

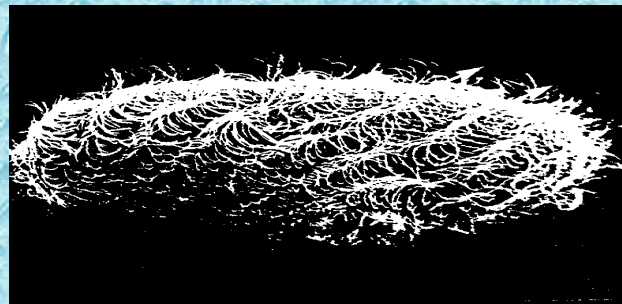
Challenges Facing Technology Transfer in the Marine Sciences

Scott Gallagher
Woods Hole Oceanographic Institution

Marine & Environmental Sciences Summit

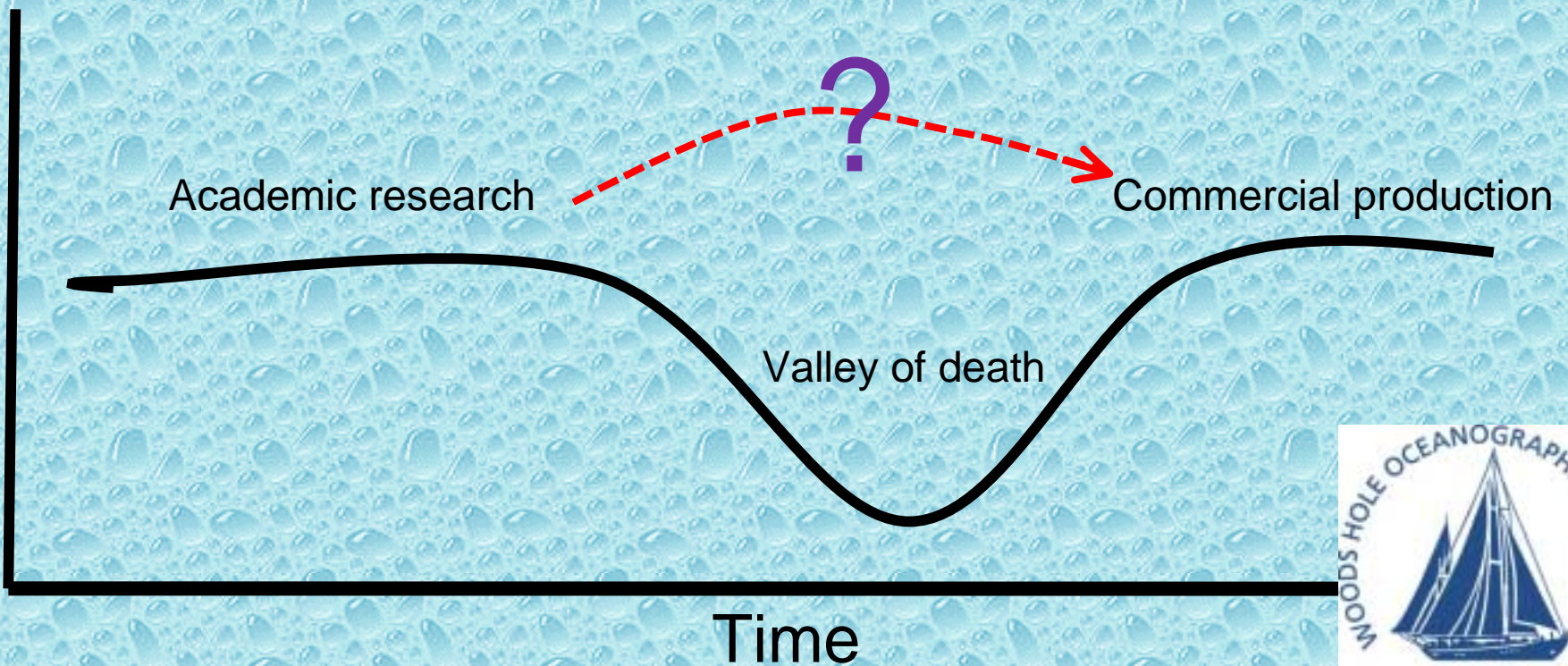
May 30, 2007

← 40 μm →



Technology Transfer

The process of developing practical applications for the results of scientific research



The Swimming Behavior Spectrometer (SBS)-

A bio-sensor to detect toxins in drinking water

- The Problem:

Readily available toxic contaminants affecting human function

- Bacterial toxins
- Heavy metals
- Irritating gases, cleaning solutions, oxidizing materials
- Organophosphates, pesticides

- The need:

