eOceans
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Answers to Frequently Asked Questions

What's your vision and mission for eOceans?

Why? Ocean assets are valued at $24 trillion – this is a fraction of what it should be following decades of overexploitation and misuse, which have eroded ocean health.

Vision? We envision an ocean where life is bountiful and threats are diminished, and where communities and the blue economy thrive with collaborative, informed, and real-time decision making.

Mission? We enable dynamic, collaborative, transparent, science-based, and informed decisions and actions by connecting data and results with all ocean stakeholders and rightsholders.

How we do it? We aim to gather 1 billion observations a day and to generate 1 million analytics per month that are shared with billions of people who make decisions that impact the ocean every day.

Theory of change? Through these collaborative opportunities and united decisions, collective actions can be made to improve ocean health and community resilience to change.

Moto? For the ocean. For us.

Solving a massive problem? Everything we know about the world's ocean and its influence on society depends on the important discoveries made by marine scientists. The problem is that science is manual, siloed, and slow — lagging years to decades behind business, society, and

ocean change. These delays cost billions of dollars and threaten communities, the blue economy, and ocean health. eOceans is fixing this by reinventing the way ocean science and communication is done, making it real-time, collaborative, and accessible to all.

## Data Ownership and Ethics?

After two decades of working with and listening to stakeholders, rightsholders, local and traditional knowledge holders, and other ocean explorers we put the tenets of ethics and privacy at the core of the eOceans platform. eOceans app users and data contributors own their data. They can use the platform for free to track their activities, log observations, and contribute to local or global projects they support. eOceans does not sell data or make personal or ocean data open access.

In support of F.A.I.R. data practices, but the user decides: There are strong arguments and proponents for Findable, Accessible, Interoperable, and Reproducible ocean datasets. The goal is to make it easy for anyone to access and use ocean data to explore trends. eOceans agrees with this in theory and makes it easy for users and Private Teams to download their standardized and geo-referenced datasets, complete with metadata using Darwin Core and WoRMS standards. However, both open data and black boxes of data, where contributors don't know how their data are used or who has access, diminish trust and enthusiasm, and leave many communities and species at risk of poaching and exploitation. These risks are problematic around the world, and especially in areas with lenient policies, minimal monitoring, and lack of enforcement. For these reasons, open data projects exclude and preclude fishers, tourism guides and operators, and Indigenous and local knowledge holders from participating. Combined, these are arguably the most important ocean stakeholders and any project that aims to monitor MPAs should include these groups.

Important for ethics in publications: Another essential reason for app users and data contributors to own their data and to decide how their data are used is in publishing. Publications, regardless of institution, need to follow strict ethical principles. If scientists gather data for one project then those data cannot be used for another project without explicit permission from the participants. Open data, therefore, would have limited value, but asking people to repeatedly report all their observations to all the researchers who might be interested would also not be ethical. We spoke with tourism guides that were being asked to report shark observations to more than ten researchers, and other observations of seahorses, turtles, jellyfish, and rays going somewhere else. By allowing users to own their data and seamlessly share it with all the researchers they support, they are giving permission at each step and therefore following ethical guidelines.

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Who uses eOceans?

Anyone that goes to sea with a smart phone — marine scientists, citizen scientists, ocean explorers, fishers, divers, tourists, etc.

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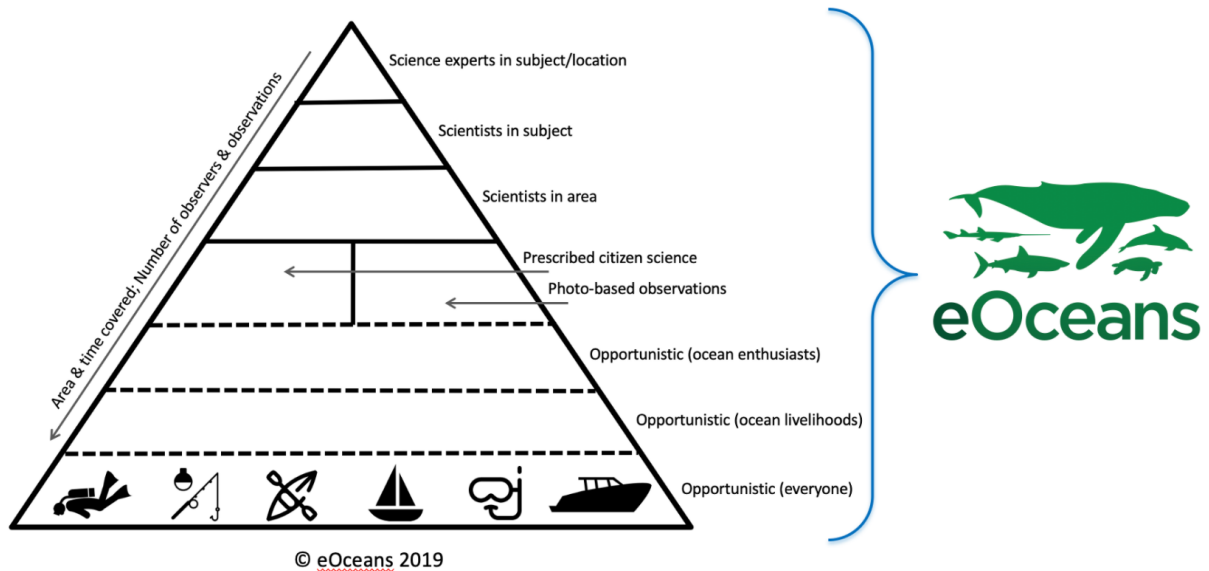
Why doesn't eOceans require photos of the exact species or item being logged, like other citizen science platforms?

