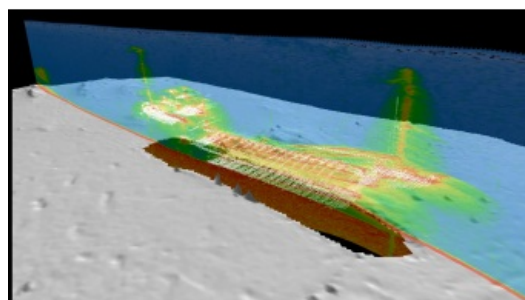
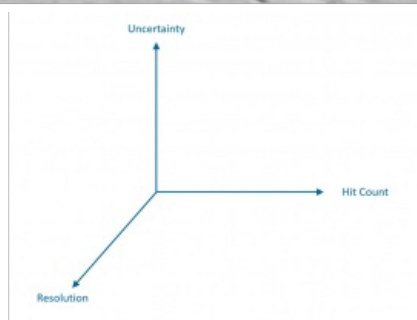


How I accidentally became a multibeam trainer



Client	TVU & THU	Other
A	IHO Exclusive Order	50 soundings per 1.0 x 1.0 m cell Coverage: 100 %, 35% overlap
B	IHO Special Order	6 soundings per 0.5 x 0.5 m cell
C	IHO Special Order	100 soundings per 1.0 x 1.0 m cell
D	IHO Special Order	50 soundings per 1.0 x 1.0 m cell Supporting bathymetry for UHRS processing
E	S-44 Special Order	3 soundings per 0.15m x 0.15 m cell. All exposed boulder bigger than 0.25 m on minimum one dimension (length/width/height) need to be localized Footprint size shall be no more than 1% of the depth of survey
F	Total Vertical Uncertainty of ≤ 0.1 m (99% confidence level) Total Horizontal Uncertainty of ≤ 0.1 m (99% confidence level)	Sounding density of ≥ 20 hits per square meter In addition, data resolution in the XY and Z directions must be better than 0.1 m, with all targets greater than 0.1 m in any dimension being visible and detectable from the data output.

When Jonathan Beaudoin delivered his first multibeam training session, it wasn't part of some grand plan – it started with a phone call and a willingness to say yes. Two years and more than 50 courses later, his 'multibeam crash course' has gained traction worldwide for its practical, learner-focused approach. In this piece, Beaudoin shares how he built a training style rooted in real-world application, peer learning and a clear goal: better surveyors, starting the very next day.



Looking back, I didn't set out to do multibeam training differently, it just happened that way. I don't know why I'm doing it differently, I just am. I don't necessarily believe that it *should* be done differently but I've found my groove doing

it this way and I think it's working. Plus, people tell me it's very effective.

How, you ask? What's different? I have a singular vision: I'm trying to make each trainee a better version of themselves the very next day they return to their job; that's my North Star that guides everything.

It all started with a phone call from my client, Steve. I did data analysis and troubleshooting work for him and his team but this time he wanted something different: multibeam training. He asked cautiously, as if he was worried I wouldn't be interested. I was still in my first year as a consultant and had promised myself that I'd say yes to as much as possible, to be open-minded about growing outside my comfort zone. I hadn't even thought about doing training when I decided to become a consultant. I had no lecture material to lean on and it had been a very long time since I had taught at universities earlier in my career. I paused, then decided to say yes.

My experience as a product manager in my previous job made me ask him some clarifying questions, including: 'Why do you need training for the team?', 'What kind of problem are you trying to fix?', 'Tell me more about your team's background and knowledge level' and 'Why are you asking me? Aren't you able to find training solutions?'

He went on to tell me that he had junior staff who were making rookie mistakes in the field. They'd leave the site with data that didn't meet specification, or they'd run the patch test lines incorrectly. He said he wanted them to understand the job specifications and which controls on the multibeam are critical to pay attention to.

