

**2012**  
**NSF Noyce**

High School  
Science & Mathematics Symposium  
Friday March 23, 2012

**DOWLING**  
COLLEGE



## **By the numbers:**

**13 schools**

**150 students presenting 110 projects  
each for judging by three judges**

**100 students attending workshops only**

**15 workshop presenters**

**20 workshop sessions**

**75 judges**

**1 outstanding educators award**

**1 beautiful day**

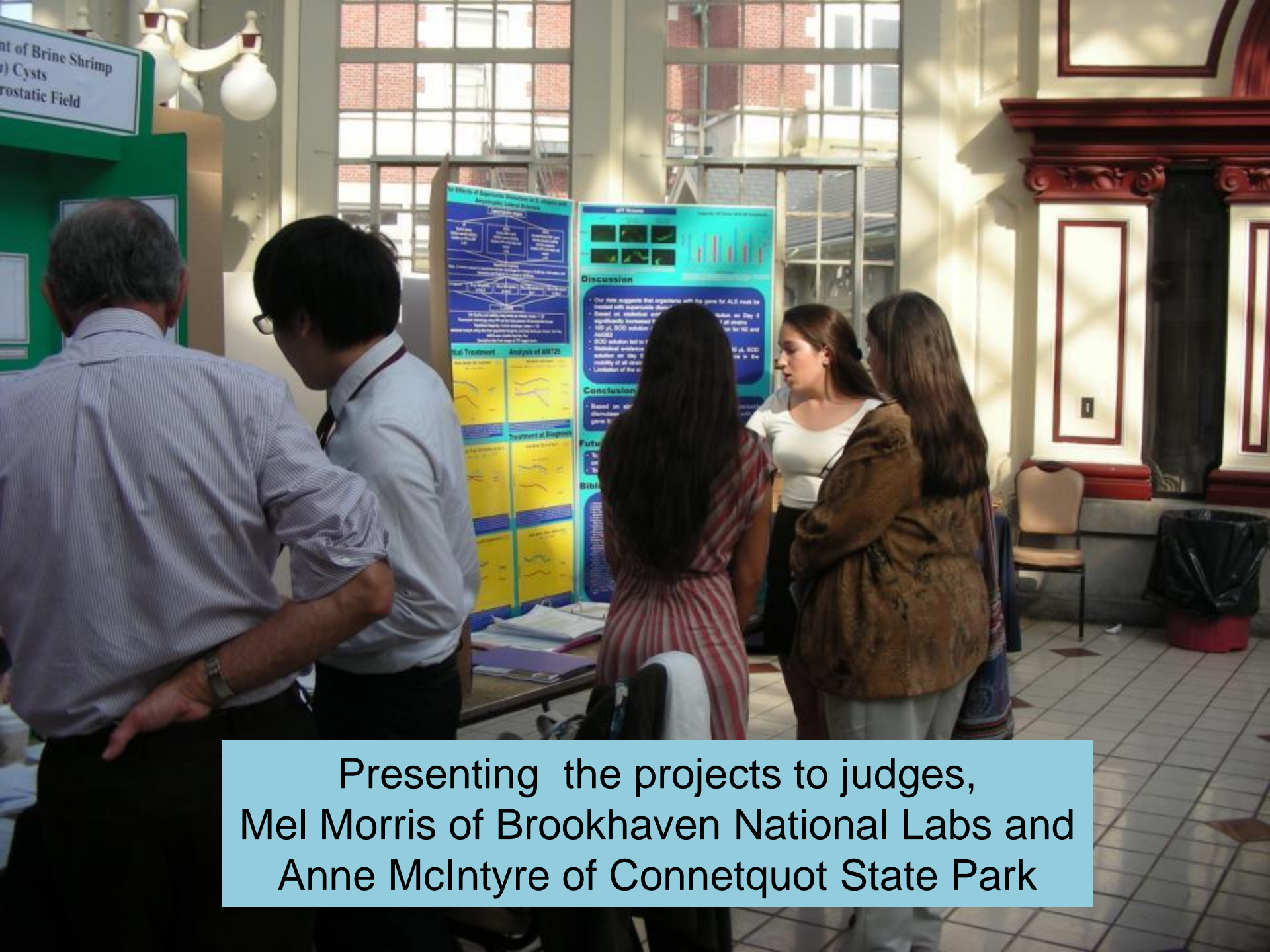
**Hot breakfast for all. Lunch for all**





Waiting for the judges in the Mayrock Conservatory





Presenting the projects to judges,  
Mel Morris of Brookhaven National Labs and  
Anne McIntyre of Connetquot State Park



NYSMEA Board member and workshop presenter,  
Dave Stolarz checks out the projects





Sarah Richards, 2012 Outstanding Educator Awardee and NYSMEA Board member listens intently to presentation



### Abstract

The impact of *Alliaria petiolata* on the restoration of salt marshes has not been fully understood. This study aims to determine the effects of *Alliaria petiolata* on the restoration of salt marshes. The study was conducted in two locations: a salt marsh and a forest. The study was conducted in two locations: a salt marsh and a forest. The study was conducted in two locations: a salt marsh and a forest.

### Introduction

Over 2,000 invasive species in United States alone. Invasive species have significantly altered the structure and function of the Eastern Longleaf Pine ecosystem. Invasive species have significantly altered the structure and function of the Eastern Longleaf Pine ecosystem. Invasive species have significantly altered the structure and function of the Eastern Longleaf Pine ecosystem.

### Introduction (cont.)

*Alliaria petiolata* is an invasive species that has been found in salt marshes and forests. It is a member of the Berberidaceae family. It is a member of the Berberidaceae family. It is a member of the Berberidaceae family. It is a member of the Berberidaceae family. It is a member of the Berberidaceae family.

