SECLI FIRM

The Added Value of Seasonal Climate Forecasting for Integrated Risk Management

Promoting the integration of seasonal climate forecasts in the water sector to help mitigate stress events in the supply – demand balance

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ENEA Italian national agency for new technologies, energy and sustainable economic development
Met Office
UL AWS TRUEPOWER
WEMC World Energy & Meteorology Council
eurac research
alperia

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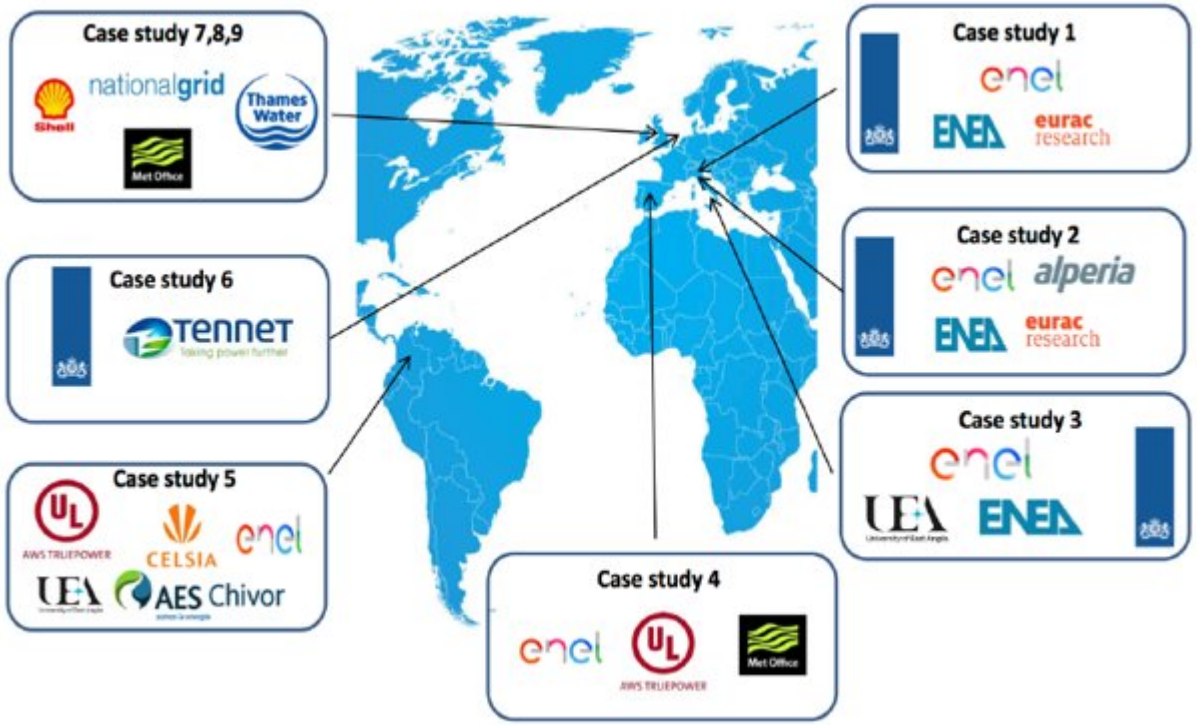
The central objective of SECLI-FIRM is to demonstrate how the use of improved climate forecasts, out to several months ahead, can add practical and economic value to decision-making processes and outcome.



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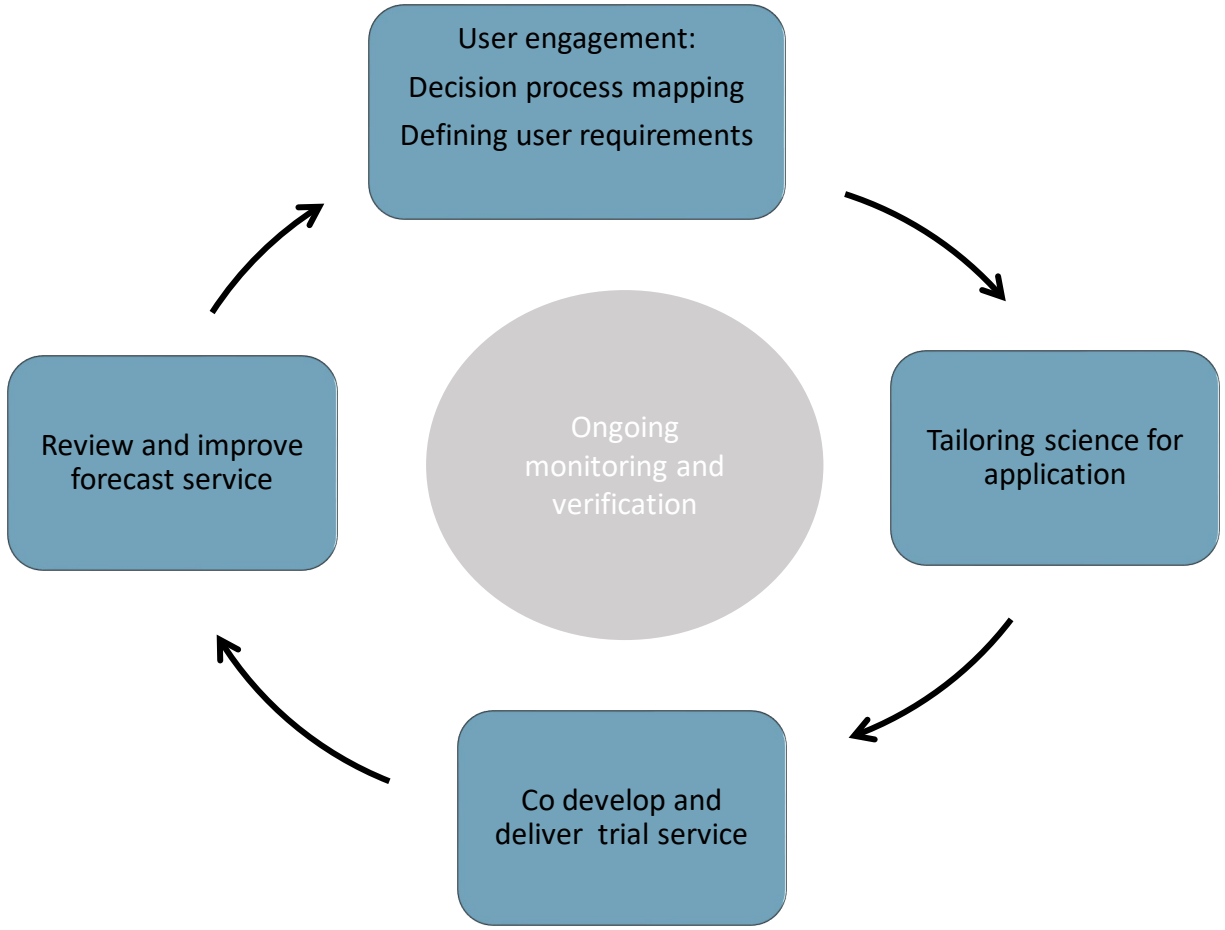
The approach



