

*“Creating a phytoplankton-fishery observing program for sustaining local communities in Indonesian coastal waters” ([FishPhytO](#))*

## **FishPhytO, Communities, Sustainability**

Prof. Charles Trick

The “why” we  
invested in  
FishPhytO.

Responsibilities  
of the path  
forward.



UNIVERSITY OF  
**TORONTO**

**CLIMATE  
POSITIVE  
ENERGY**

# Why did FishPhyto bring new technologies?

## **Four technical innovations that will change marine resource studies:**

1. Innovations in **REMOTE** measurements. (remote sensing, GIS, community participation)
2. New **SENSORS** to assist in innovative measurements (empirical observations)  
(Smartphones, distributed microscopes/knowledge) (Training, skilling). (Technical teams, Community knowledge). (Community)
3. Innovations in **DATA SYSTEMS** and data management. (Quality, convertible, data)(Research teams) (Community, Sustainability)
4. Innovations in **PURPOSEFUL SYSTEMS ANALYSIS**. (Data doesn't answer questions, communities do). (Sustainability)



# FishPhyto --- Communities --- Sustainability

## Key (Personal) Conclusions (“If we don’t do it, then it will not get done”):

1. You have new technology for exploring and observing your coastal waters.
  - Technology provides “**observations.**”
  - Observations are not valuable UNLESS observations are linked to **VALUES.**
  - The power of **ORGANIZATIONAL STRUCTURE** is needed to define the relationship between observations and VALUES. The organization must link observations to **VALUED-BASED** outcomes.
  - For example, the **MODEL/SYSTEMS THINKING** may hypothesize that temperature and water quality changes either move fish from one location to an alternate location (frequency of observations) or reduce fish reproduction or energetics (size and age).
  - How does this knowledge **IMPACT** the fishing community?
  - How do you **COMMUNICATE** this to the fishing community?



# FishPhyto --- Communities --- Sustainability

Consider this seriously: The power of **ORGANIZATIONAL STRUCTURE** is needed to define the relationship between observations and VALUES. The organization must link observations to **VALUE-BASED** outcomes.

- Local economics? Harvesting? Explanation (with no solution)?
- Country-wide economic planning? Economic activity.
- Seafood-security? Feed the masses?
- Recreational / tourist economies?

**SYSTEMS THINKING** and **COMMUNICATION** define the path to a VALUED PLAN.

Poor design means **non-valued observations**. The collection of data is non-sustainable.



# FishPhyto --- Communities --- Sustainability

## **Key (Personal) Conclusions (“If we don’t do it, then it will not get done”):**

1. You have new technology for exploring and observing your coastal waters.
2. Directive to develop peer relationships with engineers, technical developers, data scientists, system thinkers, communities (including Universities and local fishers), governments (policy), and sustainability.



# FishPhyto --- Communities --- Sustainability

Consider this seriously: **Community science** is a powerful approach for creating new scientific knowledge. Many projects fail because not enough care is taken in the (fishing) community connections. Community science improves science education, embraces and enhances ecological awareness (traditional knowledge), provides opportunities, and elevates social engagement with science.

- Citizen Science / Community Science is VERY challenging (but often ignored).
- Invest in the relationship before you make a “promise to the community.”
- Establish connections with a Natural Community leader.
- Set expectations and explain the VALUES with the leader and the team.
- Fully establish a COMMUNICATION PLAN – the meaning of the observations taken.
- Address PRIVACY issues
- Promote citizen GOVERNANCE of research data.

**THESE STEPS ARE VERY CHALLENGING TO DO PROPERLY.**



UNIVERSITY OF  
TORONTO

CLIMATE  
POSITIVE  
ENERGY

# FishPhyto --- Communities --- Sustainability

## **Key (Personal) Conclusions (“If we don’t do it, then it will not get done”):**

1. You have new technology for exploring and observing your coastal waters.
2. Directive to develop peer relationships with engineers, technical developers, data scientists, system thinkers, communities (including Universities and local fishers), governments (policy), and sustainability.
3. You have experience with smartphones - the center of innovation. (“If this app lets me understand fish, water quality, and location – then what else can we make it do?”). Developers + technology + data community.
4. “Skill the technology.” Build a community that explains why data is essential. This includes building communication, integration, and systems thinking skills. Show that knowledge is better than information.
5. Build BIG knowledge and communication—SUSTAINABILITY—in resources, food security, traditional life, and public health.



*“Creating a phytoplankton-fishery observing program for sustaining local communities in Indonesian coastal waters” ([FishPhytO](#))*

**The FishPhytO programs are just the beginning.  
Be innovative!**

Success depends on daily decisions and a long-term understanding that observations fail without communication, commitment to a plan, and dedicated engagement with the many tiers of the community.



UNIVERSITY OF  
**TORONTO**

**CLIMATE  
POSITIVE  
ENERGY**