

A scenic view of a beach with people swimming in the ocean and buildings in the background. The text is overlaid on the image.

# Progress Toward Rapid Monitoring Method Development

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# BEACH WATER MONITORING



Beachgoers feel protected



Reality

## The Problem



Culture method:

Results in 24-96 hours

## The Solution



qPCR:

Results in 2 hours

# BACKGROUND

- **Past studies mainly focused on technology development, less on implementation**
- **In 2009, the SCCWRP Commission formed a Rapid Methods Task Force**
  - to advance the use of rapid microbiological methods for beach monitoring and decision-making
- **Recommendation was made to conduct a demonstration project in summer 2010**
  - to use qPCR results to make public health protection decisions at the beach

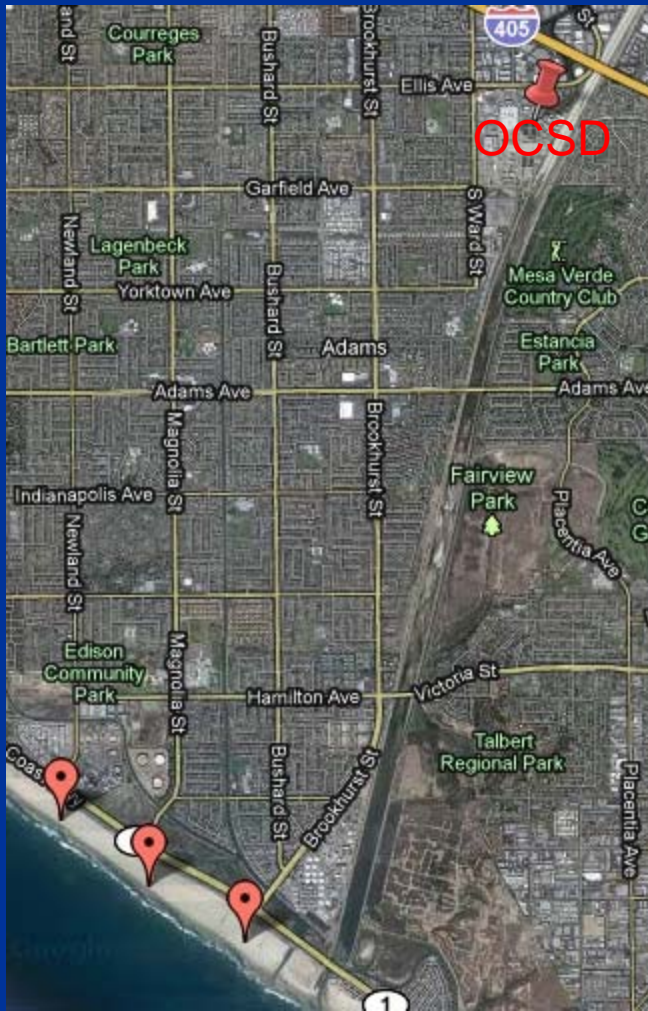
# RESEARCH QUESTIONS

- **Can the qPCR technology be transferred to end users in local labs?**
- **Can we achieve same day warning (i.e., by noon on the day when water samples are taken)?**
- **How does qPCR perform compared to current culture methods, when we use the current 10<sup>4</sup>/100ml criteria?**

# STUDY DESIGN

- **Where**

- Nine Orange County sites
- Three labs with differing levels of experience



# STUDY DESIGN

- **Where**
  - Nine Orange County sites
  - Three labs with differing levels of experience
- **When**
  - Training and Evaluation period: May/June
  - Eight week implementation: Jul 6 ~ Aug 31
- **How**
  - Current culture methods still performed
  - All methods in duplicate
  - Posting only removed based on culture data
  - SCCWRP as reference lab for qPCR