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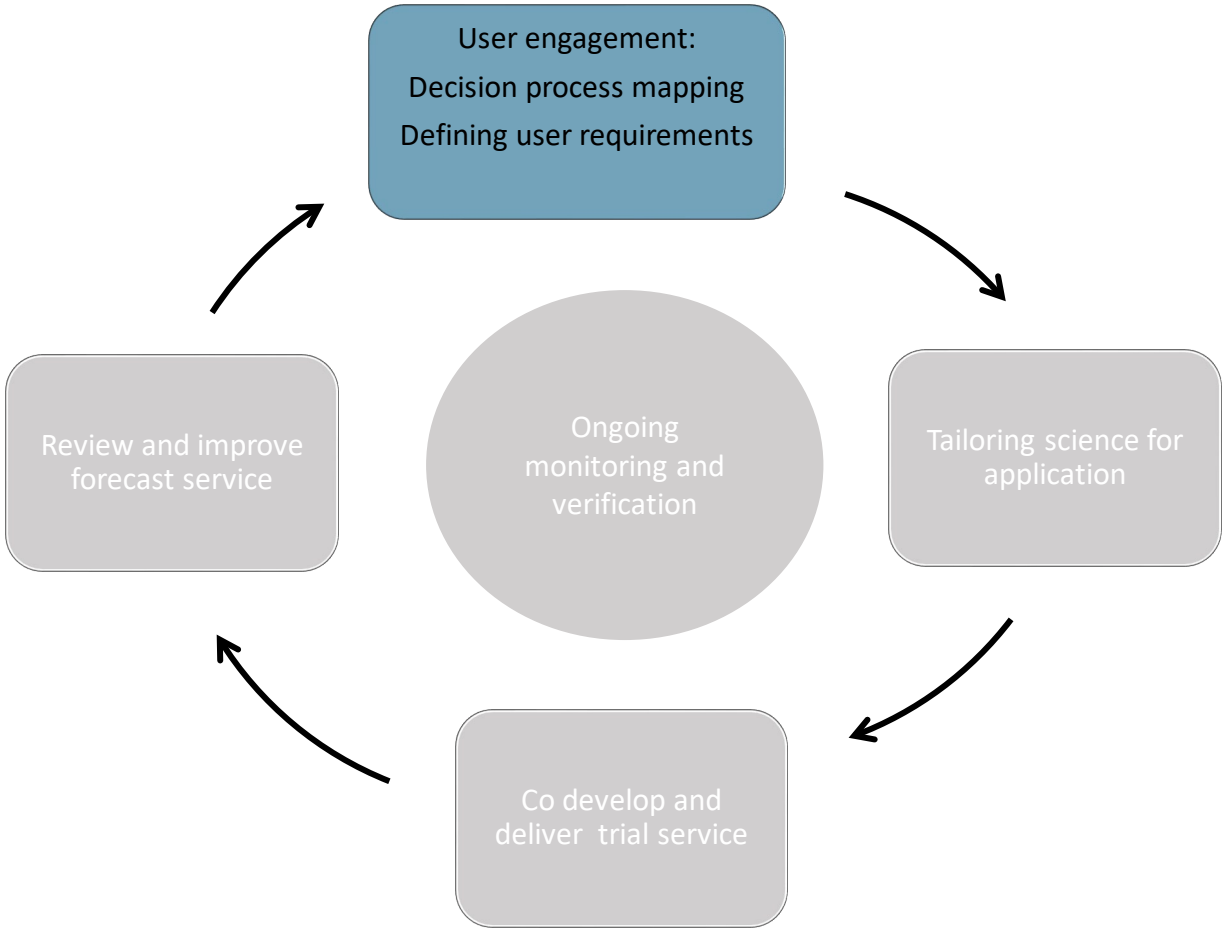

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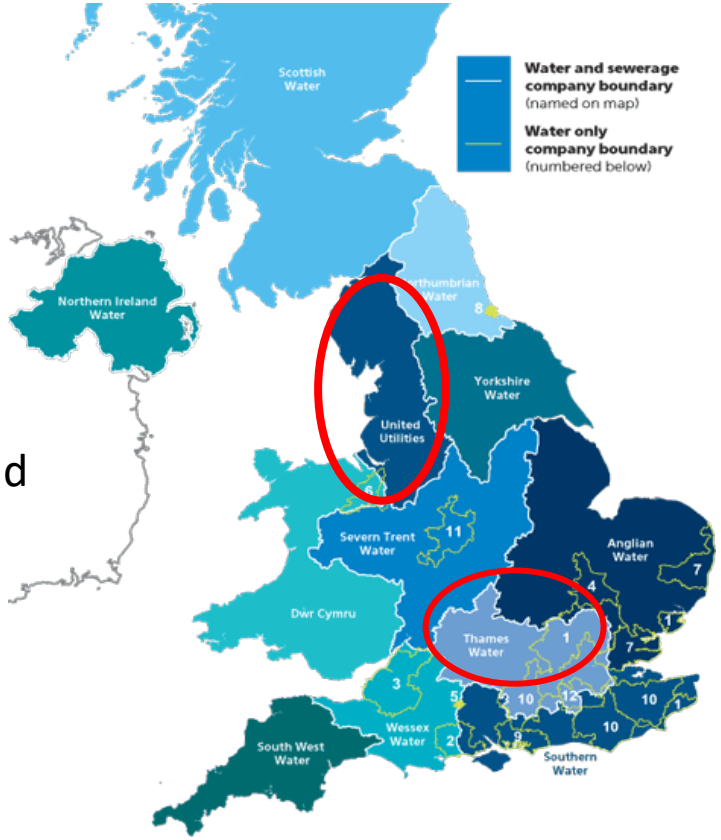
Workshops

- Capture decision process – Baseline from which objective improvements in management of the supply demand balance can be drawn.

