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## COLLOQUIUM

# Modelling marine food webs to study their sustainability in a changing world

Dr Fernanda Valdovinos (UC Davis, USA)

**DATE:** Monday, 8 December 2025 | 16h00–17h00 SAST

**VENUES:**

- **Stellenbosch University:** NITheCS Seminar Room, Merensky Building
- **North-West University:** Seminar Room K310, Physics Building G5
- **University of the Witwatersrand:** Room P215, 2nd Floor, Physics Building
- **Online**

--- A recording of the talk will be published on the NITheCS YouTube channel afterwards ---

### ABSTRACT

This talk presents an integrated network approach to modelling marine food webs, focusing on their responses to environmental change and evaluating their sustainability.

Four interconnected projects collectively expand the scope and impact of this framework:

- The first project provides the foundation by investigating how alterations in coastal productivity and artisanal fisheries along the Chilean coast affect food web dynamics, emphasising the links between ecological processes and human activities.
- The second project incorporates economic dynamics into food web models, developing a bioeconomic framework to assess fishery sustainability under combined ecological and economic pressures.
- The third project examines environmental variability, evaluating how fluctuations in phytoplankton subsidies affect species extinction risks and revealing cascading bottom-up effects on food web stability.
- The fourth project addresses a critical modelling gap by resolving patterns of primary productivity, establishing essential baselines for understanding energy flow, food web dynamics, and community composition.

Together, these projects showcase the growing power of this approach to deepen our understanding of marine ecosystems and provide valuable insights for sustainable management in the face of global change.

### BIOGRAPHY

Dr Fernanda Valdovinos is a theoretical ecologist and network scientist studying the structure and dynamics of ecosystems facing anthropogenic perturbations. She focuses on the mechanisms empirical research has shown to be important for the dynamics of ecological systems. Her group integrates those mechanisms into mathematical models of ecological networks that they interrogate using computers, mathematical analysis and biological intuition, and whose predictions they test with empirical data.

She earned her PhD in Ecology and Evolutionary Biology at the University of Chile, spending time in UC Berkley, USA, and CSIC in Doñana, Spain, during her doctoral studies. After completing postdoctoral research at the University of Arizona, she started her first professorship in 2018 at the University of Michigan, Ann Arbor. She joined UC Davis in 2020.



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