Title: {riversynth}

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1. PROGRAM NOTES

{riversynth} is both an immersive performance and musical interface that mixes live hydrophone streams from six river systems with live processing through a gesturally controlled water instrument. Building on a decade of research from the River Listening project [1], *{riversynth}* creates an entangled performance ecosystem where unpredictable aquatic soundscapes become both the source material and score for a live performance.



Fig. 1. The RiverSynth.

2. PROJECT DESCRIPTION

The interface consists of a transparent tank filled with water and embedded sensors that detect water movement and light. These parameters modulate, filter and mix the live hydrophone streams via the performer's hands in the water, creating a dynamic relationship between the real-time river soundscapes and the performer's physical manipulation of water.

{riversynth} demonstrates multiple layers of entanglement: temporal (connecting historical River Listening research with real-time audio), spatial (linking geographically distant river ecosystems in a spatial performance environment), and material (using water to control and mix aquatic soundscapes). This multilayered approach directly engages with NIME 2025's theme by exploring

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how musical interfaces can bridge environmental monitoring with live artistic experimentation.

The technical implementation combines custom-designed sensors, a low-latency streaming network, and a granular synthesis performance tool for live manipulation of the hydrophone streams in surround sound. The interface enables intuitive control while maintaining complexity in the sonic output, allowing for both composed sections and improvisatory responses to the unpredictability of live streams.

{riversynth} creates an entangled network where environmental data becomes musical material, and human gestural control is mediated through live engagement with the hydrophones. This creates a feedback loop between performer, technology, and environment that emphasises our interconnected relationship with aquatic ecosystems and their health. While the performers appear to have agency through their gestural engagement with the water, it is ultimately the live river soundscapes that dictate and control how the performance will unfold, mirroring the unpredictability of the natural environment.

3. PERFORMANCE NOTES

This proposal is for a live performance with *{riversynth}*. The suggested duration is 10 minutes, but flexible: anything from 5 to 20 minutes. The *{riversynth}* itself is 1m x 0.5m wide, and would be best played on a table. A source of water is required to fill the synth for performance (and somewhere to dispose of the water afterwards). The interface utilises the optical focussing effects of water ripples on lights, so lighting is important. The *{riversynth}* crew will bring portable coloured parcans, that can be setup on the table with the synth, or alternatively house lights may be used instead, subject to some preparation and rehearsal time in the space.

A darkened space would be optimal, and ideally an overhead(ish) video camera capturing the synth (similar to the supplied demo video) would be projected onto a large projector screen. Depending on the venue, and the available equipment, the *{riversynth}* crew can bring a camera and projector if needed.

The overhead camera will feed into a laptop running that will video mix the overhead view with images of human intervention in the global river systems involved in the live streams.

{riversynth} is optimally configured as a multichannel work, for up to 8 speakers, but is flexible and can be performed in stereo. The {riversynth} crew will provide an audio interface and just need XLR inputs to the sound system.

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4. MEDIA LINK(S)

https://tobygifford.com/riversynth

5. ETHICAL STANDARDS

This research, and the broader River Listening project, are being conducted through the University of the Sunshine Coast's Creative Ecologies Research Cluster, which foregrounds ethical considerations. The centre adopts a model of research that operates on a notion of reciprocity "that disrupts traditional paradigms by emphasising care, collaboration, wellbeing, and ecological thinking over individual advancement." [2]. The live-streams that form the sound sources for this performance have arisen through community consultation and engagement with First Nations in a range of Biosphere reserves globally.

6. REFERENCES

- L. Barclay and T. Gifford, "Listening to Rivers: Engaging communities in freshwater conservation through real-time audio and locative media". In *Proceedings of the 29th International Symposium on Electronic Arts*, Brisbane, Australia, July 2024.
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