- Identify case studies- Summer fluctuations in demand e.g. June/July 2017 and winter peaks e.g. March 2018



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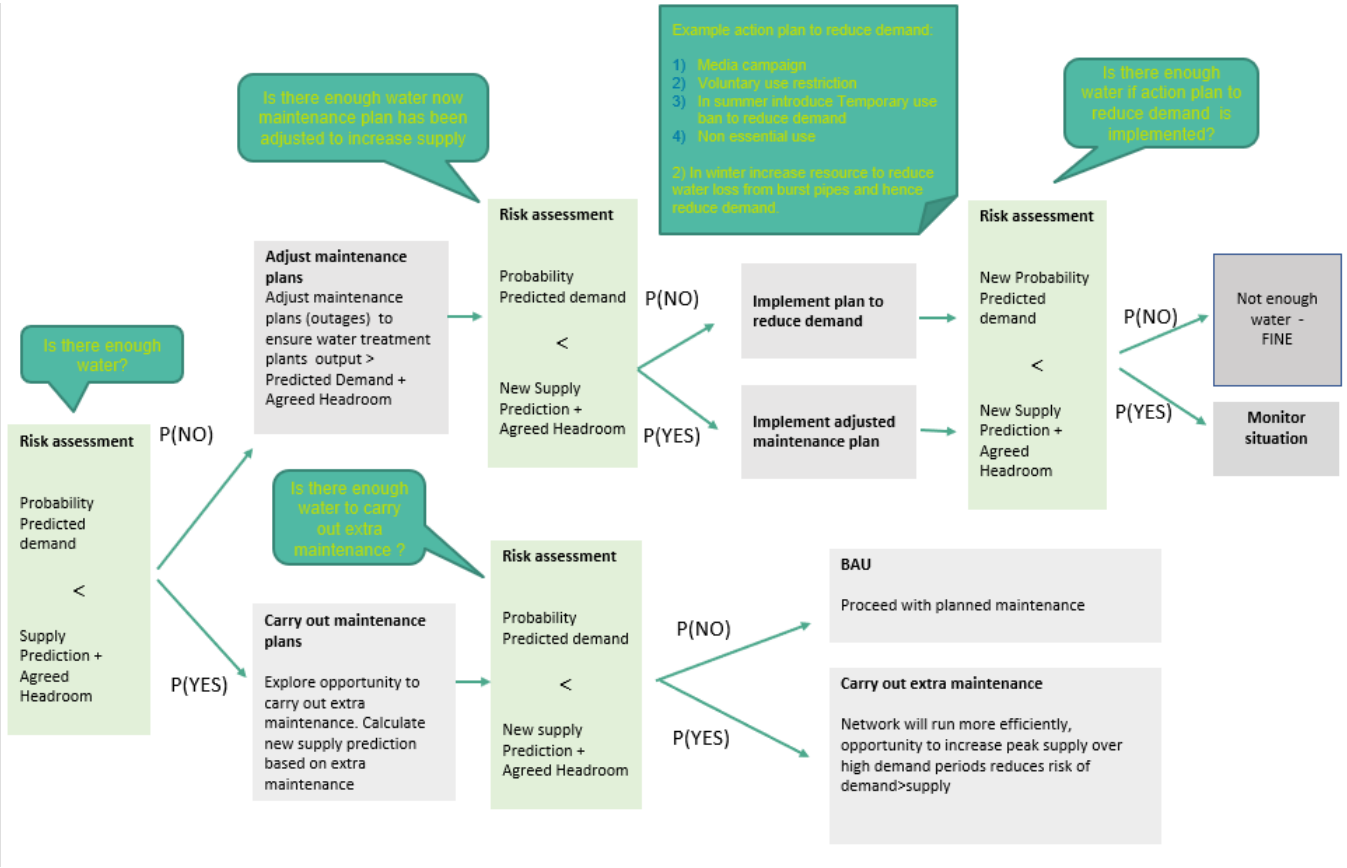
Decision tree



Identify important operational supply – demand balance decisions that can be improved on a seasonal time frame:

- Asset maintenance
  (Managing water treatment maintenance plans to ensure water treatment plants are able to operate at full capacity when required and to minimise expenses from last minute cancellations)
- Asset management e.g. resource management and optimisation of water treatment works

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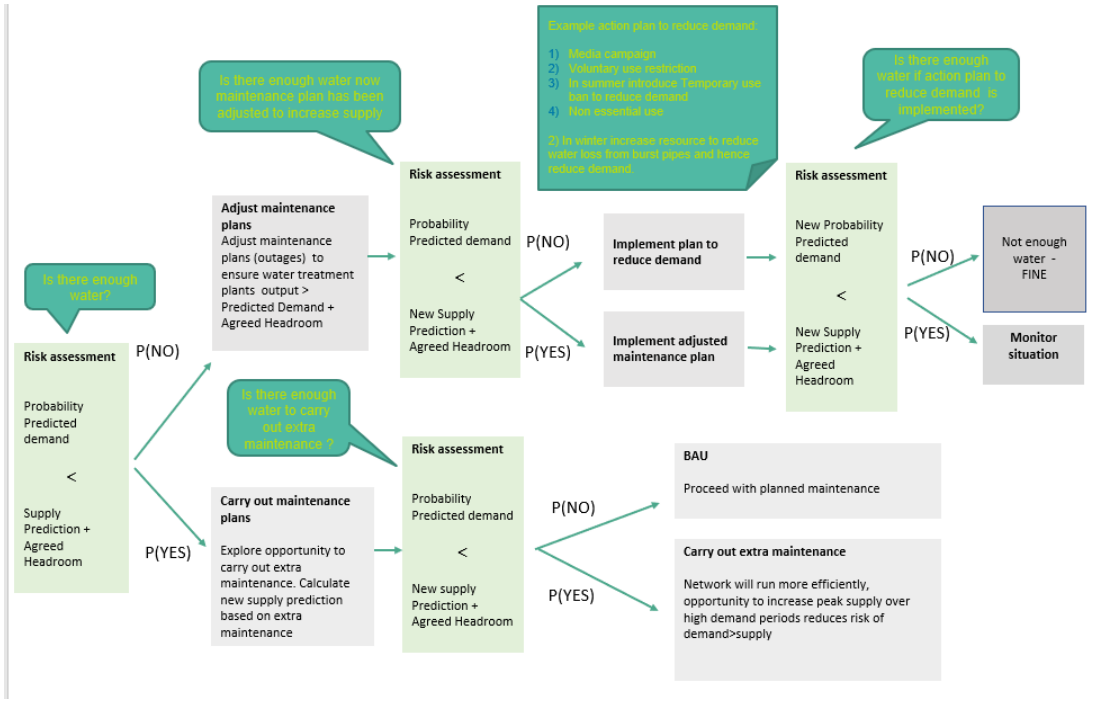
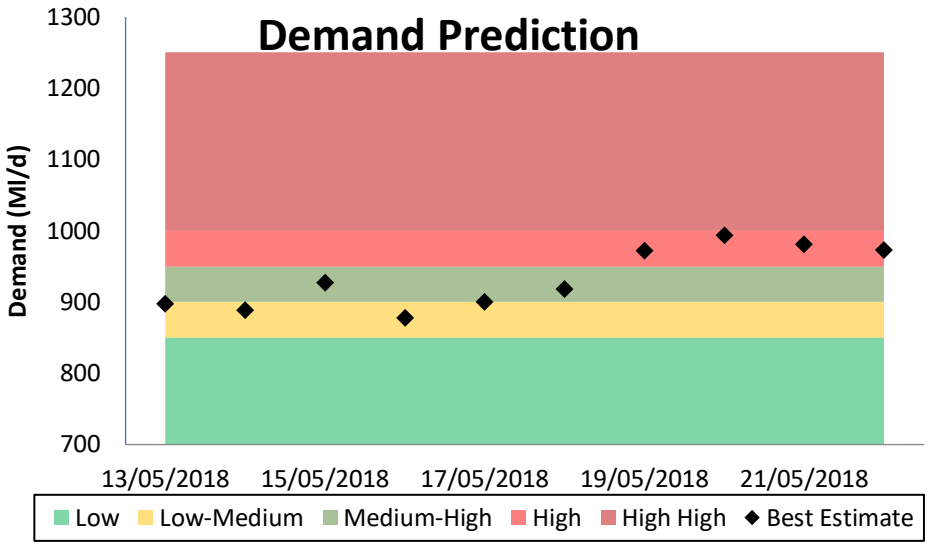
Identify how climate services can be integrated into the decision process





