

# The Center for Microbial Oceanography: Research and Education (C-MORE)

An NSF Science and Technology Center (STC)  
“Class of 2006”

Paul Kemp, Associate Director  
Barbara Bruno, Education Director

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# Microbial Oceanography???

Ocean microbes control much of the world's production and consumption of:

- organic matter (biomass)
- nutrients
- oxygen
- carbon dioxide
- other greenhouse gases

They contain enormous genetic potential (pharmaceuticals, PCR, biotechnology!).

# MY MAGNIFICENT MARINE MICROBES

by David M. Karl and 'friends'



Penny  
"Rubisco"  
Carbon



Jon  
"Nif"  
Nitrogen



Sonya  
"Pho"  
Phosphorus



Ed  
"PR"  
Energy

A major goal for C-MORE is to inform the public that microbes are the key to Earth's habitability, not evil beings

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# C-MORE at a glance

- ~110 individuals
- 6 partner institutions in 4 states
- Many affiliates and “clients”
- Initial funding \$52M / 10 years

# Our Cooperative Agreement Mandates

## Integration

- Ensure partner institutions function together as an **integrated** whole united by common goals

## Responsibility

- **Balance and Integrate** research, education, and knowledge transfer activities

## A Competitive Workforce

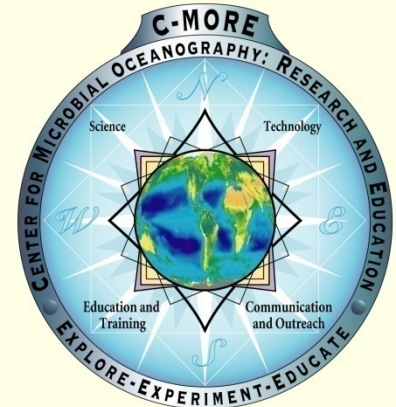
- Maximize **knowledge transfer**
- A “robust and substantive” plan for **diversity** of STC staff and participants. A plan to improve diversity in the national workforce.
- "**Americans first**"... especially **women** and **underrepresented** groups

# C-MORE MANAGEMENT TEAM

VC-Res



Dean, SOEST



C-MORE  
ExCom



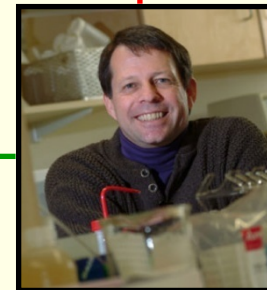
External  
Advisory  
Committee



Operations



Education



Research

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# C-MORE MANAGEMENT TEAM

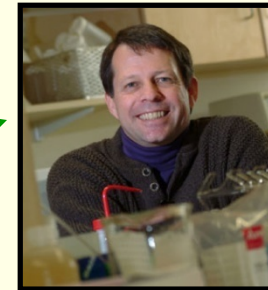
An AD-Centric view

Communication!