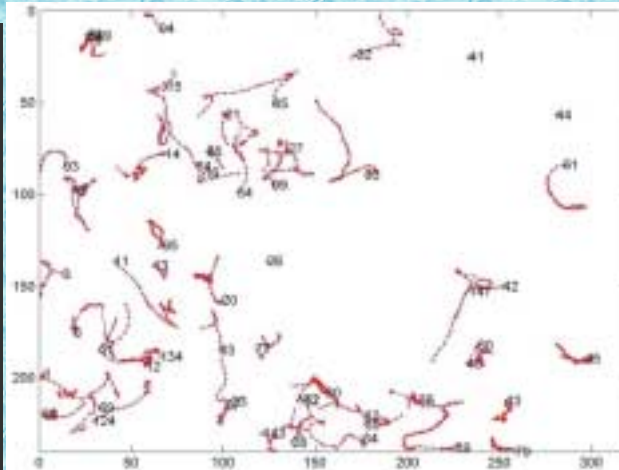
Rapid, broad spectrum detection system

- Bioavailability requires bioassays
- None developed or assessed



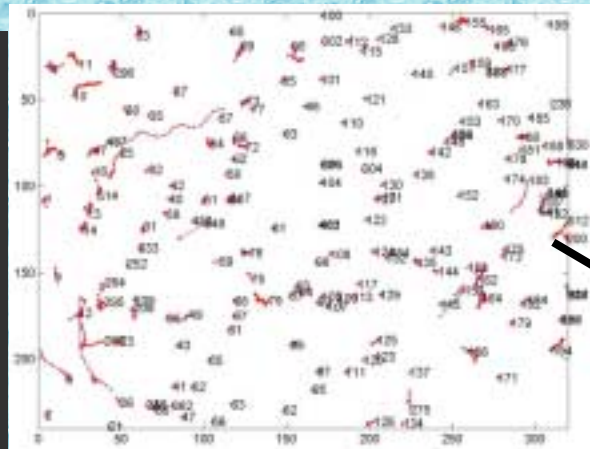
How the SBS works

Initial



Tracking algorithm
patent pending

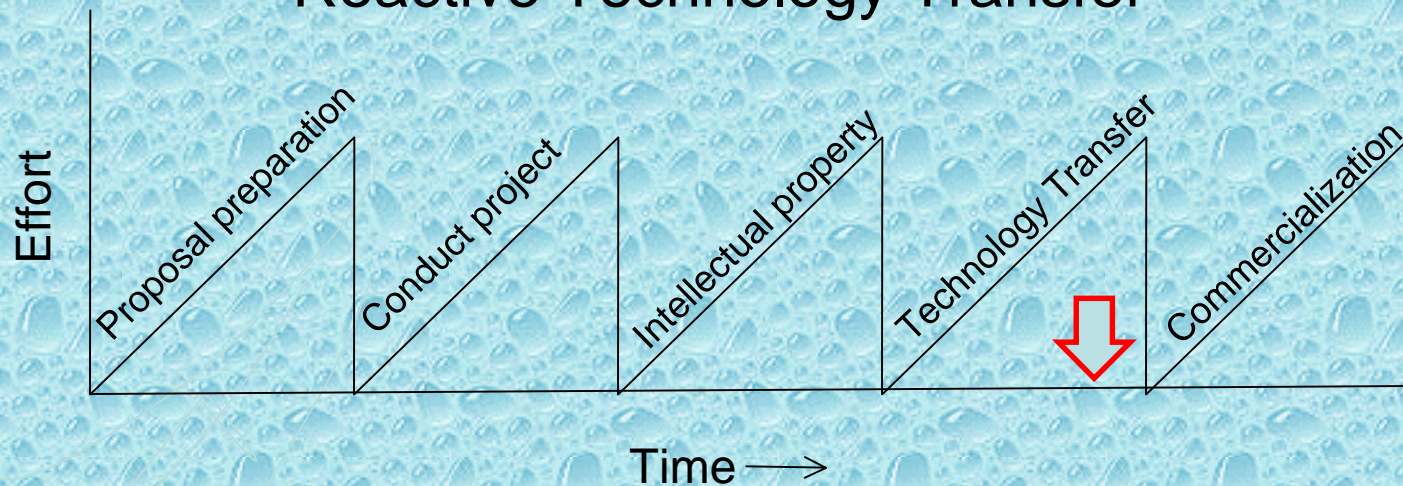
