

MarNoise

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MERIDIAN

MERIDIAN Weekly Meeting - 2021-05-31

What is MarNoise?



- An in-development Python package for calculating certain underwater acoustic metrics (as per ISO 18405:2017)
- Alternative - not competitor - to other similar tools - e.g., MANTA
- Envisioned and jointly developed with MERIDIAN collaborator Jim Theriault
- Intended to be open source and simple to use



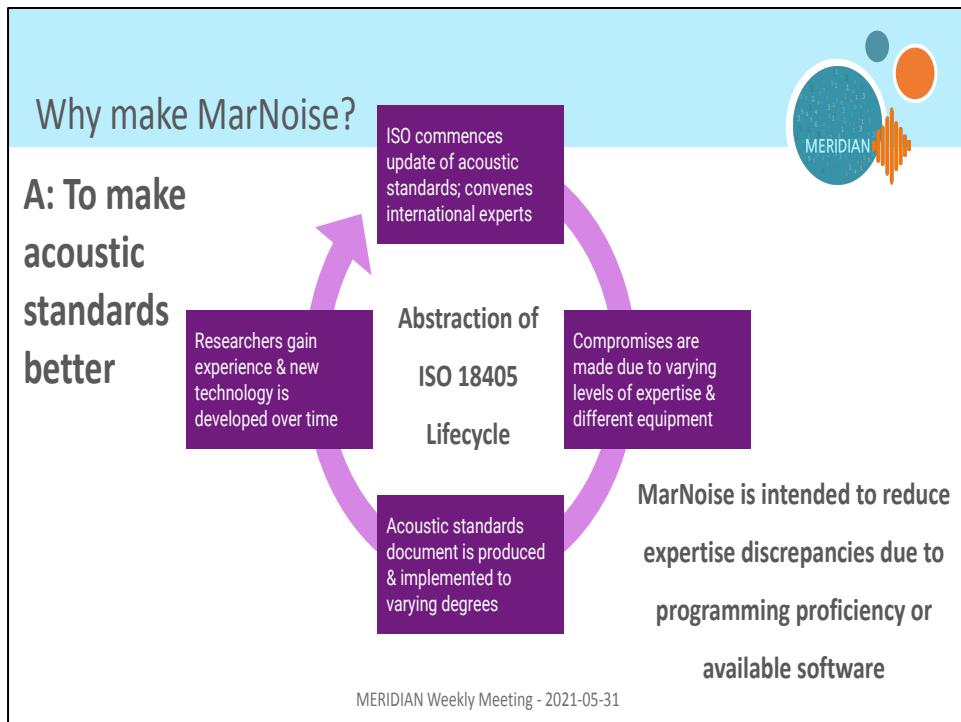
Also (nearly) the name of a historical style of French river boat - a modern reproduction is shown here, which was unfortunately sunk this April.

A marnois ship. From "«La Belle de Champagne», un bateau particulier est à quai à Mareuil-sur-Aÿ" by H. Nouaille and J. Bolomey, 2018, April 4, *L'Union*. Copyright 2018 by J. Bolomey

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ISO 18405:2017 is just a terminology list for underwater acoustics, but since so many terms are actually physical measurements, it also ends up being an invaluable reference for measurement techniques.

There are plenty of other tools that do similar things - MANTA just came out and is partly a Dalhousie Tool. But it's a MATLAB based tool - which changes its audience - and uses MATLAB code - which isn't open to the same degree as we might want

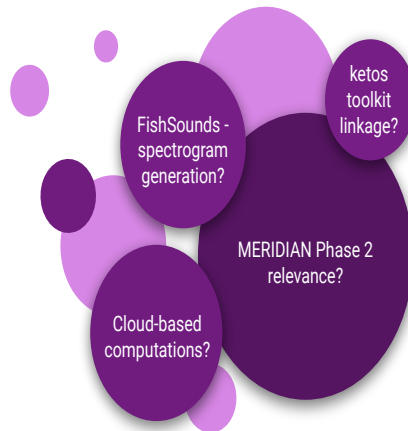


it depends on your perspective where MarNoise intersects with this lifecycle. The intent is that this software package will increase the baseline expertise of researchers. Obviously we can't eliminate all of them. It's like the difference between having a physics symposium where we're all in attendance, as compared to a physics symposium at, say, CERN. People will disagree and have different backgrounds and experience, but the foundation of the collective understanding/'public knowledge' is much sturdier and well developed at one as compared to the other.

What will MarNoise do?



- Perform calculations of multiple ISO 18405:2017 metrics
- GPU-assisted calculations (+ FPGA / hardware-deployable?)
- Cloud-deployable
- Cross-compatibility with other MERIDIAN software
- Spectrogram generation



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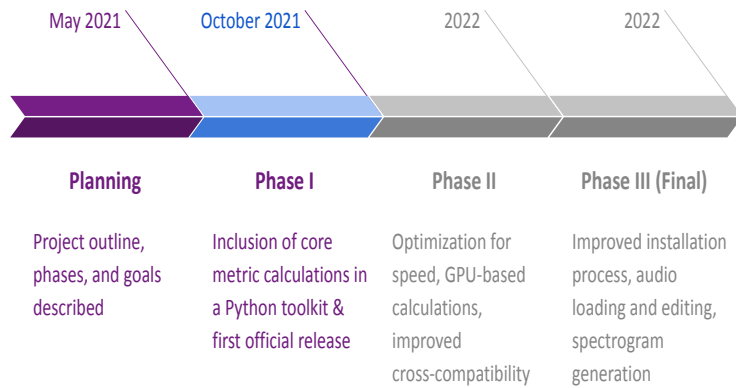
I'll show the metrics currently chosen on the last slide.

This more or less follows the timeline I will show on the next slide. "Get it working, get it working fast, make it great"

Spectrogram generation will appear late in MarNoise's development cycle, but I believe it might be relevant for certain current projects such as FishSounds. E.g., to specify that researchers produce and upload spectrograms using MarNoise - or, if the process is sufficiently cloud based, automatically compute spectrograms based on user uploads or input.

On the right - These are merely some ideas for what MarNoise could do - things that fit with its current purpose and my current knowledge of the software and these other techniques. They're likely to change.

Prospective MANTA timeline



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Obviously dates are tentative as are the actually included aspects in each phase, but this is how things appear from my current vantage point.

Phase II will likely also include a publication regarding the software, and may include an FPGA / hardware version - something that can be deployed directly onto hydrophones to produce intermediate results, make analysis faster on retrieval...

Currently included metrics



- SPL_{peak}
- SPL_{-peak}
- SEL_{24hrs}
- Hearing-loss weighted calculations
- Band weighted versions of the above metrics

ISO 18405 has many more metrics - which and how many ought be included?



Sound pressure level - peak; negative peak; sound exposure level, cumulative, 24 hrs;