Discovery of Sound in the Sea (DOSITS) Webinar
Regulation of Underwater Noise: An International Comparison
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Question and Answer Summary
(questions asked/answered in real time during the webinar or in the Q&A box)

Questions asked/answered live by Klaus Lucke during the webinar

In your summary, on the last slide there, you pointed out that vessel noise is not included in the regulations. Is anyone moving towards that or is it encompassed into the regulations in any of the ports or anything? I don't know if there's any movement towards that or how that's working right now if you if you have any idea about that.
Yeah, there is movement and I simply didn't have enough time to mention all of the initiatives out there. The International Maritime Organization, IMO, has launched an initiative to reduce vessel noise. And there is a lot of regulation, but I think it's more of a recommendation from 2014, but it hasn't resulted really in an action in the member countries yet. IMP is also a UN organization, and I don't know if they could, if they wanted to, impose any binding regulations. So, at this moment, it was actually I think even presented at the UN Headquarters in 2018 on an international level, and yet there is no real initiative. What I see is these initiatives that are presented - with the example the Eco program that is implemented in Canada, has drawn a lot of attention worldwide. Other ports think about implementing something similar, as part of their green initiatives. They have to become more sustainable, I guess. And this is a good way of actually doing this. And this Eco program has been a massive success in Canada, and I think the more ports that follow this example, the more successful and the more important, this will become. And if there's just one port that has these incentives, ship owners might not recognize that really as an incentive. But if there's many ports worldwide then, yes, that would have quite lot of weight, so to speak, gravitas, for people to consider, well, maybe we build a quitter ship next time. This is long process. It's nothing that's going to happen anytime soon. In Canada there's even the initiative, funded I think by the government, to build quieter ships. So the Canadian government is really at the forefront of this from what I can see. They are funding the development of quieting technology through governmental funding, and there may be other countries that I'm simply not aware of.

Moving onto wind farms. Now, you, you mentioned a number of the regulations in Europe that specifically target the building and operation of wind farms. Are those similar across the countries. Is there sort of a unified approach, and can people operating in the different countries take a similar approach to their windfarm building/operations?
What I see, at the moment, there is still a lot of difference between the national regulations. If you for example, look at German regulations and compare that to Danish regulations, some are

prescriptive, others are non-prescriptive…some used TTS as a criterion, and others use PTS a as a criterion. And the discussion that's now ongoing at the EU level is reflecting this diversity that exists, but I also mentioned that many national regulations are in the process of being revised, and I think it's a process that kind of goes hand in hand. So, there's a lot of discussion on the European level and there's also discussion on national levels. And my hope is that in the long run, they will somewhat agree on certain approaches. But I'm not expecting them to be harmonized at all. Sorry harmonized completely, I should say. But there will probably some degree of harmonization, which makes it easier for people to operate. For example, in the North Sea, where there are many neighboring countries to the North Sea, and if you go just move over the border by one kilometer, then you are in a different jurisdiction. So that's quite tricky. What's interesting in the EU also right now is that member countries who don't have specific underwater noise regulations, they seem to be waiting for the EU criteria to be defined. Because you can't define the criteria for this good environmental status without talking about or considering the TTS and PTS or behavioral criteria and masking and all this, you have to consider this in order to establish some criteria that really then that define what a good environmental status is. So it seems once the EU (TG noise) has come to an agreement, we might see a more unified move towards these kinds of, not the criteria themselves, but at least to take into account all these parameters that are being discussed in this TG noise.

Do you know anyone that's working on rules for activities in the Arctic? I know safety rules for ships in the Arctic recently got a new international push and with the expected increase in traffic in the Arctic and ability to operate in more ice-free times there might be more activity of all sorts happening. Is anybody working in the Arctic on rules, specific to that area, then it would be a primary for international cooperation as well?
So, the only true Arctic nation that I know of that has noise regulations, actually there's two, is Greenland, and Greenland and has noise regulations, which is from what I remember specifically tailored to seismic surveys. So, if the exploration in the Arctic were to be expanded or increased, there is at least in Greenlandic waters, some regulation or at least some guidance available. And Canada, of course, is a country, which has regulations that is clearly aiming at seismic surveys. Other developments, industrial activities up there, especially shipping, I think is not regulated and will hardly be regulated anytime soon. But other industrial activities are very likely to be regulated. The Canadian regulation, as I said, is under revision and then when you think about Alaska, there is this clear the MMPA and ESA apply, of course, in American waters in the Arctic. So, we've got these three countries that cover quite a bit of the Arctic environment.