Seconds later 10 ug/L Cd



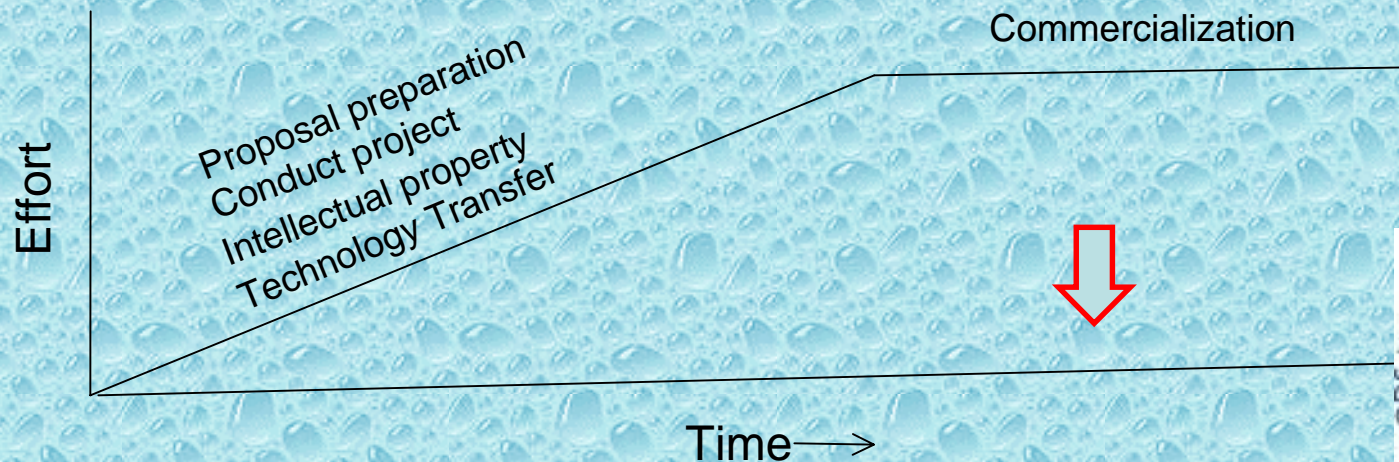
Threat Level web site
display



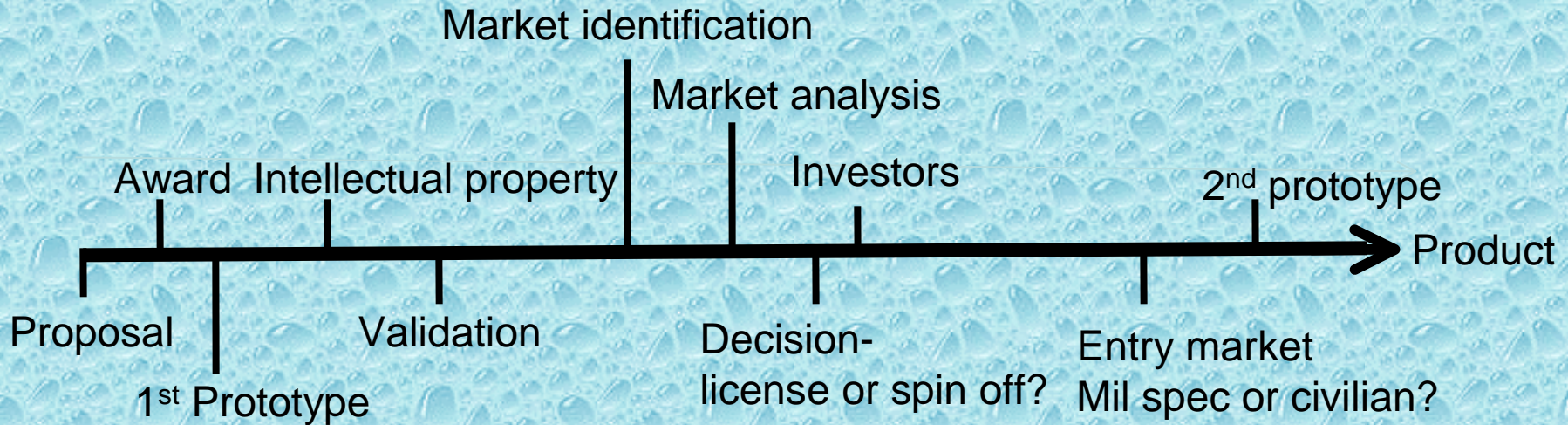
The SBS, what we did: Reactive Technology Transfer



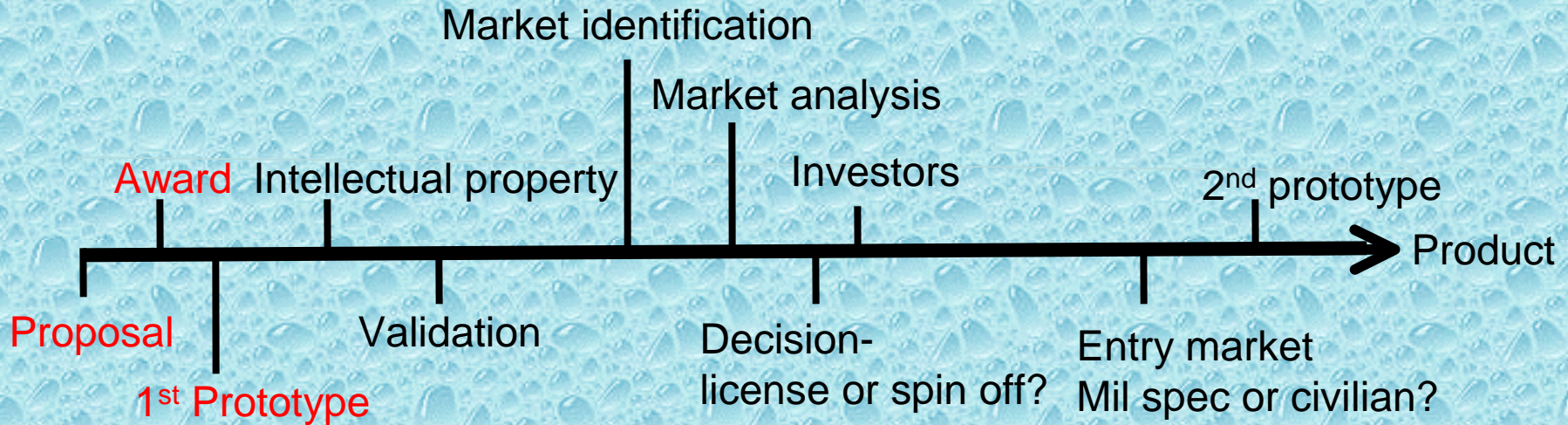
What we should have done: Proactive Technology Transfer



