CONTAMINANT GENERATION:

Generates loads and concentrations of contaminants entering streams or groundwater over time as a function of climate, soils, land use, and land management.

GROUNDWATER QUALITY AND QUANTITY:

Determines groundwater levels and quality, subsurface flow pathways, and discharge to streams. Quantity model could be used alone if only flows are of interest.

MAINSTEM WATER QUALITY:

Predicts water quality in the river mainstem given contaminant inputs. Used in conjunction with flow routing.

RESERVOIR WATER QUALITY:

Estimates water quality in reservoirs given the inflows and flow rates and climate. Used in conjunction with reservoir hydrodynamic models. Can account for stratification and longitudinal variation of water quality.

WATER AVAILABILITY AND ALLOCATION:

Combines rainfall-runoff models, water demand models, water allocation, reservoir operation and abstraction rules to determine water availability and reliability over time and through a catchment. Some forms optimise water use allocations.

Model components, timing and costs

There were 13 model components initially identified throughout the consultation process with potential partners and stakeholders, which have been prioritised through workshops and documented in reports (scoping report, prioritisation background, prioritisation results and work plan). These highest-priority components along with associated uses, preliminary estimated costs and timeframes are outlined below:

Model components	Potential uses	Timeframe and costs	Taura attributes addressed
CONTAMINANT GENERATION	· Regional plans · Limit setting · Assessing benefits of rehabilitation · Assessment of large consents	**2 – 5 years** **Cost:** Modelling, including application, training, development $500k. New data acquisition $300k	Kai, Water quality, Experience, Ecological integrity
GROUNDWATER QUALITY AND QUANTITY	· Regional plans · Assessment of large consents · Assessing impacts of nitrogen loss mitigation, including spatial aspects · Improving water resources models, especially low flow prediction	**2 – 5 years** **Cost:** Modelling, including application, training, development $250k	Kai, Water quality, Experience, Ecological integrity, Water security
MAINSTEM WATER QUALITY	· Understanding how inputs of nutrients and microbes, and associated mitigation, affect mainstem river quality · Understanding how flow abstractions affect water quality · Understanding how imported water affects water quality · Understanding the risks of algal blooms · Can reservoir operation be modified to reduce risks of blooms?	**2 – 5 years** **Cost:** Modelling, including application, training, development $350k **Cost:** New data acquisition $300k	Water quality, Experience, Ecological integrity, Water security
RESERVOIR WATER QUALITY:	· River rehabilitation · Limit setting (quality and flow) · Refining reservoir operation regimes · Large consents · Forecasting water quality (with an additional forecasting model)	**2 – 5 years** **Cost:** Modelling, including application, training, development (preliminary estimate) $300k **Cost:** New data acquisition (preliminary estimate) $400k	Water quality, Experience, Ecological integrity, Water security
WATER AVAILABILITY AND ALLOCATION	· Development of water management options, including participatory approaches · Regional plan and rule development · Basis for assessing large-scale consents	**2 – 4 years** **Cost:** Modelling, including application, training, development $350k	Water security, Water quality