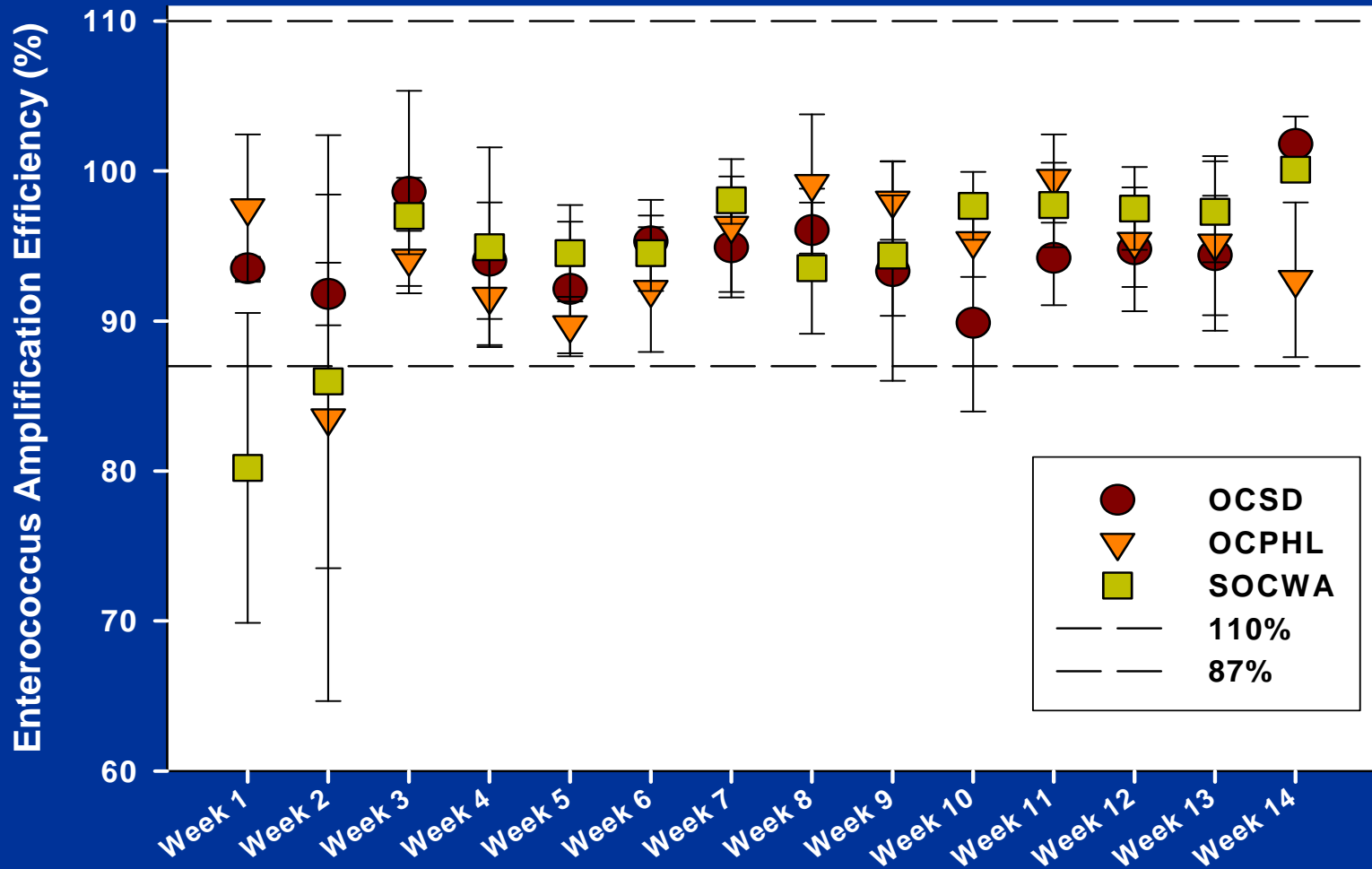
# TECHNOLOGY TRANSFER

- **When given reference material, can the labs produce good standard curves?**
- **When same sample analyzed in duplicate, can the labs produce repeatable results?**
- **When compared to a reference lab, can the labs produce comparable results?**



