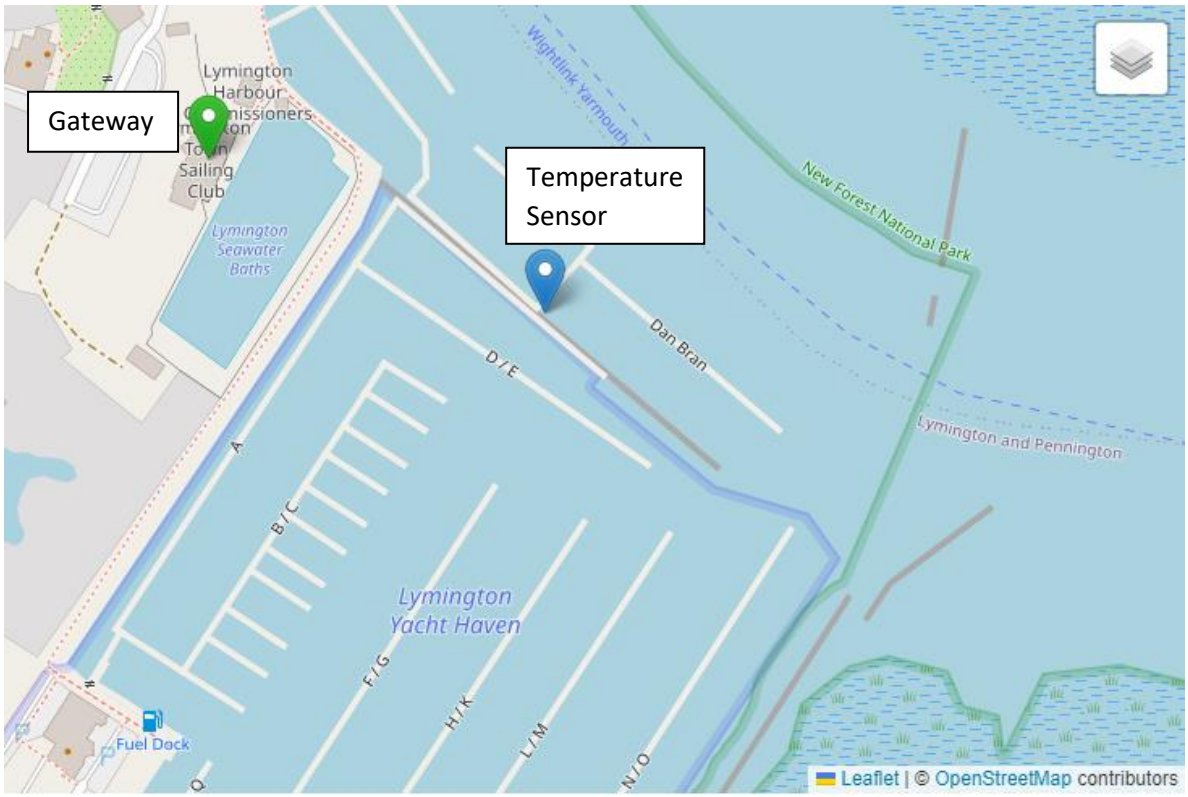
Case Study - Lymington River Temperature

Measurements taken with a rpr-IoT-T01 node at the Dan Bran Pontoon.

Testing the rpr-IoT-T01 temperature node.

As part of the testing program for the rpr-IoT range of instruments the temperature of Lymington River was monitored for over a year. The map shows the location of the temperature sensor and the LoRaWAN gateway. The gateway is indoors and the temperature node 171m away, mounted outside on the Dan Bran Pontoon.