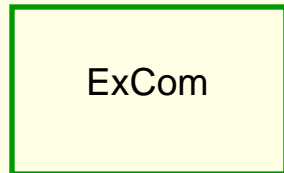
Higher Powers



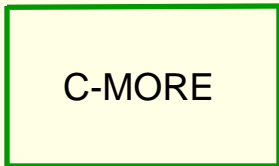
Research



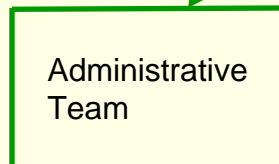
Education



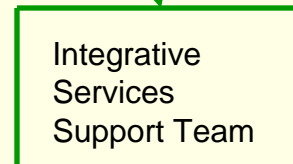
ExCom



C-MORE



Administrative  
Team



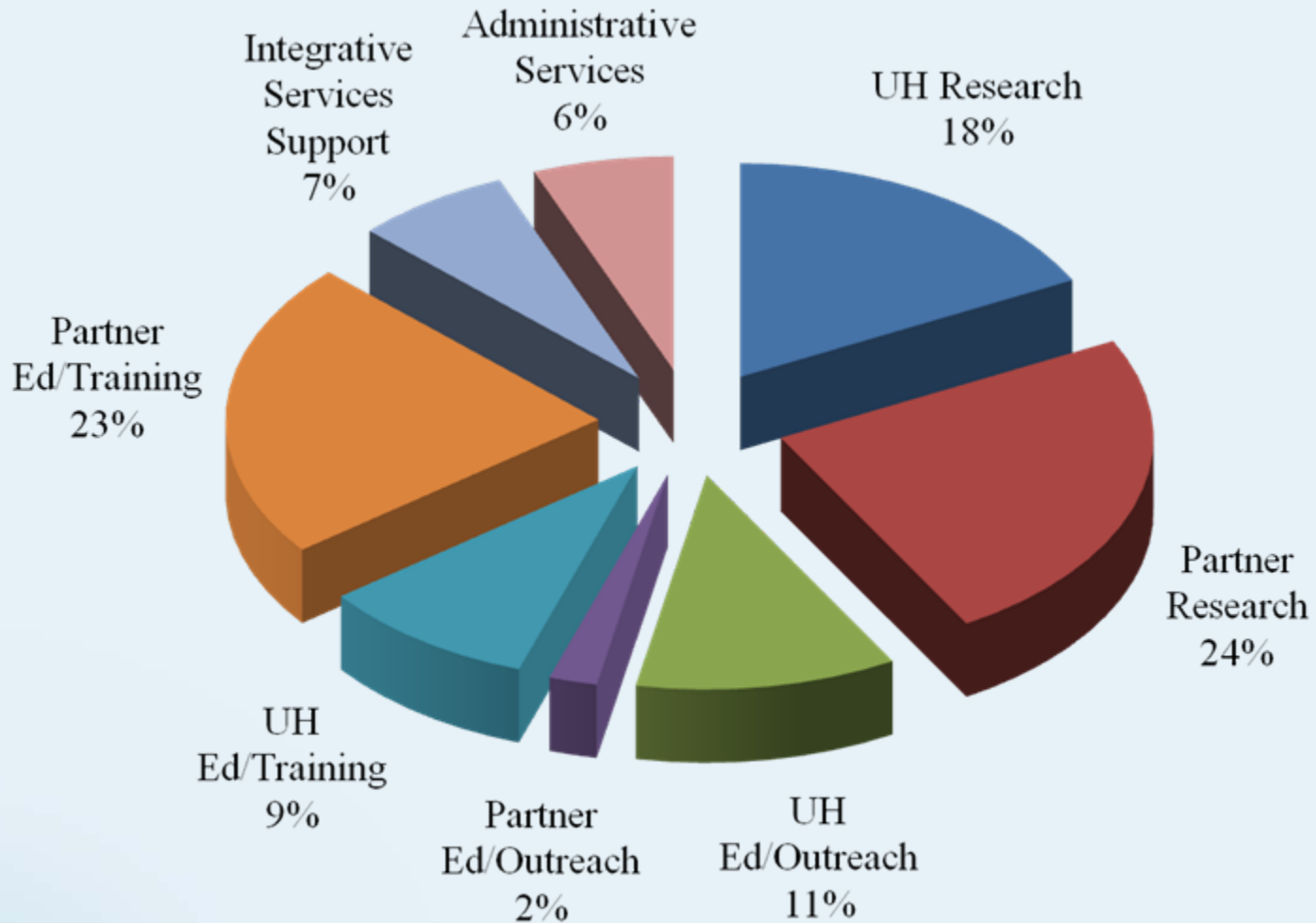
Integrative  
Services  
Support Team

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# Managed Allocation of Resources



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# Managing C-MORE's (Human) Resources

- More than **70%** (\$13M) of the 5-yr budget is spent on human resources.
- Multipurpose Centers must manage their human resources in order to achieve complex and sometimes conflicting goals.

# Diversity in the Future Workforce

Earth, Ocean & Atmospheric		Women			Men		
Graduate Students 2004	College Age Popln	#	%	Actual/ Expected	#	%	Actual/ Expected
White	61.7%	4819	82.3%	<b>133%</b>	5508	85.1%	<b>138%</b>
Asian (HI/Pacific Is)	4.3%	229	3.9%	<b>91%</b>	207	3.2%	<b>74%</b>
Black	14.1%	141	2.4%	<b>17%</b>	119	1.8%	<b>13%</b>
Hispanic/Latino	17.4%	302	5.2%	<b>30%</b>	235	3.6%	<b>21%</b>
Am Indian/AK Native	0.9%	27	0.5%	<b>51%</b>	40	0.6%	<b>68%</b>
Total		5854			6474		
Source: NSF		<b>47%</b>	PhD 39%		<b>53%</b>	PhD 61%	

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# Broadening Participation in the Workforce

## **Opportunities:**

Each C-MORE institution has unique opportunities to increase workforce diversity both internally, and through partnerships- and partners don't have to be nearby (C-MORE is proof of that)!

## **Challenges:**

We can't change the world by hiring.

## **Strategy:**

Our long term objective is to capture and entrain new students into education programs leading to a more diverse workforce.

# A Changing Workforce: the Future

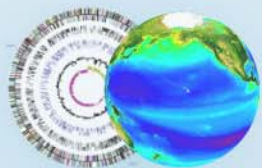
**But...**

**Change takes time:** We would like to see progress and success stories within a reasonable time frame- but does that conflict with where we need to put the greatest effort?

**And persistence:** What resources are needed to retain students, once entrained into C-MORE and affiliate programs?

**Success:** At what point does continued involvement in science become “inevitable”? Will we need to continue to invest resources into early career stages?

**Weighing the conflicts:** The STC program has multiple, sometimes conflicting drivers. How do we optimize our choices?



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