# TECHNOLOGY TRANSFER

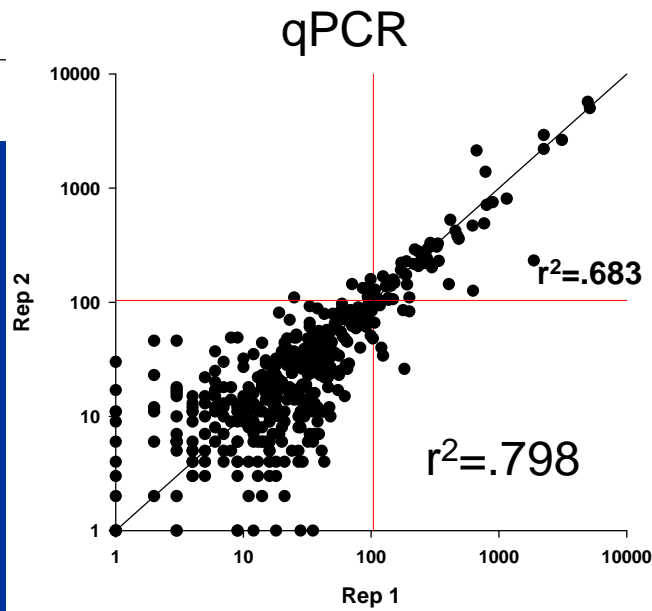
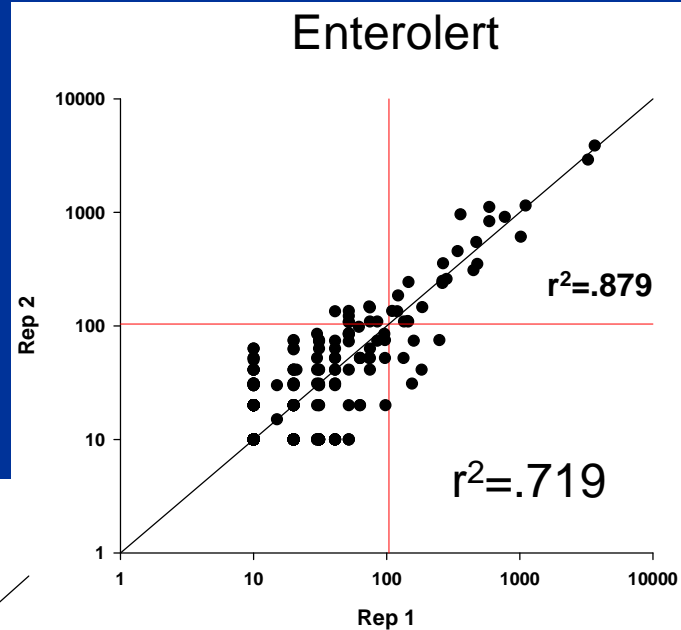
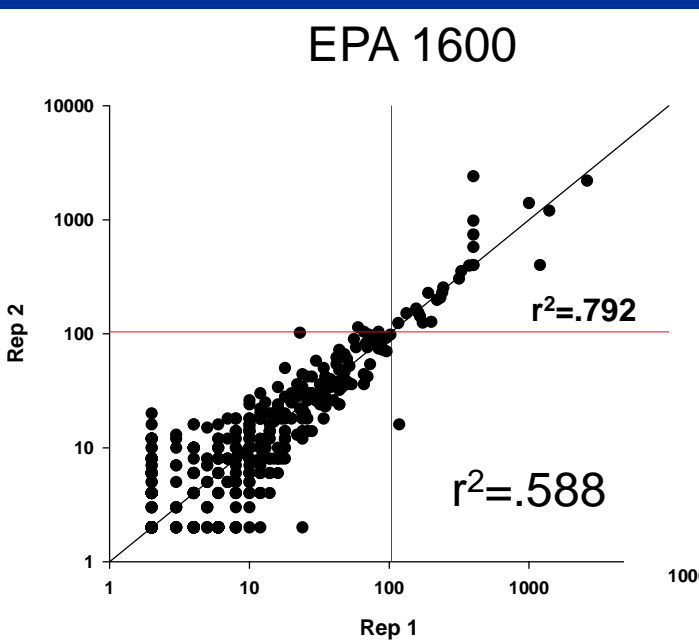
- All labs consistently achieved good standard curves after week2





