**Business Unit: Water & Catchment Protection
Reporting to: Regional Supply & Flood Modelling Manager**

## Position Purpose

To develop and implement contemporary probabilistic hydro-climate modelling framework of extreme storms and their hydrologic impact on important declared dams including considerations for climate change, required to support Hydrologic Risk Assessments of rural NSW dams as a part of the broader Portfolio Risk Assessment Program of WaterNSW, and put safety first.

## Key Accountabilities

1. **Safety:** ensure all activities are undertaken with the safety of our people as the number one priority and always role model safe behaviour.
2. **Values:** behave and make decisions in accordance with the WaterNSW Values at all times.
3. Design, develop and implement new risk based contemporary models of hydroclimate extremes, tools and products required for regional supply and flood modelling services, especially those relevant to hydrologic risk assessments of all rural declared NSW dams.
4. Implement a systematic approach using best practice methods to consider storm magnitude and distribution, basin, and flood data to estimate precipitation depths and resulting floods of very low probabilities up to Probable Maximum Flood (PMF) for rural declared dams in NSW where estimates are relevant to the notional upper limit in a risk-based hydroclimate modelling framework.
5. Collate and develop quality assured catchments’ specific hydroclimate and hydrological data for all rural NSW valleys for further use in hydrologic modelling.
6. Develop baseline hydroclimate and hydrological models for all rural NSW dams together with downstream tributaries susceptible to coincident flooding in the respective river basins.
7. Perform frequency analysis of hydroclimate extremes at priority locations and scenario modelling of extreme floods to support Portfolio Risk Assessment of all rural declared NSW dams.
8. Update and maintain the existing models, modelling tools and products used for wide ranging applications in regional NSW.
9. Provide support to Water Modelling Systems specialists for designing, developing, and maintaining complex scientific applications.
10. Work collaboratively with external Research Partners of WaterNSW, and internal Information Technology Partners to transition state-of-the-art research models into fit-for-purpose operational modelling systems.
11. Ensure that policies, principles, and practices in relation to all elements of WaterNSW are applied in the work area.

## Key Challenges

* A subject matter expert in hydroclimate modelling and back-end scientific programming who embraces new ways of working across multidisciplinary teams.
* Establishes credibility with experts from different domains and a strong ability to successfully deliver complex project outputs and outcomes against tight timelines.

## Significant Internal Relationships

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| --- | --- |
| Stakeholder | Purpose of Relationship |
| Regional Supply and Flood Modelling | * Proactively support establishing of modern practices required to perform computationally intensive modelling tasks in complex projects
* Collaborate with the team and subject matter experts working on priority projects, e.g., Hydrologic Risk Assessments for rural dams
* Collaboratively develop hydroclimate models, modelling tools and quality assured datasets for rural NSW dams
* Support deployment of valley specific hydroclimate models in the operational modelling environment
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| Business Systems and Information Team | * Support BSI team and modelling system specialist(s) for developing solution architecture of the Hydrologic Risk Assessment modelling system
* Contribute to development of modelling environment and software management systems
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| Dam Safety and Engineering Team | * Collaborate with the team
* Understand user needs, requirements, and business context
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| Water System Operations Team | * Collaborate with the team and support technical work required for Water Supply Systems Planning and Operations
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| Catchment Programs | * Collaborate with the team
* Understand user needs, requirements, and business context
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## Significant External Relationships

|  |  |
| --- | --- |
| Stakeholder | Purpose of Relationship |
| Research partners | * Proactively engage with research partners, especially those working on the development of new methods for hydrologic risk assessments for major water infrastructure
* Test, implement and evaluate research methods and modelling tools in WaterNSW IT infrastructure
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## Delegations, Financial Accountabilities & Freedom to Act

As defined in the WaterNSW Financial Delegations as varied from time to time.

## WaterNSW Leadership & Performance Competencies

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| --- | --- | --- |
| People | Level |  |
| Communicating with Influence | B | * Tailors communication to suit the audience and uses a range of influencing techniques to build support
* Supports messages with relevant examples, demonstrations and stories
* Communicates issues clearly with different audiences
* Handles challenging questions confidently and constructively
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| Driving performance | A | * Communicates clear expectations about what is required
* Conducts regular one on one meetings to provide regular feedback on work progress
* Is quick to initiate constructive conversations in relation to performance
* Actively listens to understand before responding
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| Managing Change | B | * Understands risks and opportunities of change and is able to take action to ensure the change is successful
* Understands the range of reactions to change and actively manages these
* Identifies and addresses stakeholder resistance to change
* Communicates key information and wider reasons for change
* Gains stakeholder support and generates enthusiasm about change
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| --- | --- | --- |
| Customer | Level |  |
| Collaboration & Engagement with Customers and Stakeholders | B | * Builds and maintains relationships with individuals from other work groups to accomplish shared goals
* Adapts approach to meet the needs of a broad range of customers and stakeholders
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|  |  |  |
| --- | --- | --- |
| Business | Level |  |
| Analysis & Problem Solving | B | * Defines the extent and cause of the problem through observation and investigation
* Knows when and how to source and use additional information to effectively diagnose the problem and determine suitable solutions.
* Considers all possible solutions and seeks input from subject matter experts where appropriate
* Takes necessary action to implement the identified solution
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## Mandatory Candidate Requirements

**Qualifications:**

* Relevant tertiary qualifications from an Australian educational institution in Hydrology, Atmospheric Science, Environmental Science, Computational Science or an equivalent/comparable overseas qualification.
* Current NSW Drivers Licence

**Knowledge:**

* Demonstrated professional competence and specialist knowledge in the following areas: advanced hydroclimate and/or hydrologic modelling, surface water, ensemble modelling, predictive uncertainty, and spatial modelling, preferably in water resources and/or natural resource management disciplines.
* Professional programming skills required for scientific computing using agile languages e.g., Python, R and/or MATLAB and in system languages e.g., C++ and FORTRAN.
* Knowledge of modelling tools within contemporary scientific software development and management framework.

**Experience:**

* Demonstrated experience in the investigation of hydrologic impacts of climate variability and change.
* Demonstrated expertise in developing and/or implementing complex scientific applications in water, earth system sciences or other domains directly informing management and planning in the water resources and related sectors.
* Demonstrated knowledge and skills in analysing and visualising multi-dimensional large datasets, preferably for scientific or engineering purposes. Experience with scientific data formats e.g., NetCDF, and/or other geospatial data.
* Demonstrated experience in ARC GIS and handling of vector and raster data for scientific applications.
* Experience working in a multi-disciplinary team to meet deadlines and respond productively to changing requirements, and the ability to work independently to define and carry-out specific work goals.
* Excellent skills in oral and written communication including a demonstrated ability to effectively explain complex scientific and modelling issues to colleagues and research/industrial partners.
* Proven ability to work within a team and collaborate effectively with all internal and external stakeholders, colleagues, and clients.

## Favourable Candidate Requirements

* Knowledge and/or experience in stochastic space-time modelling and treatment of uncertainty in scientific applications.
* Knowledge and experience in the use of time series data sets for modelling, such as SCADA, HYDSTRA and real-time online data in water and environment sectors.
* Post graduate qualifications and experience directly relevant to the role and responsibilities of the position.

## Pre-Employment Checks Required

* Identification
* Qualifications
* Drivers Licence
* Referee checks
* Pre-employment Medical (Office based work)
* Police Check