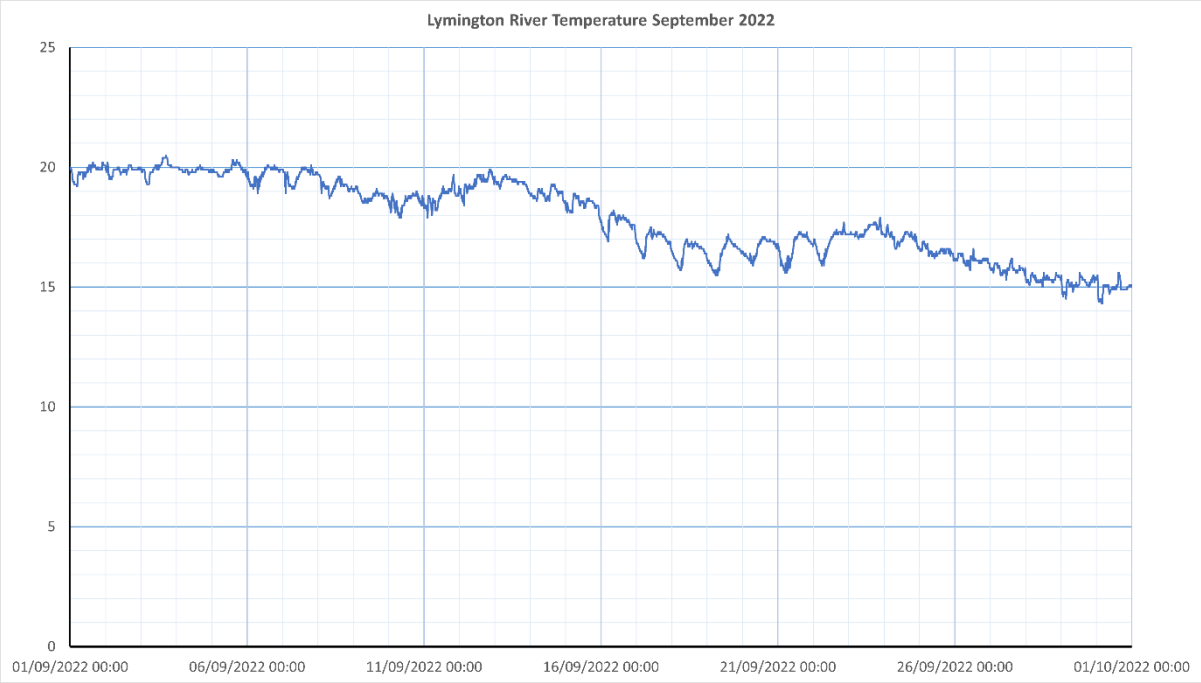


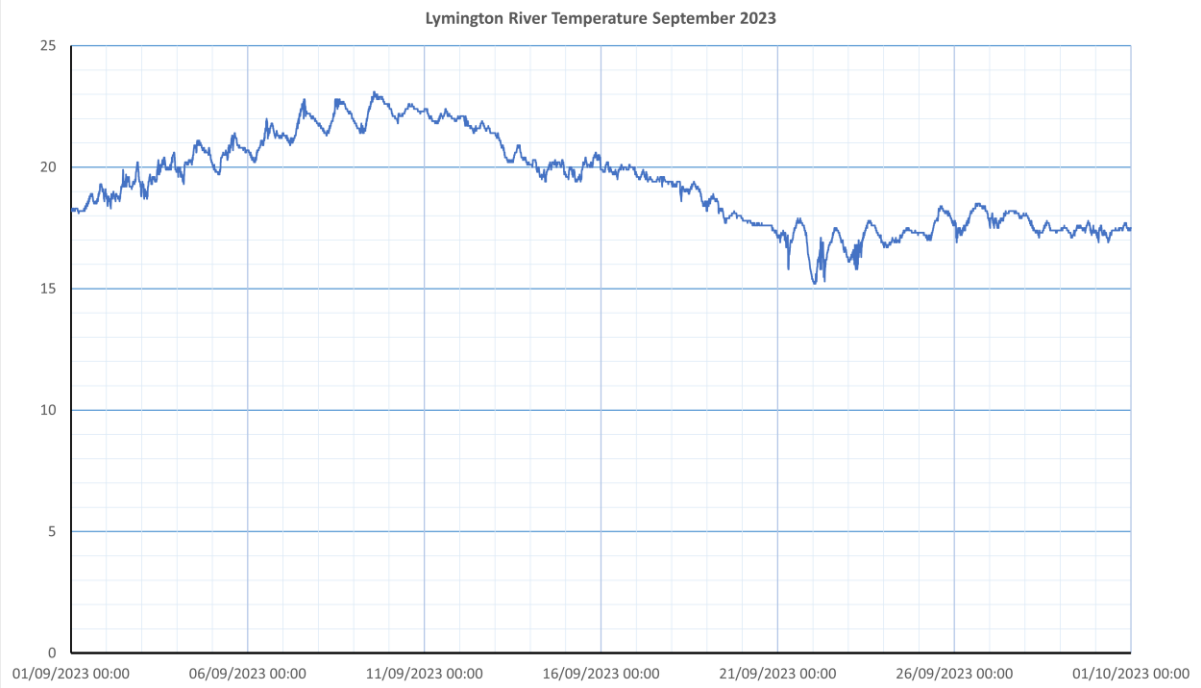
The node uses an adaptive data rate mechanism (ADR) to control the radio transmission spreading factor between a value of 7 and 12. A lower spreading factor requires less airtime and therefore less power to send a given message. In this application the node was able to use a spreading factor of 7 and send readings every 5 minutes. The node was left unattended for the duration of the test and did not require a battery replacement.