For many reasons.

First, we don't want to encourage people to get close enough to take a photo — especially not close enough for a computer program to be able to identify the species.

Second, animals like space and often keep their distance, so if we required photos of all species then we would be seriously limiting the number of observations gathered.

Third, the oceans are vast and most 'sightings' are of zeros — zeros are just as important.

Fourth, people who work at sea — other than photographers — do not usually have a camera in their hands and are busy people. It cannot be expected that someone is going to be ready to capture an image of everything they see.

Fifth, capturing a photo of one thing — like a shark — does not provide any information about the factors influencing that shark. By capturing data from 'check-ins' (technically stationary point counts) and 'auto-tracking' sampling techniques (technically belt transects, distance sampling, or roving), and not just the presence of one animal, provides a more complete picture.

Sixth, instead of not trusting what people report by requiring a photograph, we use the data itself to validate and add error estimates. It really depends on the question being asked.

How good are citizen science data?

It really depends on the question being asked.

At eOceans, the question determines the data that can and cannot use, and the method used to select the appropriate data is pre-defined, defensible, and transparent (e.g., in a publication).

For example, if we are helping someone describe a species-specific question like "What is the seasonal distribution of leopard sharks, *Stegostoma fasciatum*?" then we may restrict the data to include observations only made by experts, such as people recording them accurately over a 2+ year time period. On the other hand, if we are helping a community understand the socioeconomic or cultural value of shark interactions, we may decide to use all observations where someone logged a shark regardless of their expertise and experience.

Doesn't scientific data need to have standardized effort?

Yes, and no.

eOceans is a platform for you and your team to collect and digitize your data, and to share with anyone that wants it.

If you're a scientist that only wants standardized data, then that's all you collect.

If you're an opportunistic citizen scientist, or a scientist collecting data on your way out to perform standardized data collection, then your data may be less standardized. It varies.

Our pilot projects (eShark, eShark Thailand, eManta, Great Fiji Shark Count, Shark Sanctuary Evaluation, Global Marine Conservation Assessment) were primarily comprised of opportunistic observations collected from the recreational dive tourism industry. Through these, we found that although they weren't specifically 'standardized' they were very close. Sites were regularly visited — daily, weekly, or monthly. Nearly 100% of dives were about 58 minutes, regardless of

the site. Most sites were surveyed in the same way, repeatedly. For example, surface to bottom (deepest part first), then slowly move towards shallower water following one of a few paths across the site, then head to the surface.

Many other activities are similarly approximately standardized. Ferry crossings, for example, go back and forth repeatedly.

On the other hand, other activities do not follow a standardized approach — fishers move with fish, for example. Fortunately, there are now a suite of statistical analysis that can handle varying effort through time and space.

Why do I need to include my activity?

Your activity is one of the most important pieces of information that influences what you observe.

Sailing across the surface of the ocean, diving or snorkelling below the surface, fishing from shore, taking a cruise, or lounging on a beach — all these activities enable different types of observations.

Your activity allows your effort to be standardized through space and time.

What if I don't know ocean species very well, can I still contribute?

Yes, for many reasons.

First, it's your data — you will get better as you learn more.

Even experts typically only know a few species really well, and as soon as they move to another area, they may have a harder time identifying species. The point is to do your best — look things up, familiarize yourself with local animals, learn what you can. Explore. And look things up again. You'll get better and better. If you're a tourist and you go to a new place every year, making it hard to improve, you can familiarize yourself beforehand, talk to locals and ask what they call different animals, and just try. With eOceans, your best data is all that is needed.

Second, it is best to be honest and err on the side of caution. If you think you saw a shark but it might have been a tuna, or something else, just record 'unknown fish' — then add your suspicions in a comment.

Finally, no one knows all species. Scientists know their suite of species well, and maybe a few others. Local naturalists and nature guides tend to know a lot of local species but may have troubles when they travel to new destinations. If you do your best, our analyses will handle the rest.

When Dr. Ward-Paige was starting her research, back in 2003, she ran a test of the ability of different people to identify sharks — asking shark scientists, fish scientists, and the public to compare different photos of similar or same sharks and asking participants if they could tell the difference and name either species. Only one person got perfect — a third year university student who had never seen a shark in real life but loved sharks.