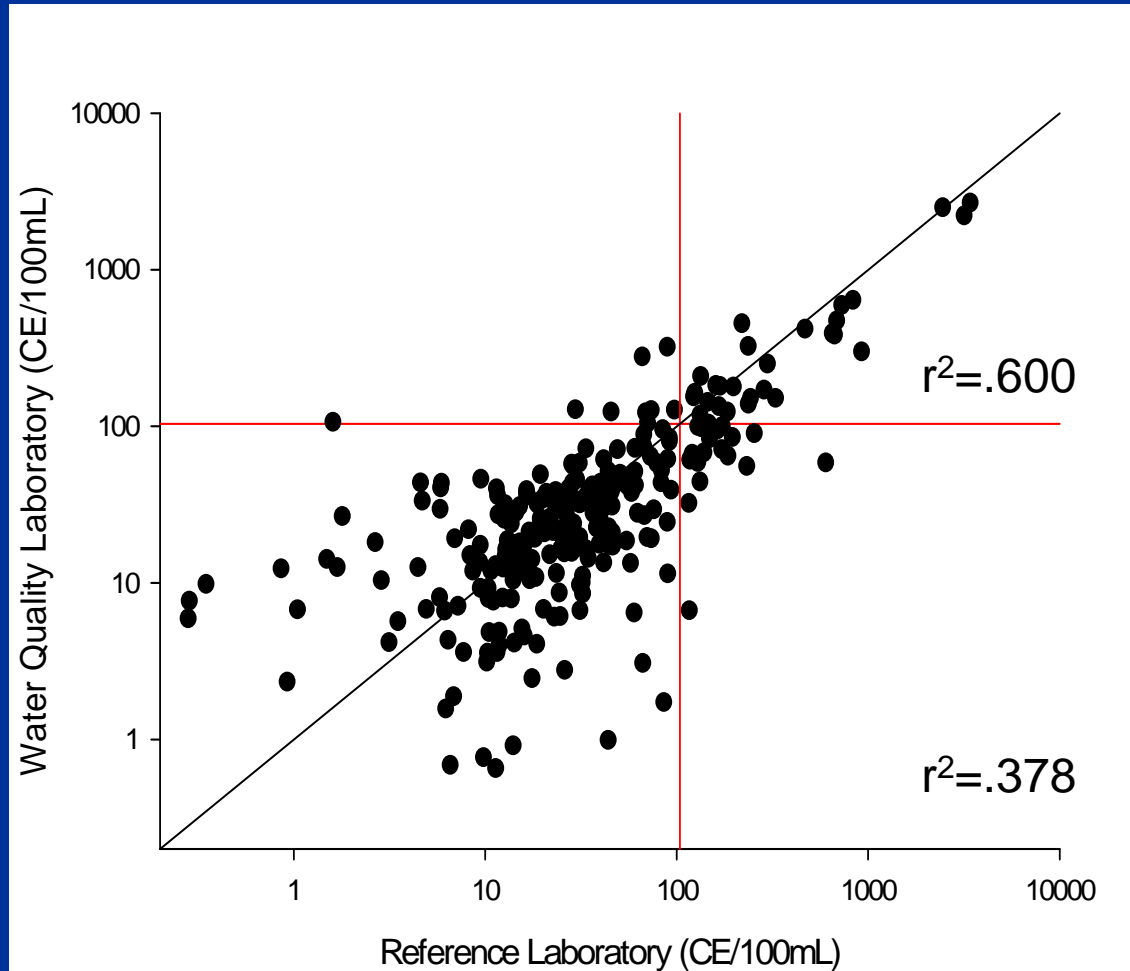
# TECHNOLOGY TRANSFER

- Labs achieved qPCR repeatability similar to those for culture methods



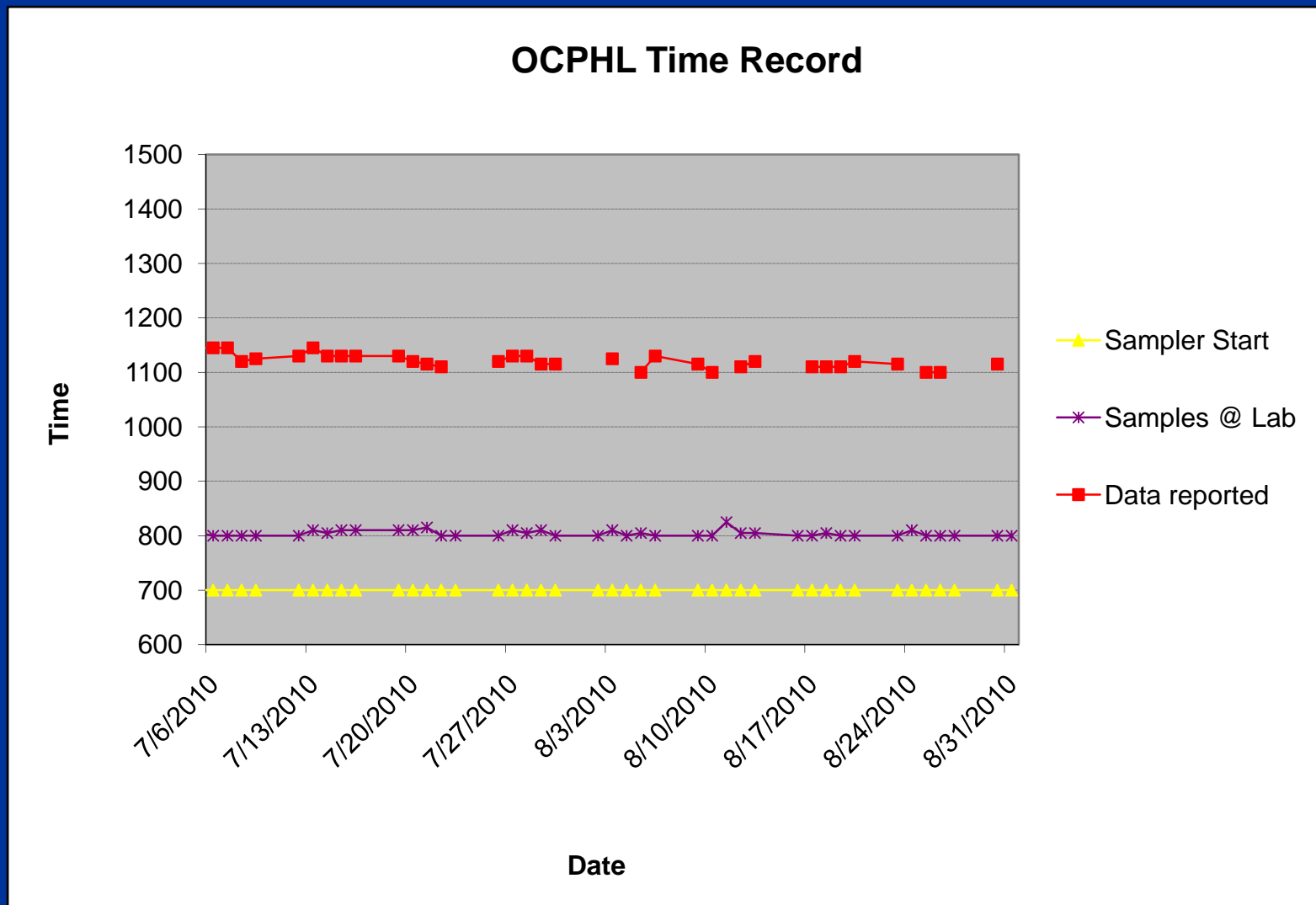
# TECHNOLOGY TRANSFER

- Local labs results were largely comparable to those produced by the reference lab



# SAME DAY WARNING

- Results reported to HCA by 11:30



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- Within 30min, decisions available on signage, twitter, web





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## today's water quality

**Doheny State Beach**

Friday  
July 2, 2010  
last updated 11:30am

sponsor logo

sponsor logo

sponsor logo

sponsor logo





[miocean.org](http://miocean.org)

# QPCR PERFORMANCE

- **Interference: 14% of samples did not have qPCR results**

# QPCR PERFORMANCE

- **Interference: 14% of samples did not have qPCR results**
- **Management decision**
  - Comparable agreement
  - Two times more posting