The operation of the node was able to be monitored using the rpr-IoT dashboard. This not only displayed the river temperature but also useful system information like; battery state, the gateway being used, spreading factor, received signal strength and signal to noise ratio. Data could be downloaded from the dashboard for further analysis.

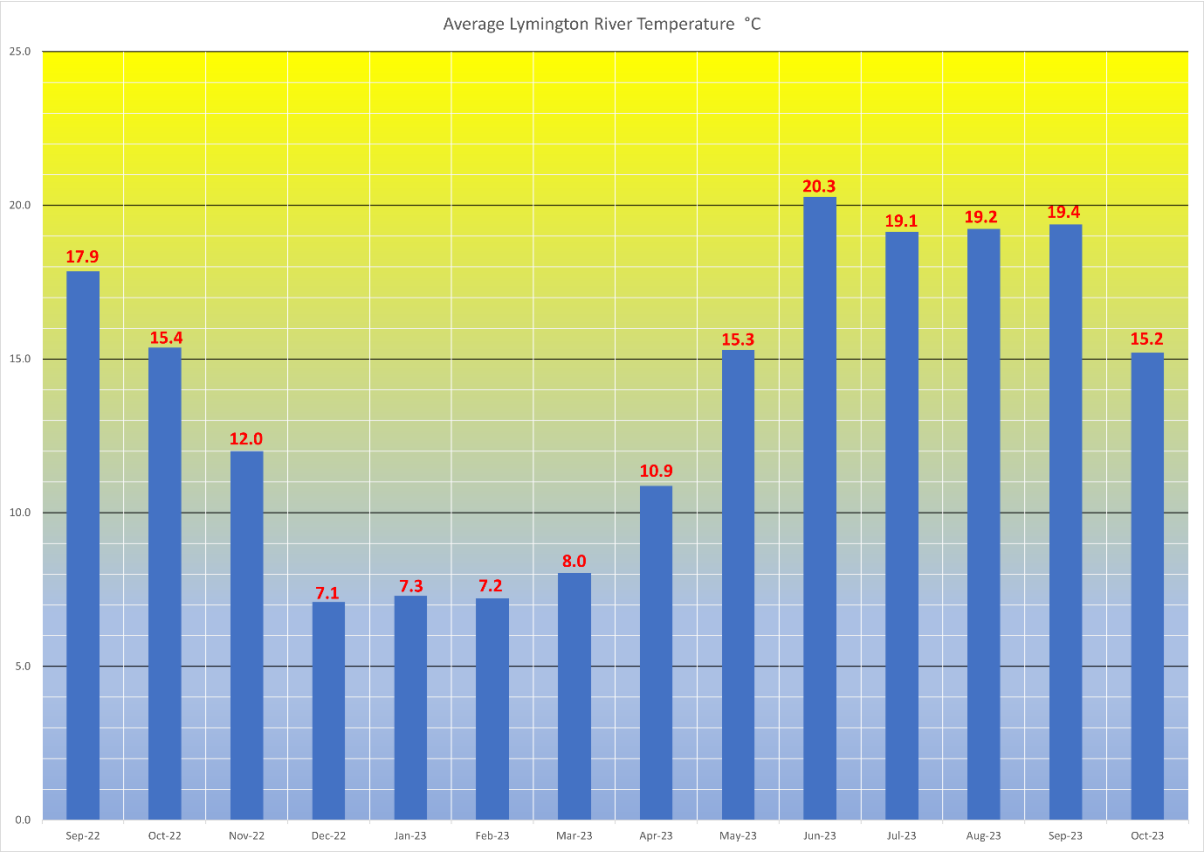
Plots

As an example of the data recorded following are plots of the river temperature in September 2022 and 2023





Plot showing the average monthly river water temperatures.



Conclusion

Once installed the temperature node was left unattended for the duration of the test and did not require a battery replacement. This was a successful long-term test of the temperature node and probe in a harsh outdoor environment and indicates the potential for LoRaWAN based instrumentation to be used in aquaculture and fish farming applications.

Photographs

Photograph of the rpr-IoT-T01 temperature node and probe attached to a GRP rod on the pontoon before deployment.

Photograph of the rpr-IoT-T01 temperature node fixed to the pontoon railings with probe extending down into the water.