Development of the Swimming Behavior Spectrometer



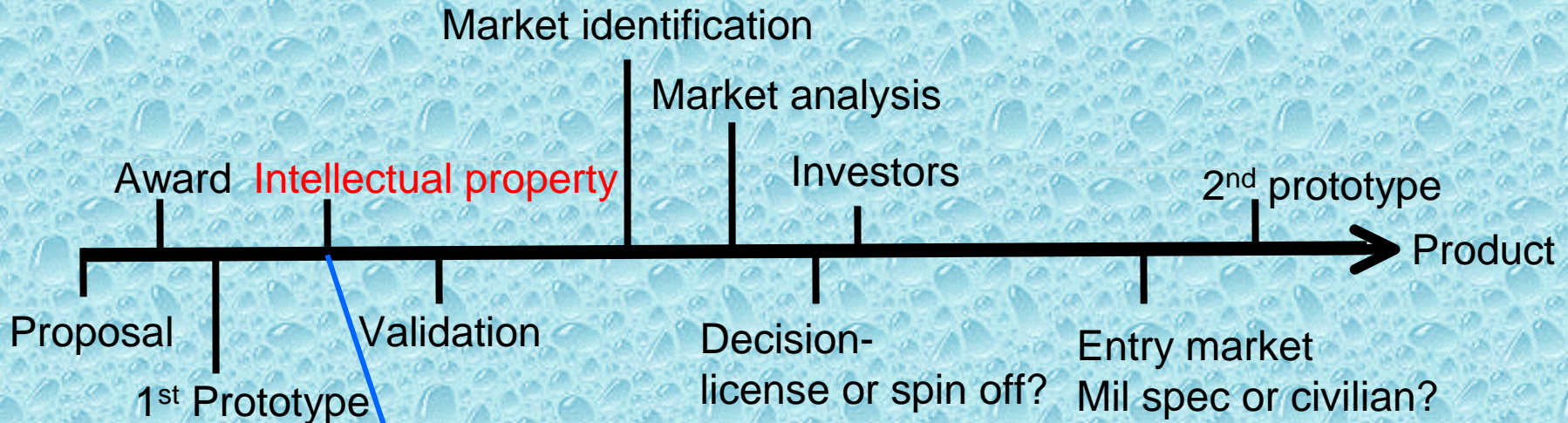
Development of the Swimming Behavior Spectrometer



Department of Defense contract
June 2004 - May 2005



Development of the Swimming Behavior Spectrometer

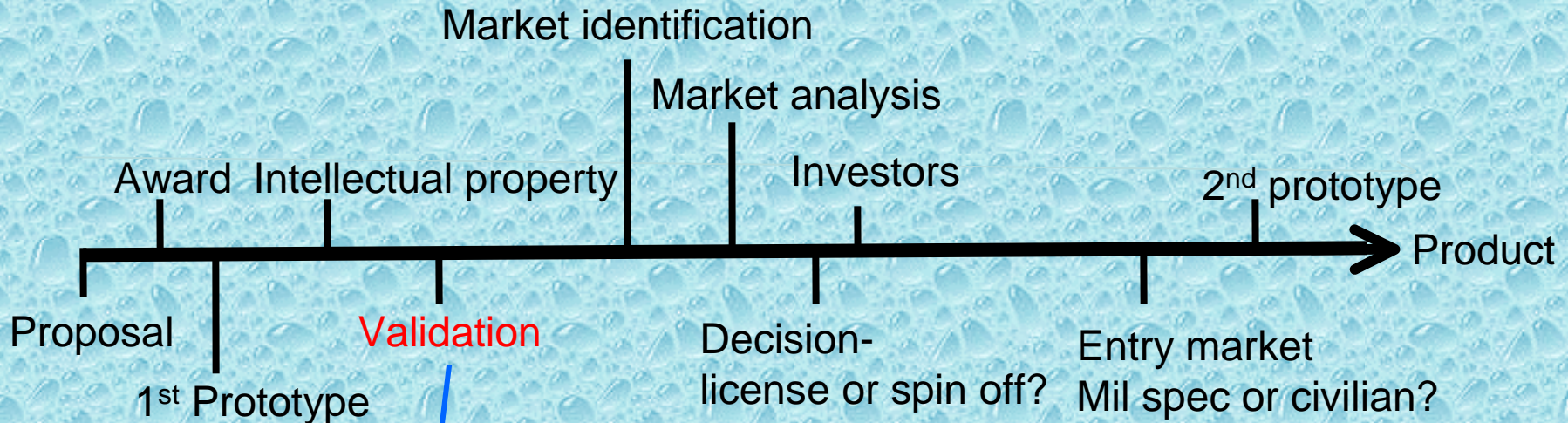


2 patents pending- May 2007

1. **overall system**
2. **software: algorithms for tracking, statistical decisions**