- Extend demand forecast
- Incorporate Uncertainty

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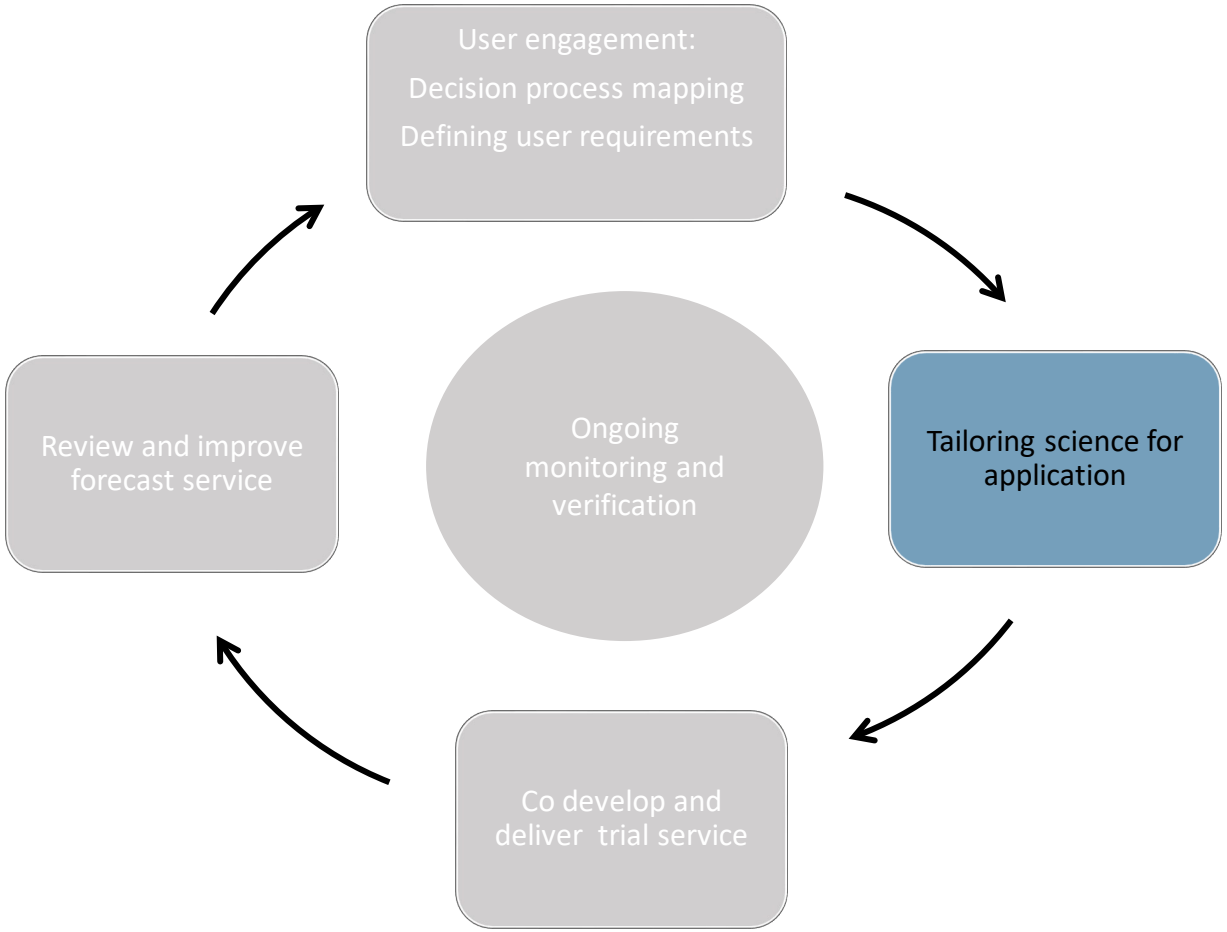

