

Postdoctoral Research Fellow (2 years)

KwaZulu-Natal research node:

National Institute for Theoretical and Computational Sciences **NITheCS**

WP5: Coupling and Dynamics of Anthropic and Natural Ecosystems (KwaZulu-Natal)

We invite applications for a Postdoctoral Research Fellow to join an interdisciplinary project investigating the coupled dynamics of human and natural ecosystems at the provincial scale, with a focus on KwaZulu-Natal (KZN), South Africa. The project aims to model and simulate interactions between agriculture, hydrology, land use, socio-economic systems, and natural aquatic and terrestrial ecosystems to identify pathways toward sustainable equilibrium.

The candidate selected by the project team will be expected to apply formally to the NITheCS Postdoctoral Fellowship Programme (Reference No. NITHECS/2026/PD9), with endorsement from the project leaders. If successful they will be based at UZKN.

Key Duties and Responsibilities to include

- Develop and implement mathematical or computational models linking agriculture, hydrology, and ecosystem dynamics.
- Identify, acquire, and critically analyse relevant environmental datasets from multiple sources and apply data analytics for land-use mapping and ecosystem monitoring.
- Publish research findings in peer-reviewed journals (target: 3-4 publications per annum as a team contribution).
- Co-supervise postgraduate students (Master's and PhD level).
- Participate in workshops, interdisciplinary meetings, and stakeholder engagement activities.

Minimum Requirements

- PhD (completed within the last 5 years) in Applied Mathematics, Environmental Modelling, Ecology, Hydrology, Earth Systems Science, or a closely related quantitative field.
- Strong background in mathematical modelling and/or computational simulation of complex systems.
- Experience with data analysis (e.g., Python, R, MATLAB, or similar).
- Demonstrated publication record in peer-reviewed journals.
- Ability to work in an interdisciplinary team.

Desirable Skills

- Experience with socio-ecological systems modelling.
- Experience with satellite imagery analysis and/or machine learning methods.
- Familiarity with environmental monitoring technologies.

The successful candidate will join a collaborative research team spanning multiple institutions in KwaZulu-Natal and contribute to the development of an integrated modelling framework to inform sustainable resource management and policymaking in the context of global environmental change.

Applications should include a CV, a brief research statement, and contact details of two referees. Enquiries and Applications to be sent to Prof Kevin Duffy, Research Professor of Mathematics, email: DuffyK@ukzn.ac.za

The closing date for receipt of applications is 04 March 2026.