Development of the Swimming Behavior Spectrometer



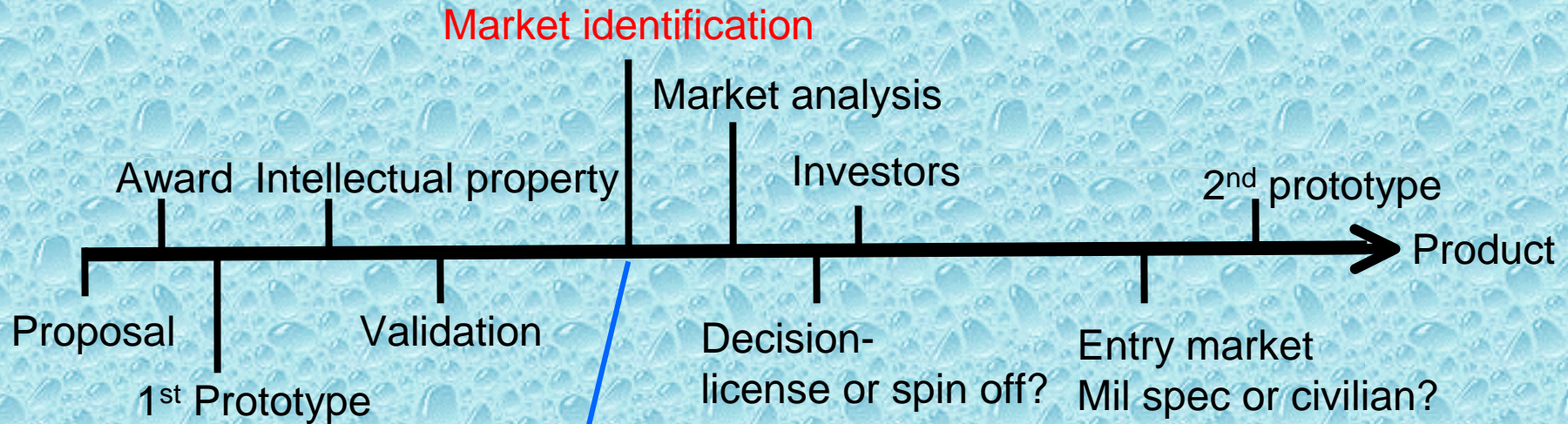
Battelle, Labs, June 2007

Evaluate:

toxicity threshold, precision, reproducibility,
false negatives, false positives,
ease of use, throughput



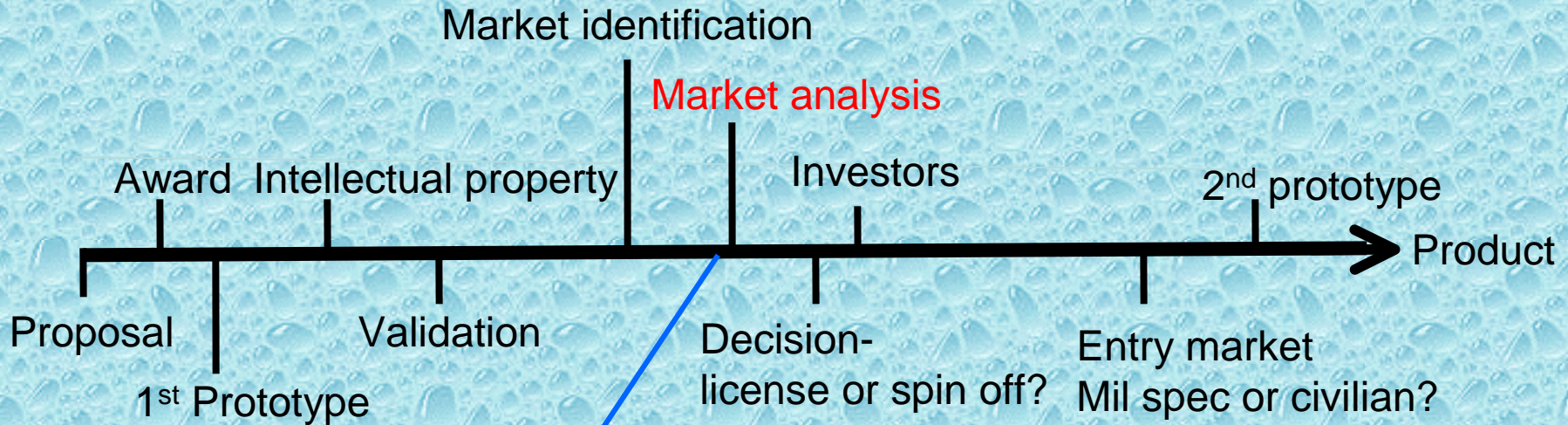
Development of the Swimming Behavior Spectrometer