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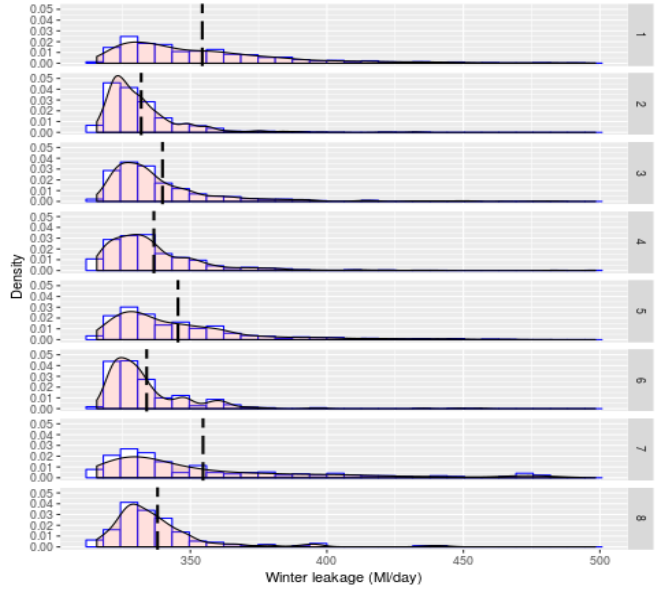
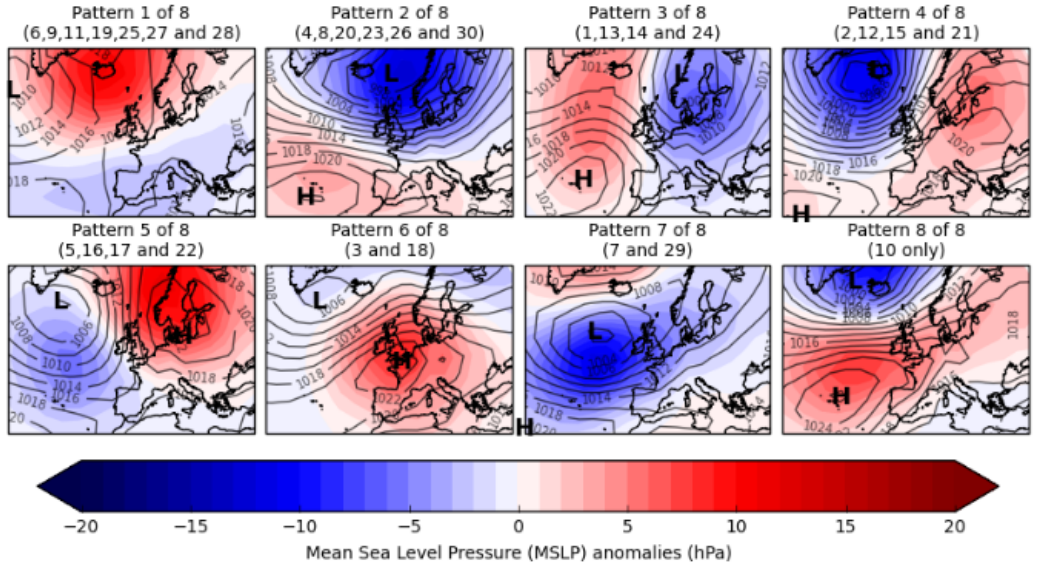
Tailoring data – Understanding the relationship between broad scale circulation patterns and demand





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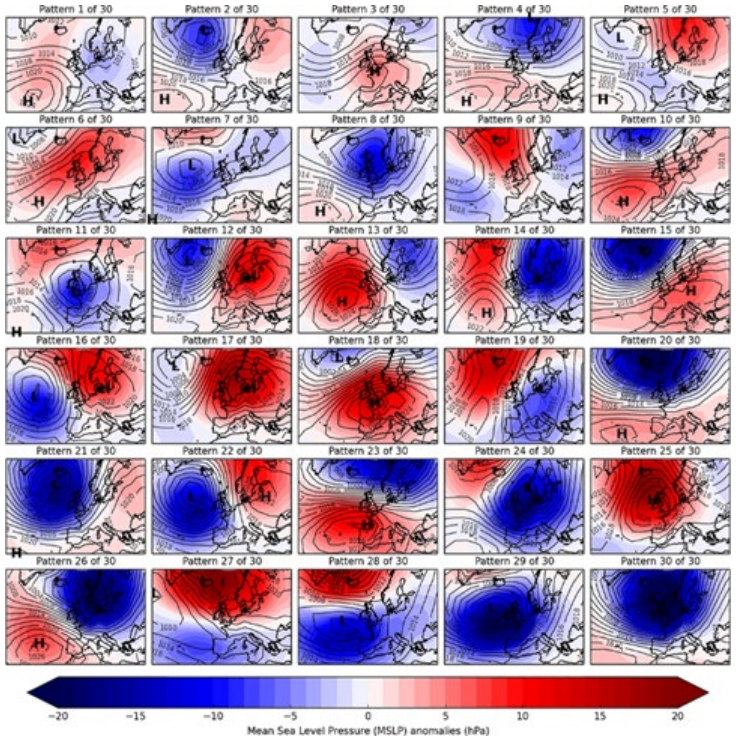
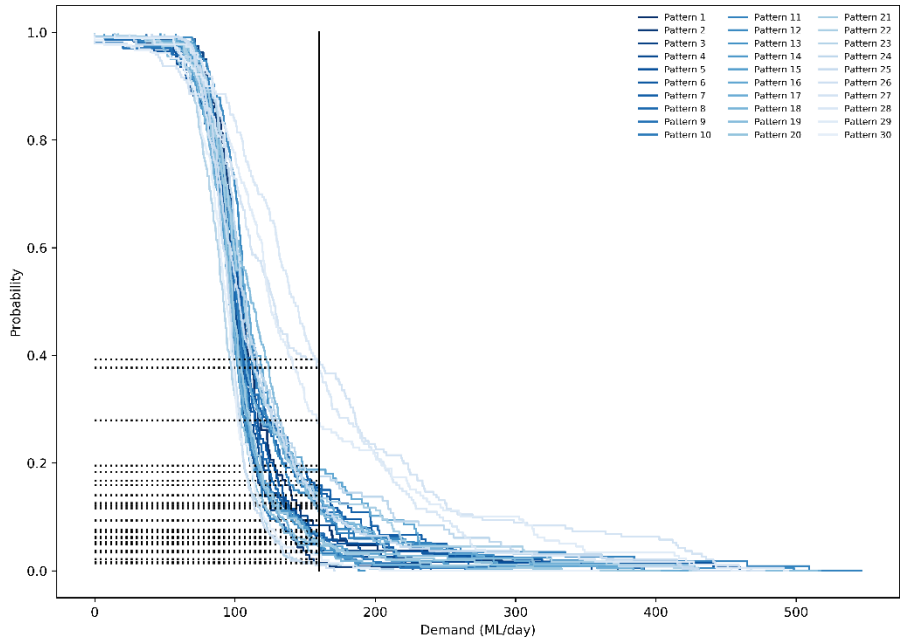
Applying relationship between broad scale circulation pattern and demand



$$\mathrm{P}(D_s < \delta) = \sum_{i=1}^{30} \mathrm{P}(D_s < \delta \mid Wi)\,.\,\mathrm{P}(Wi)$$



Ensemble forecast (MSLP)

