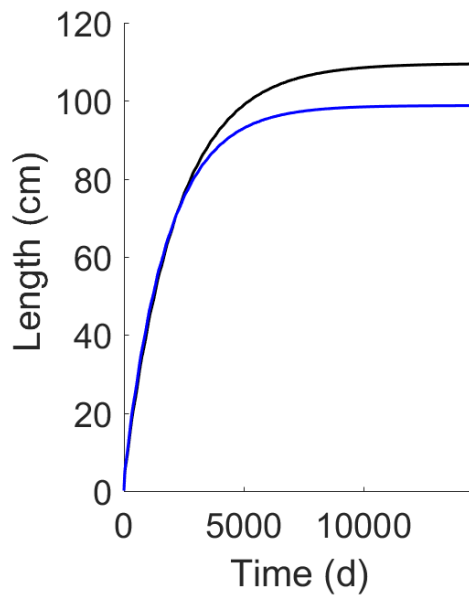
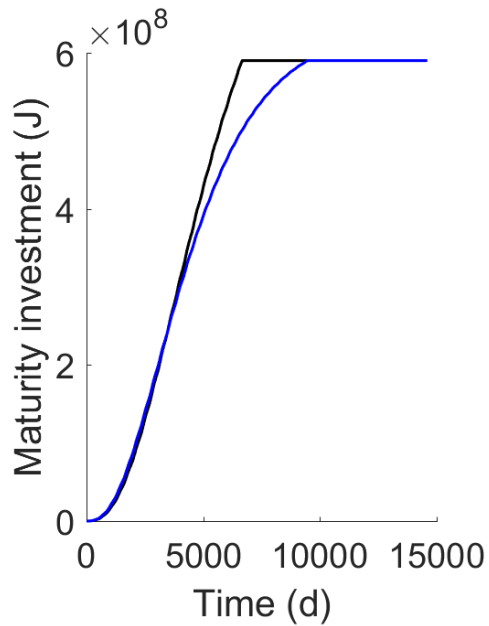
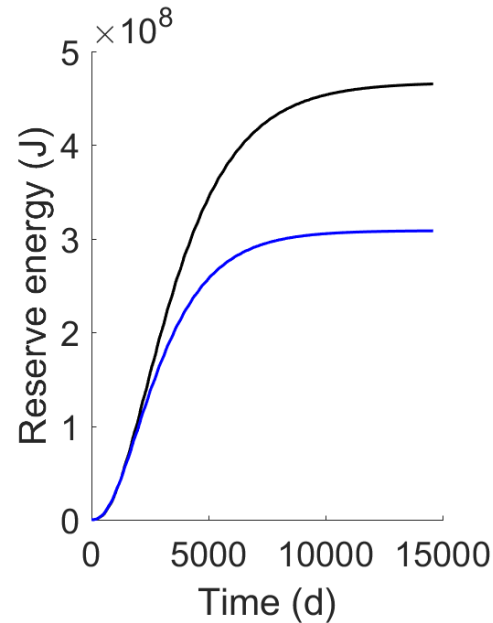
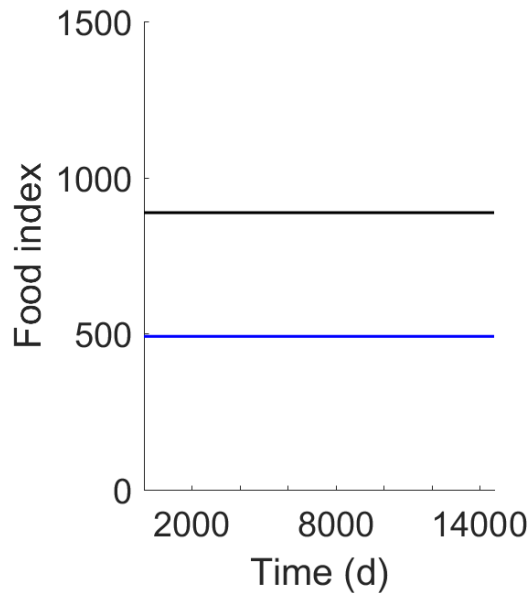
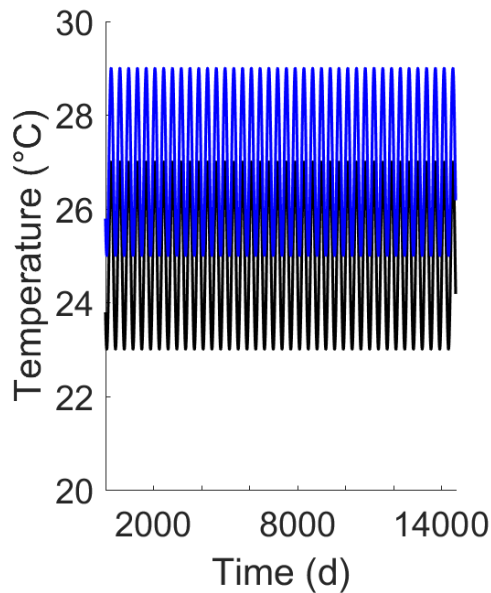


Clutches B and F: $e_b = 1$

- Reserve
- Somatic maintenance
- Maturity maintenance
- Maturity
- Growth overhead
- Structure







Acknowledgements

- BHP-CSIRO Ningaloo Outlook Marine Research Partnership
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Thank you!



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Theme 3 Question Time





Symposium Closing Remarks