- Municipal Water
- Pollution and storm water monitoring
- Homeland Security
- Airlines, Cruise ships
- Military
- Waste water treatment plants
- Pharmaceutical approval
- Food and Beverage testing
- Industrial discharge monitoring



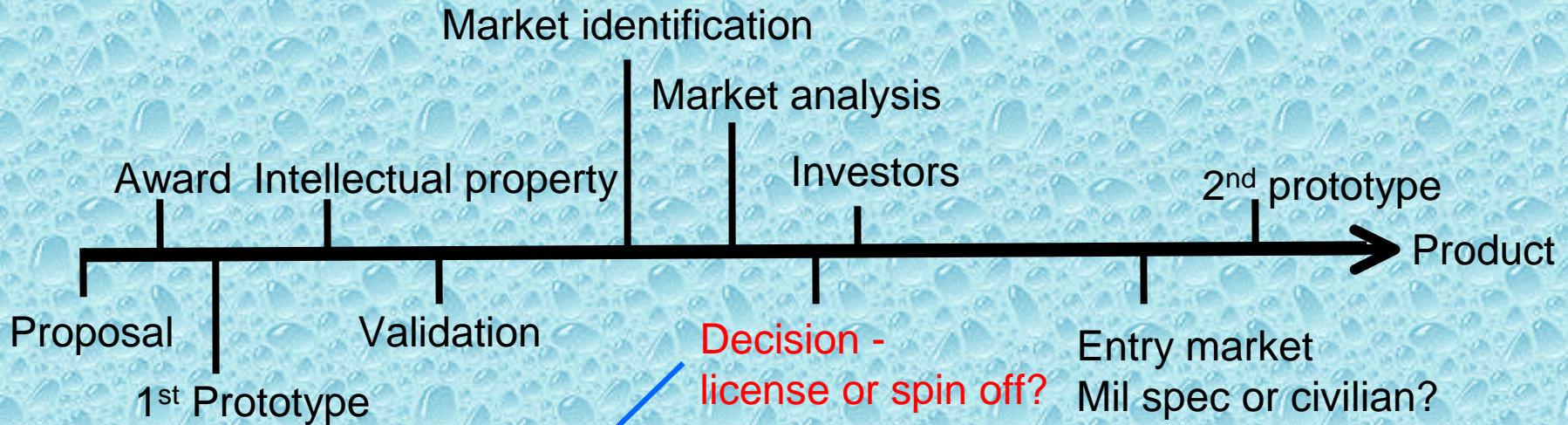
Development of the Swimming Behavior Spectrometer



Foresight Science & Technology
Water treatment plants
\$80 Mil with 8% growth
Need additional analyses