Weather pattern forecast

Downscaling using 101 – day demand climatology centered on each day

Probability of exceedance of predicted demand level

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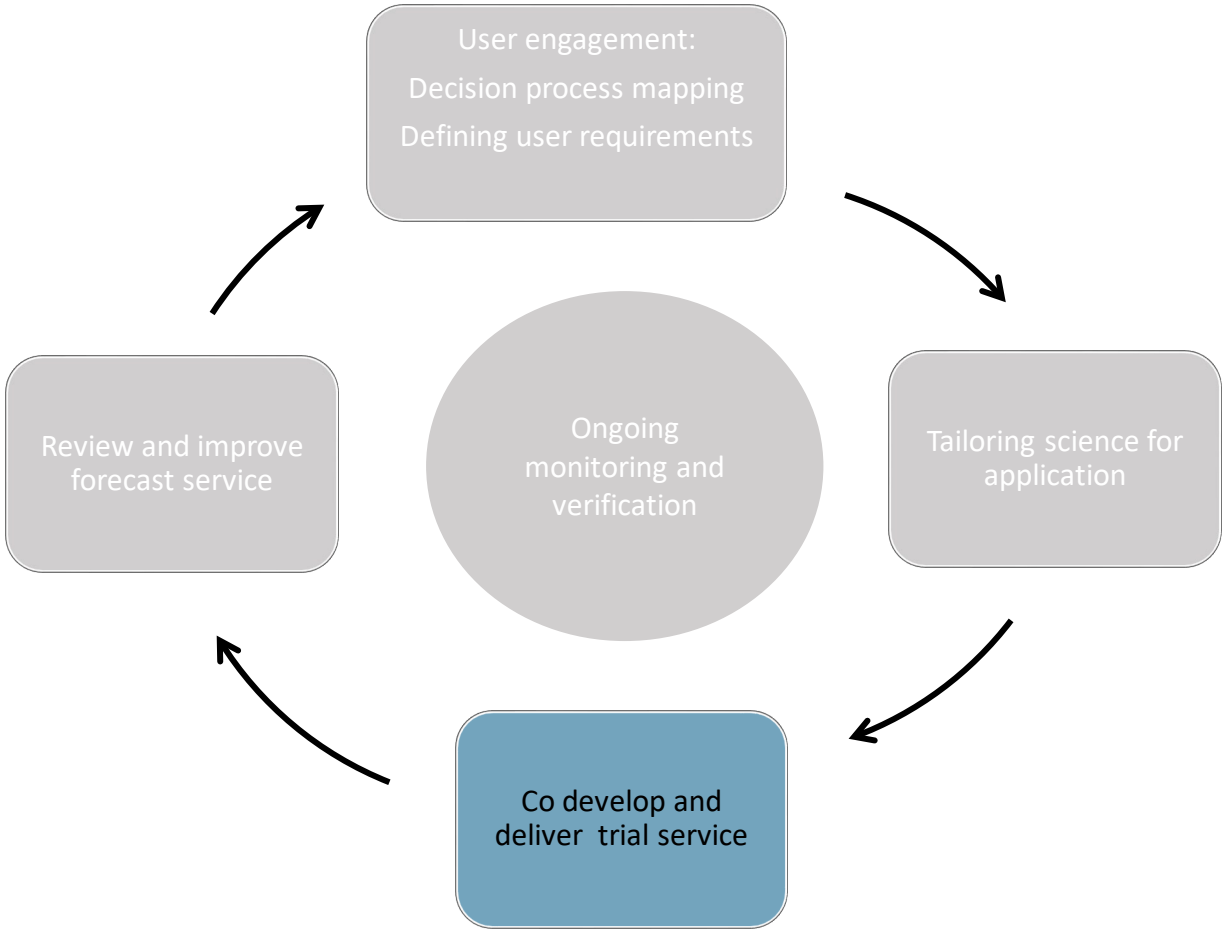

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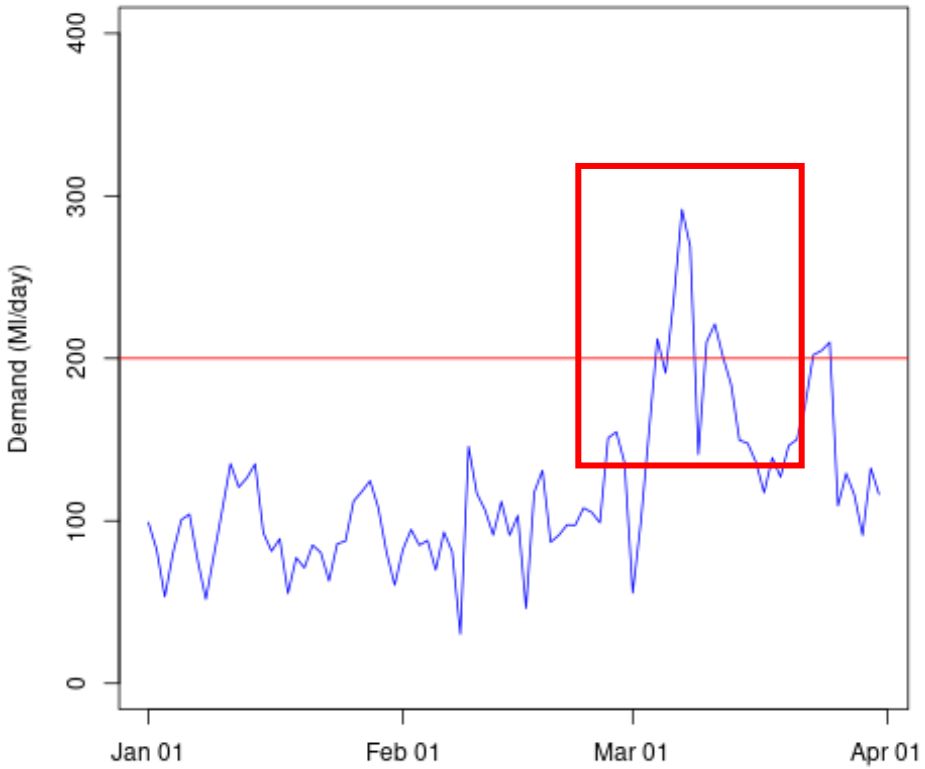
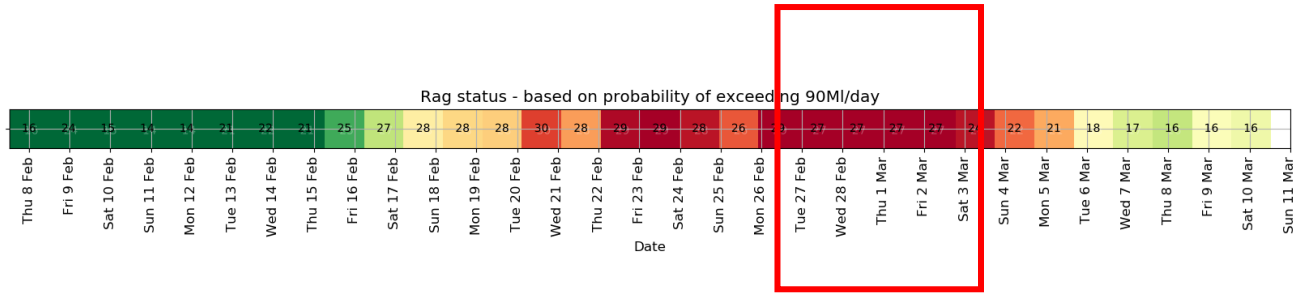
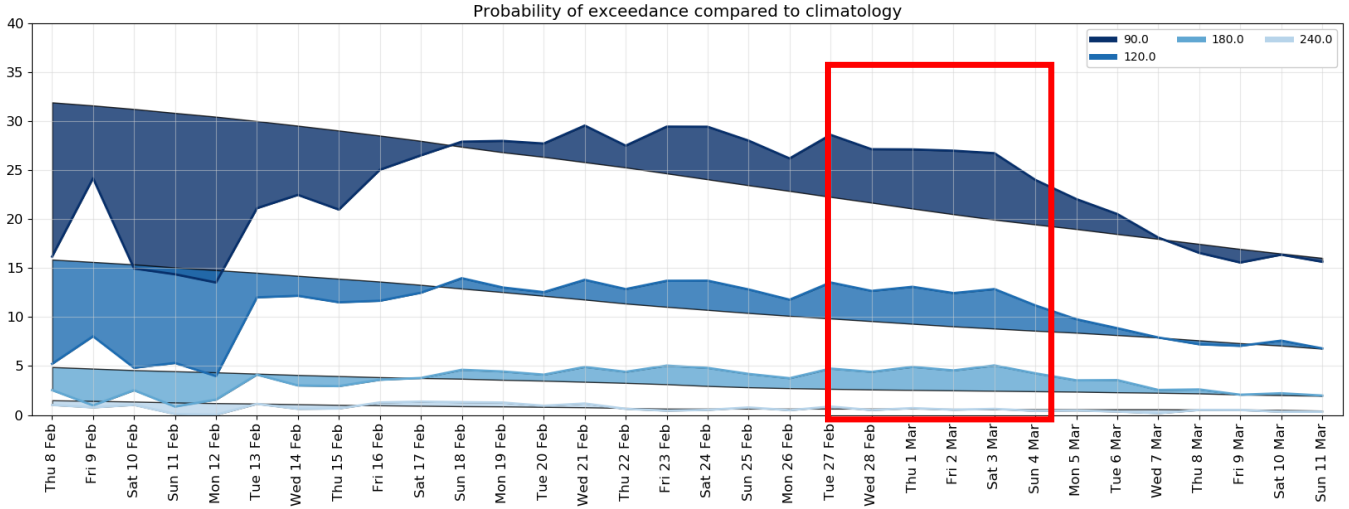
Trial forecast service