## EPA 1600

		post	no post
Enterolert	post	<b>3.6%</b>	<b>2.0%</b>
	no post	<b>0.5%</b>	<b>93.9%</b>

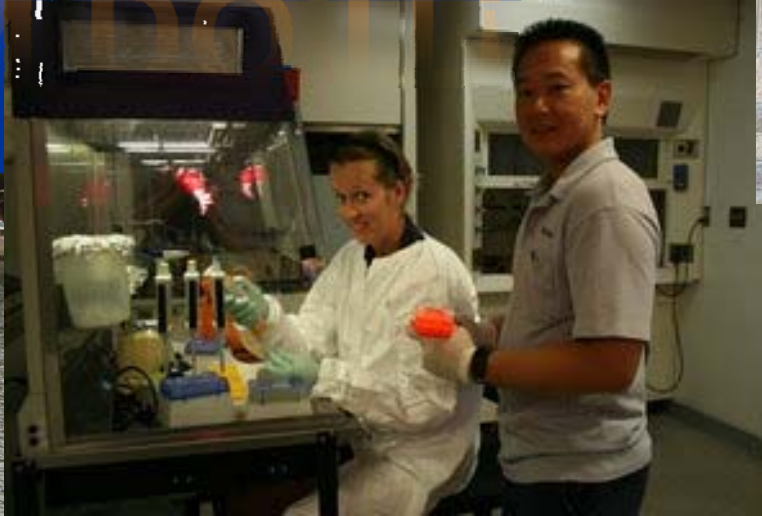
		post	no post
qPCR	post	<b>3.8%</b>	<b>7.2%</b>
	no post	<b>1.1%</b>	<b>88.3%</b>

Context:  
12% Reporting Error



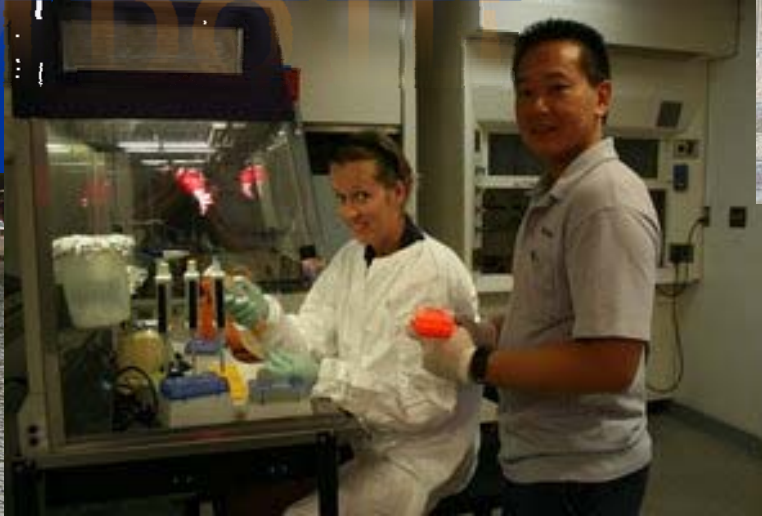
# BOTTOM LINE

# YOU CAN DO IT!



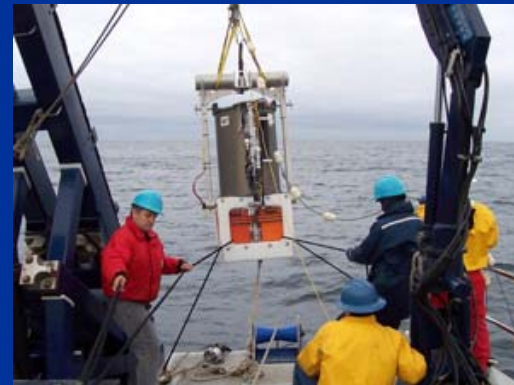
# BOTTOM LINE

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## EXCITING NEW AGE

- Molecular capacity in your lab
- Fully automated monitoring platform
- Hand held qPCR device



# Thank you!