And then there's the Antarctic, which has its own treaty. The Antarctic Treaty protects the Antarctic waters from such activity. You can get a permit for scientific reasons, but I think there's no industrial permits anywhere, south of 60 degree south. And there are two international agreements, the Antarctic Treaty agreement and the other one is the Arctic Council, I think, and they are aware of this problem, of course, and they are discussing it. I think they have guidance documents, but I'm not sure if they have any regulation in place.

Would you be able to recommend a case study that used the US 2016 risk assessment approach?
Not off the top of my head, I'm very sorry. I think right now the group down in California, they are not applying necessarily the framework, but they are working in their behavioral response studies to provide more information on this. Areal case study as such, no, I'm sorry. There will definitely be some developments, where this has to be applied, but these are then commercial ones…

Understanding that different methodologies may be needed depending on the activities, could you comment on a standardization of modeling methodologies.

Are we talking about noise propagation modeling or are we talking about an agent-based modeling, for example? [not specified in the question] Okay, so, so let me talk about noise propagation modeling. There are different ways to model sound propagation in the water and it all depends on the type of noise that you're modeling and the environment and there are initiatives on the way, or there have already been initiative workshops where people try to compare their modeling approaches to verify them and validate them. One data set was used to measure from a particular sound source and everyone applies that one particular data set to their model, and then they compare the outcome. So it's a theoretical comparison but also a practical comparison. And this is being developed… there \ are ongoing initiatives to make this to have a broader approach that was so far, mostly focused on seismic service, but now it's broadening to also include other sound sources.

Then there is agent-based modeling, which models the behavior of animals in reaction to different sound sources. And this behavior-based modeling, we call them the "animates".
You have to define the behavior of these animals… they represented the true behavior of a certain species, and you have to define that kind of behavior based on the best available knowledge. That's an evolving field, but it's becoming more and more important, and the risk assessment framework that I mentioned, is actually using this, and I think it's also included in the PCOD model.

Are there any regulations that will ultimately not approve a noise-generating activity, such as a seismic survey. How might an activity be modified in speaking with a regulator?

Well, it's a tricky one. Of course, it depends on the regulatory regime. Countries that don't have regulation, you can go and do, more or less, what you want, and other regulations that are very restrictive… For example, if you emit impulses that exceed 160 dB SEL in German waters, you have to monitor that very closely and you have to come up with a noise prognosis first, and if your monitored/measured values are exceeding this then you will have to stop your activity from what I understand. If you have, for example, a permit to do to conduct a certain activity and you find out that you exceed the levels and other regulatory regimes, you have to use what's called adaptive management. So you have to come up with, beforehand… you have already discussed with the regulator, okay, what's happening if we exceed these levels and this can be temporary or permanent stop of your activity. In temporary, a stop could entail, for example, that you go back to show/talk to the regulator, okay, we have encountered animals that we didn't expect, a protected species, or we encountered a species that we didn't expect in this time of the year or in this area, and we've seen more animals than we predicted. So for example, when you think about the take authorization, I don't know what would happen in the US, but if you come back and report after the fact, after you've done your activity, you have to report to the regulator, how many takes you had. I don't know how this is handled in the US if you say, oh, I'm sorry I exceeded the number of takes…that might be a legal problem. It's really difficult to come up with one answer. It really, once again, it depends where you are.

Is there any indication of a timescale for the European criteria being published?

No. Not that I'm aware of. I know that the good environmental status has to be reported in the spring of next year. So, each Member State has to report to the EU Commission, I think, by spring 2021, but I

don't know if the, if there's a timeline actually for the criteria to be ready by then. I don't think that's feasible.

Could you go a little further into how the European criteria will differ from the criteria that we have in the US, since the European criteria focuses on the good environmental status, the EU standard.
I am on very thin ice here, as I am not part of this group. I interviewed a couple of people who are in this TG noise…First of all, the approach the EU is taking is large scale. So, they're not looking at individual animals. They're looking more at the habitat. You have to consider what species you have in that habitat, and what it is that you want to regulate or want to avoid. How do you define a good environmental status? One thing I could think of is, for example, that you say okay, the numbers of animals of my population in this particular area should not be reduced and ideally it should even increase, if it was, for example, a threatened species or vulnerable species. That's one way to look at it. When it comes to the actual impacts, when you think about, for example, TTS and PTS or behavioral disturbance, then the question would be, how does the effect on an individual animal translate into population level consequences. So, we are back to those frameworks again, which are very data hungry. There is a lot known about harbor porpoises, I was saying earlier, we don't know too much about it, but that's more about their distribution year per year and season by season and the problem is to get the cause/effect relationship between let's say an impact on the one side, noise impact in one area on the overall distribution of animals in that area. So, if you want to define the good environmental status, you can look at the noise, and you can look at the distribution, but you don't necessarily get the connection between the two. You don't get the proof that A is causing B. That'll be very difficult.