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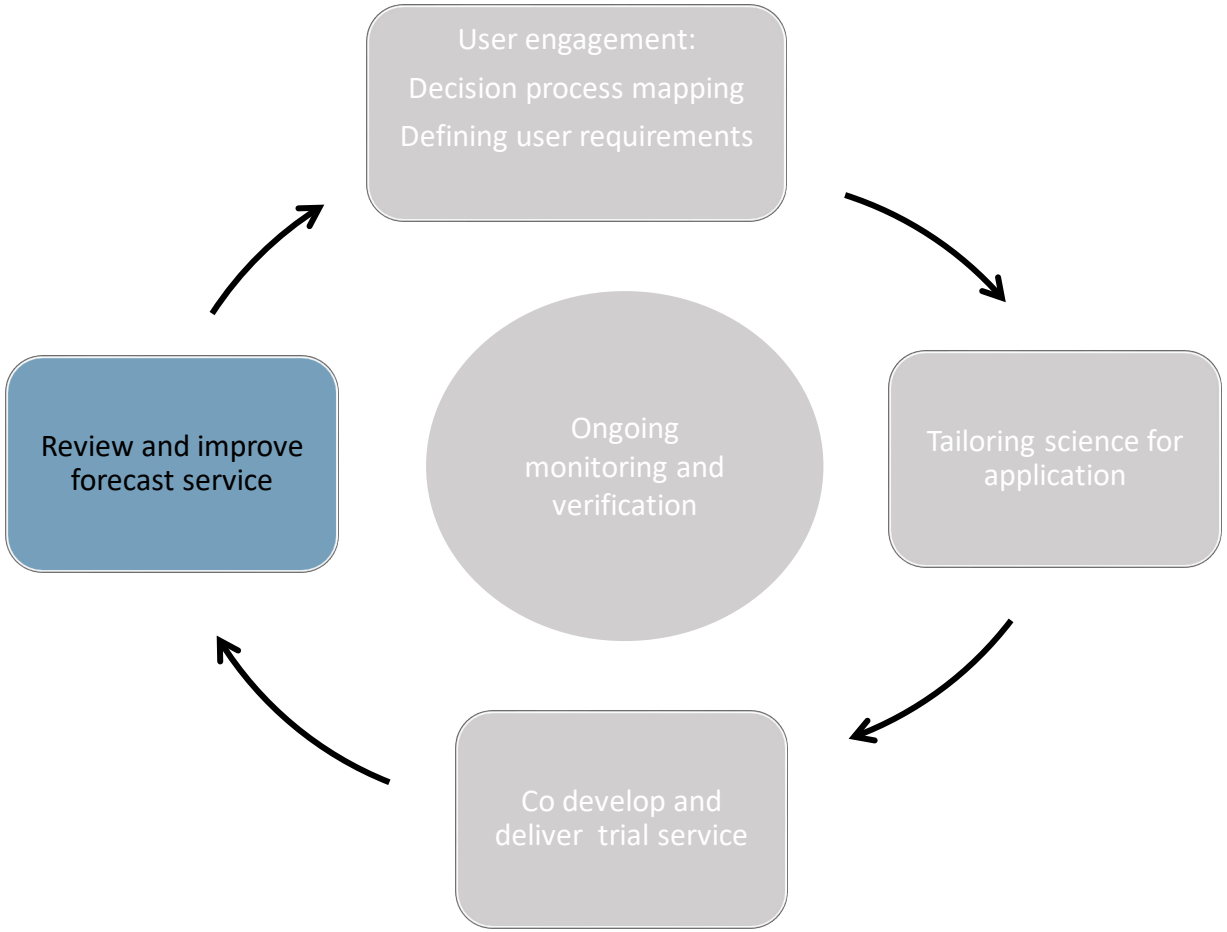

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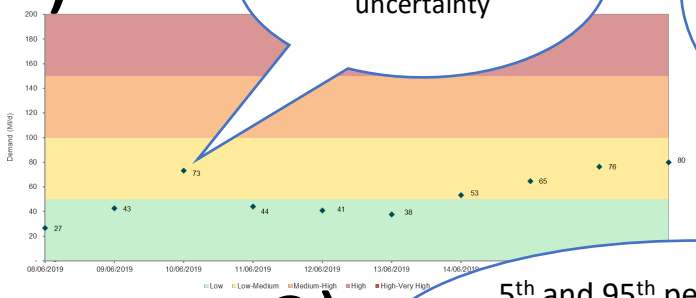
Example iterative steps of developing visualisation tools