Development of the Swimming Behavior Spectrometer

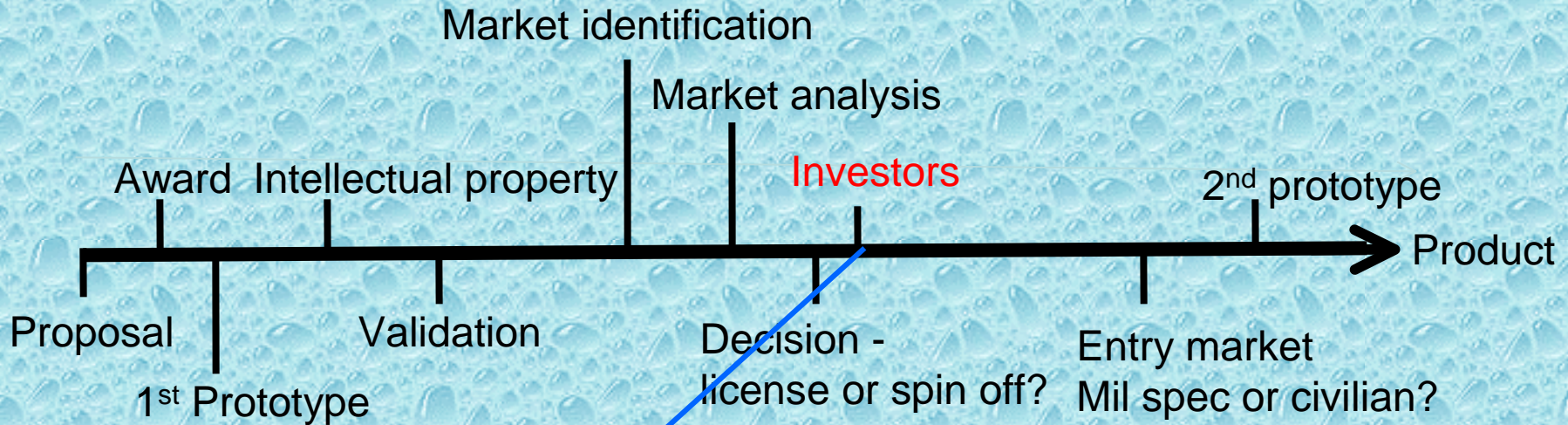


Spin Off: Platform for additional manufacturing

License: Stand alone product



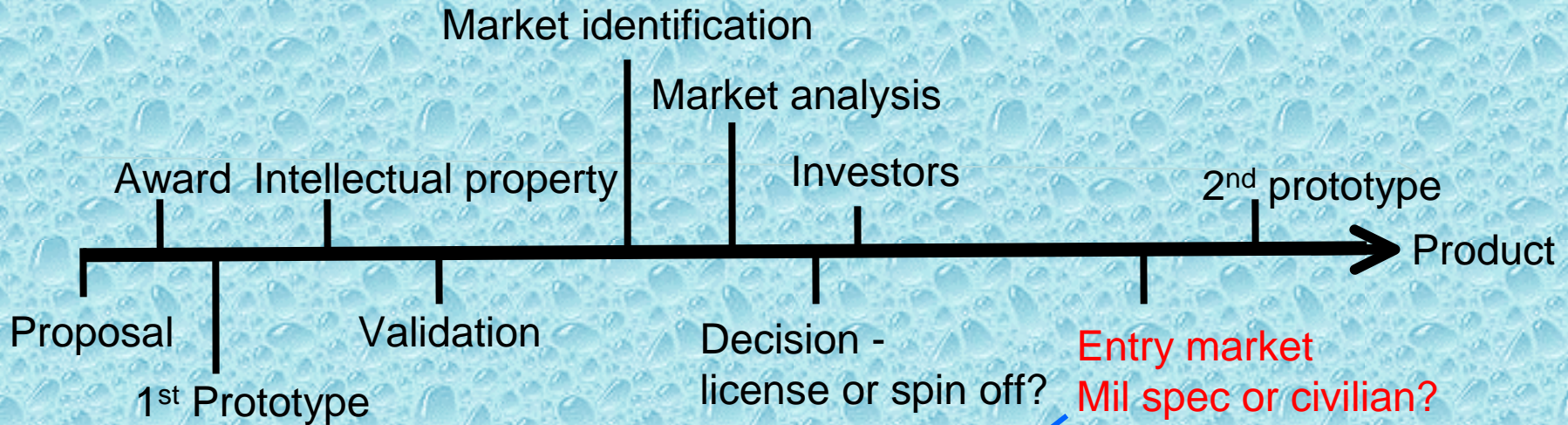
Development of the Swimming Behavior Spectrometer



WHOI
Venture capital
Angel
Government: SBIR, STTR
State: Mass Technology Transfer Center