He also said that existing trainings from hardware and software vendors taught you 'how' but not 'why'. He said that formal education in schools took too long, and didn't cover the practicalities. Graduates are left with the classic gap between book smarts and field smarts. He also mentioned that there are high-level short courses out there but they're too theoretical for someone very new in their career. Trainees would be left wondering 'How do I apply this?' when back on the job. He said there's a real gap in the market for solutions that fill in the holes between all those different types of training and education. He had been a student of mine back in our university days, he remembered my teaching style and he felt that I could probably figure something out to solve this.

I'm glad I asked him those clarifying questions as it forced me to start with a blank slate and a very clear goal: to give these young surveyors the practical knowledge they needed in as little time as possible with a high degree of learning and retention. I received example survey specifications from Steve then set out to develop lecture material towards this (see Figure 1).



Figure 1: Sample survey specifications from six clients in the offshore renewables sector.

From the table in Figure 1, I broke down the job of being a skilled multibeam operator into the three components that are most specified on any mapping job (see Figure 2). For each of these components, I tried to answer 'Why do clients specify this?' and 'How do you achieve it?' These three components are (1) resolution – sometimes you need to localize and detect targets of a certain size, (2) hit count – sometimes your client has exact needs in terms of measurements per square unit of area and (3) accuracy – sometimes your client has a maximum level of uncertainty they are willing to tolerate.

I then went through the sonar controller software interface and made screen grabs of everything, I scoured the operator's manual, and I created lecture materials to highlight which controls had a role in any one of the three aspects. I then put together simple and highly understandable drawings that told the story of what is happening behind the scenes but with only a very modest amount of math, theory or complexity. The idea was to give a taste of *why*, such that they had more understanding but were not overwhelmed with theory that wouldn't be of any help in a practical sense. If a topic or idea had no practical way of making them better surveyors, I didn't talk about it. That could be done later in their careers.



Figure 2: Foundational view of topics in the multibeam crash course.

The outcome was course material that met Steve's goals – training that offers practical, actionable insights to help hydrographic surveyors make confident, informed decisions in the field. Given that the course is completed in just a few days, I called it a 'multibeam crash course'.

The course went very well. At the end, Steve thanked me and said: "You know you're really good at this and other people are looking for this kind of training. Let me give you a few contacts."

Things blossomed from there. It has been just over two years since that first course, and I have now given this exact course or variants of it over 50 times. It has grown from a three-day course to five days. I have added more content to cover all the major multibeam vendors, as well as practical group exercises that we do while in class with survey calculators that I provide (see Figure 3). I offer the course privately to single teams but more and more I am giving open enrolment workshops with a mix of participants. This year, I am going global to Australia and Portugal with plans in the works for Brazil and Japan. The idea is to offer this several times per year globally.

With the large number of iterations in such a short period, there's a lot of opportunity to improve from the lessons I'm learning along the way. I've shared a few below.

1. Bridge – I need to meet trainees where they are at with their knowledge level and understand their backgrounds so that I can build a bridge from their knowledge to mine. It also helps me understand if I have some expertise I can leverage. There are always other experts in the room.
2. What & why – I always ask trainees what they want to learn and *why* they want to learn it. I get them to identify their own learning outcomes, the skills they want to walk away with. We share those in a group setting. I identify trainees that have skills that others are looking for and I leverage their know-how, experience and expertise to help me lift others. Everybody gives some knowledge. It's almost like I'm a coach and I'm building a team.
3. Discussion-based learning – I need to make trainees comfortable with discussion-based learning. I try to keep the class size small enough to build comfort, familiarity and trust. I drop the rank and formality, introduce myself as JB and not Dr Beaudoin, and sneak in a few Dad jokes. I get everyone in the room to contribute with real world examples, experiences, challenges and successes. I let their curiosity and questions determine what theory to cover when they want to go beyond the course material, which usually entails a visit to the white board. I try to create a fun and safe learning environment where there's room for the 'dumb questions'. They're handing me teachable moments; I make sure to use them.
4. Mentoring – I sometimes need to help employers and trainees understand that someone needs to own the job of mentoring after the training.

It has been a very busy two years and I'm very excited to bring this style of training to more and more people. Even though I found my way to this type of work quite by accident, I can't imagine doing anything else at all now that I'm here.



Figure 3: Working through a practical exercise in a group setting.