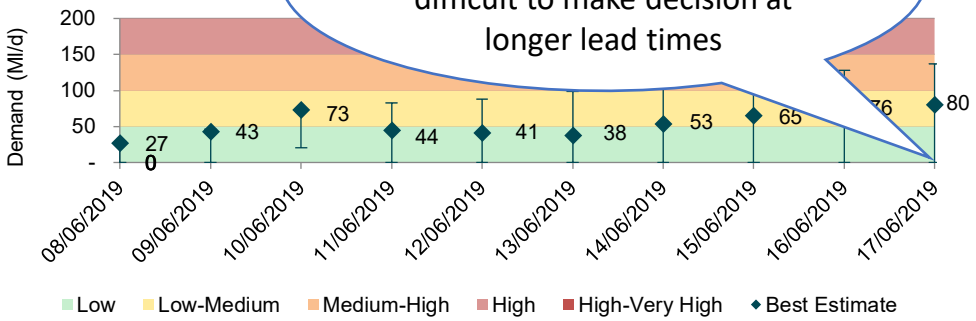
1)

Deterministic - No understanding of uncertainty



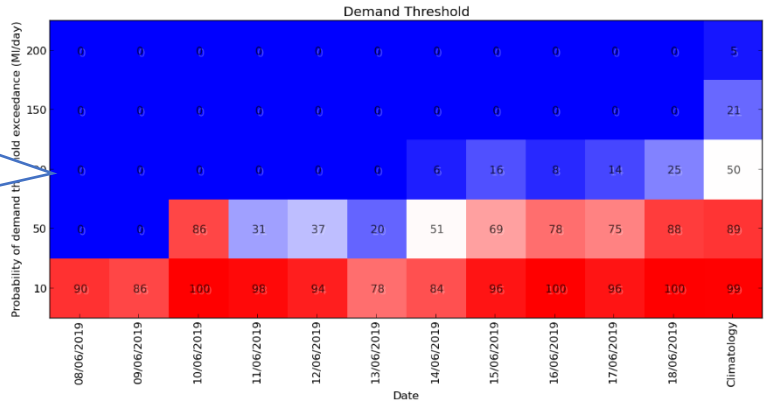
2)

5th and 95th percentile –wide uncertainty bands make it difficult to make decision at longer lead times

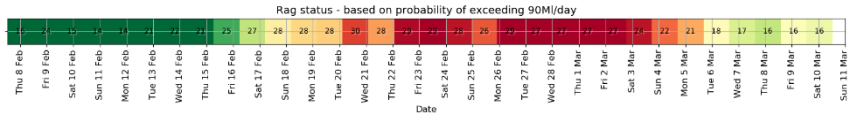


Threshold approach - turns probabilistic information into binary decision dependent on risk adversity
Still need to decide risk adversity i.e what probability to make decision?

3)



RAG status turn propb abilitisitc information in to warning system for



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Next steps

- Evaluation of the economic benefits
- Communication of the service to the wider water sector
- Developing the service to become fully operational

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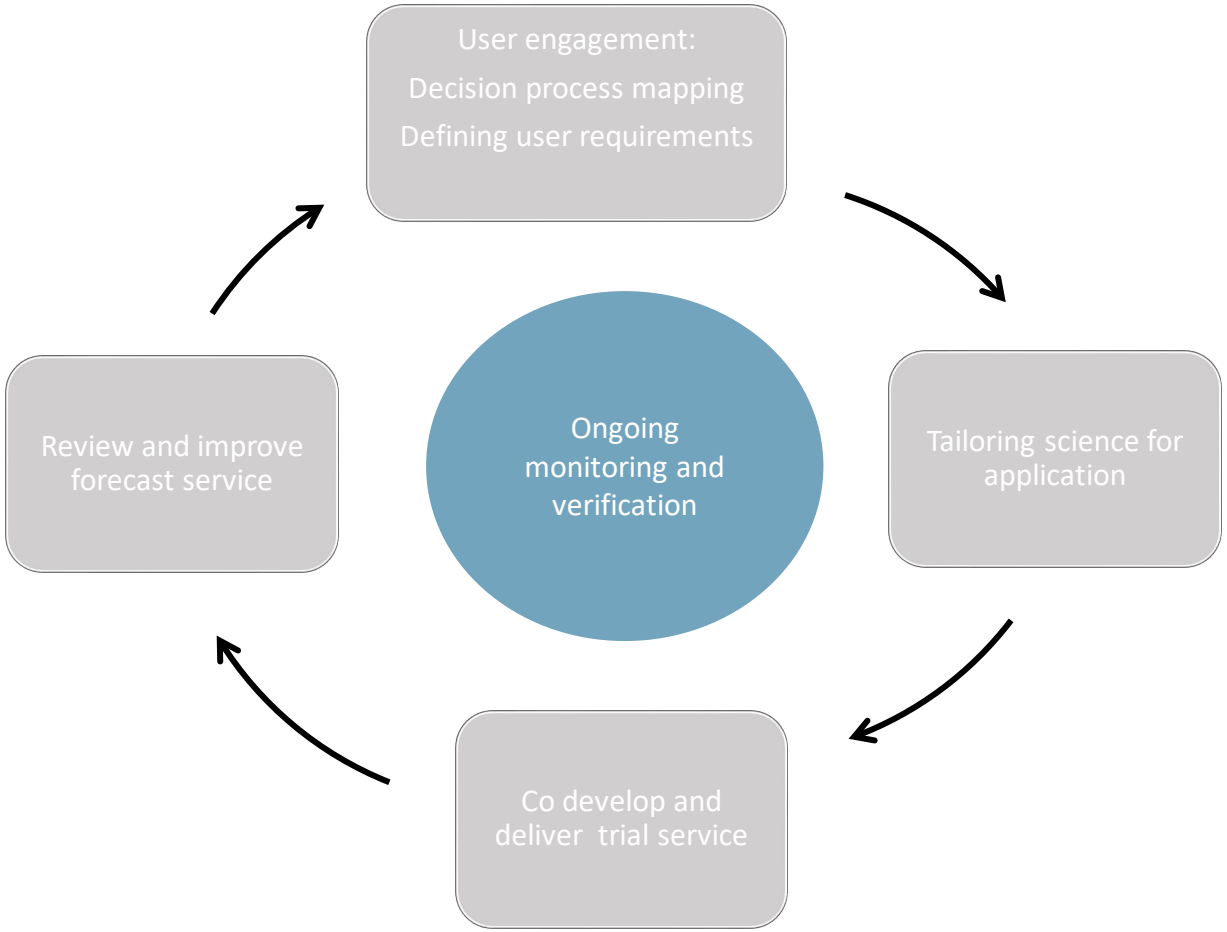

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