Development of the Swimming Behavior Spectrometer

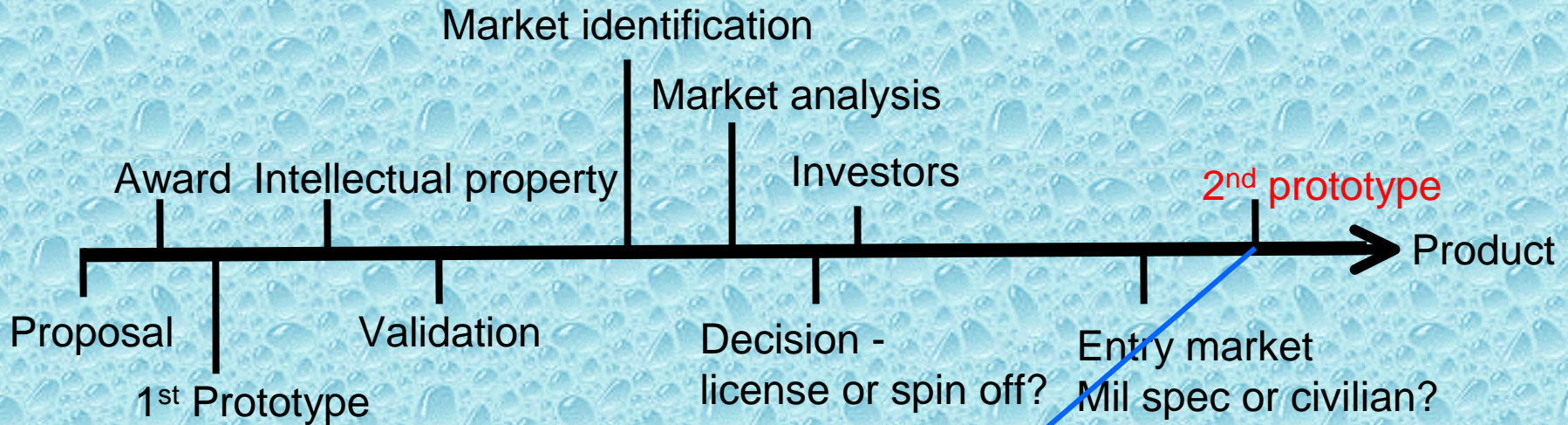


Identify Primary Entry Market

	cost	development time
Mil Spec	high	long
Civilian	low	short



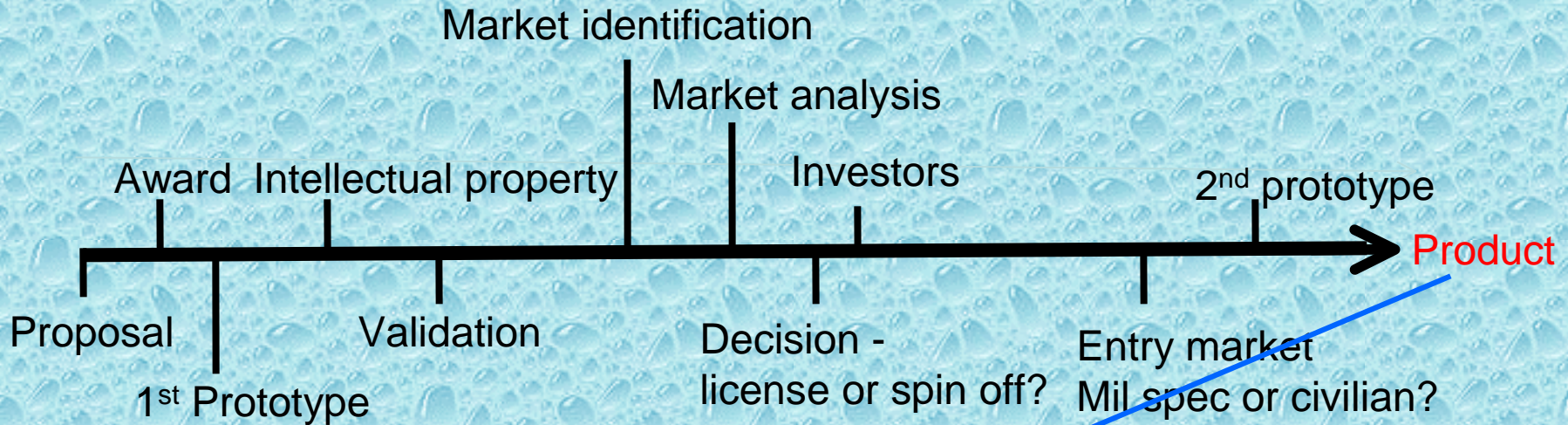
Development of the Swimming Behavior Spectrometer



- Small- Micro fluidics,
- Embedded processing
- Ruggedized



Development of the Swimming Behavior Spectrometer



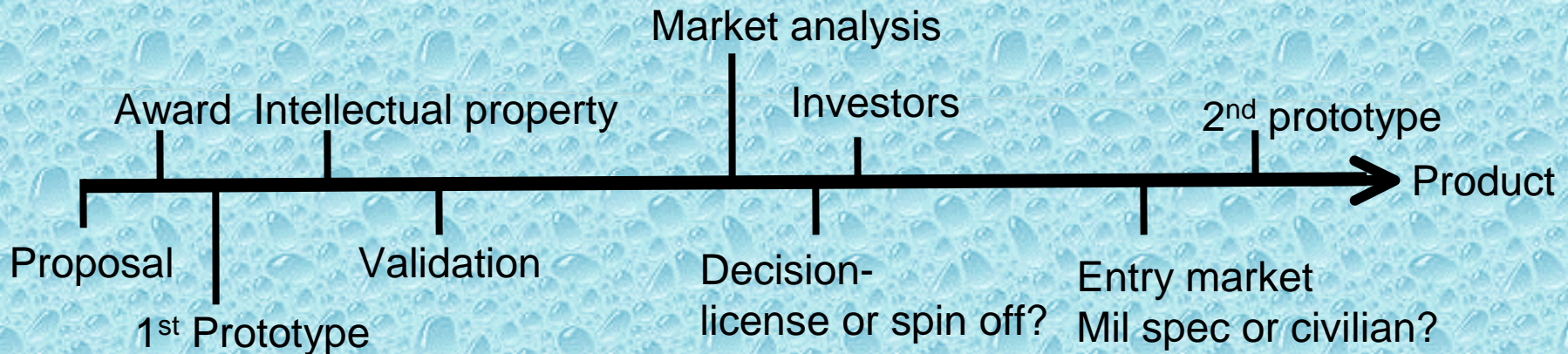
How many units?

Getting the word out

- Advertizing
- Technology shows



Development of the Swimming Behavior Spectrometer



Lessons learned from SBS Development: or How to minimize the 'Valley of Death'

- Start technology transfer early,
- Maintain open dialog with industry partners and funding agency,
- Identify as many market niches as possible,
- Early market analysis to determine development feasibility,
- Need early access to those knowledgeable about markets and capital resources (e.g., RTDC),
- Development funding is hard to find:
 - funding agencies believe Tech Transfer is responsibility of commercial sector