### Hypothesis

We hypothesize that sites invaded by *A. petiolata* will have lower biomass and lower species diversity than non-invaded sites. We hypothesize that sites invaded by *A. petiolata* will have lower biomass and lower species diversity than non-invaded sites. We hypothesize that sites invaded by *A. petiolata* will have lower biomass and lower species diversity than non-invaded sites.

## Effects of *Alliaria petiolata* on Salt Marsh and Forest Ecosystems on Long Island, New York

### Methodology

Study sites were selected based on the presence of *Alliaria petiolata* and the presence of *Alliaria petiolata*. Study sites were selected based on the presence of *Alliaria petiolata* and the presence of *Alliaria petiolata*. Study sites were selected based on the presence of *Alliaria petiolata* and the presence of *Alliaria petiolata*.

### Methodology

Core samples were taken from the study sites. Core samples were taken from the study sites. Core samples were taken from the study sites. Core samples were taken from the study sites. Core samples were taken from the study sites.

### Invaded Sites



### Non-Invaded Sites



### Invaded Sites







Dr. Lori Zaikowski, Chair of the Dowling Department of Chemistry and Physics and conference organizer



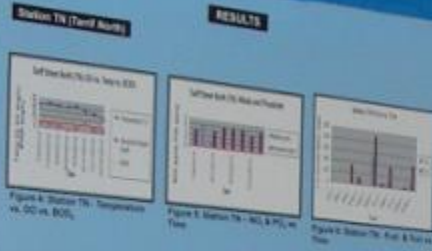




Merryl Kafka, NYSMEA Board member and workshop presenter, explores a project with a student



A Water Quality Study of Green's  
Creek Correlated to Land Use  
Long Island, New York



Station 66

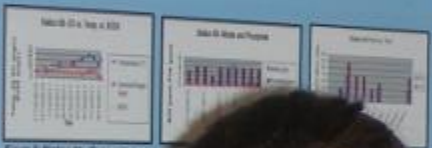


Figure 1. Station 88 - Temperature vs. DO vs. pH.



Figure 18: Station 4: Temperature vs. CO<sub>2</sub> vs. pH



## RESULTS

## ANALYSIS & DISCUSSION

**Downloaded Oxygen**—Water temperature was constant at 22°C (68.7°F) in the summer months at all stations and there was a strong inverse relationship between temperature and DO observed. Downloaded oxygen was observed at all sampling locations during the summer months and below its mean (10.0) elsewhere where DO levels fell below 5.0 mg/L. DO was observed at Station 6a from June through August and at all of the remaining stations from July–September. Not entered was October for Station TM.

GC assays indicate that copper concentrations are below values due to the presence and collection of decaying organic matter (Zhang et al., 2011). Also, nitrogen-to-copper ratios may indicate the need for copper through bacterial reduction of ammonia to nitrite (Zhang and Huo, 2003). The concentrations seem to vary, as Gwangju Coast freshwater ecosystems will certainly impact the function and survival of biological organisms, especially the Red-tailed Tropicbird, which is a vulnerable species of Breeding Bird Conservation Area (BBCA) of South Korea. The Gwangju Coast and Bay is considered to have high GC concentrations for Stream 1 and 2 when compared to other stations.

**Phosphorus** - PUN was recorded at high concentrations for all stations each month for the year, except at Station 1N in July. Each station except for 7a (also listed in next PUN category) TMDL of the time.

**Period Caliform Bacteria.** While *Flav* were detected at stations 2, 4, and 7b, they were associated with *Flav* and

Waterborne and airborne warming events throughout Clark County in June 1991 (1428 and 1729, 2011). Stations 6 and 7 did not show any harmful events of *Tox* bacteria during and are likely influenced by the reduced heating effects of sediments that occur immediately north of reef station. Station 1 showed the greatest frequency and highest *Tox* levels in areas that were not associated with storm events and pathogenic bacteria entered the surface water through heated sewage systems associated with a high water table.

Hypothesis	Accepted	Rejected
H <sub>1</sub> : $\rho_{12} = \rho_{13} = \rho_{23}$	0.0000	0.0000

[illegible]

## CONCLUSIONS

...the greatest degree of water quality  
...is likely due to a combination of factors  
...of water from drainage  
...therapeutic and natural  
...water table is higher  
...in the final phase.

NYSMEA member, judge Jen Porcheddu listens to presentation of Marine Biology Award winning project by Sarah Monastero and Dara Hofmann of Sayville High School



Dan Ness of Dowling Earth and Marine Science Department interacts with student during his judging duties



# The Effect of Copper (II) Sulfate on *Artemia Salina*

## Results

The purpose of this experiment was to determine the effect of copper (II) sulfate on the growth and survival of *Artemia salina*. The experiment was conducted over a period of 14 days. The results of the experiment are shown in the following tables and graphs.

The first table shows the number of *Artemia salina* that survived in each of the five different concentrations of copper (II) sulfate. The second table shows the average length of the *Artemia salina* in each of the five different concentrations of copper (II) sulfate.

## Discussion

The results of this experiment show that copper (II) sulfate has a negative effect on the growth and survival of *Artemia salina*. The number of *Artemia salina* that survived decreased as the concentration of copper (II) sulfate increased. The average length of the *Artemia salina* also decreased as the concentration of copper (II) sulfate increased.

These results are consistent with the hypothesis that copper (II) sulfate is toxic to *Artemia salina*. The results also suggest that copper (II) sulfate may be used as a pesticide to control the growth of *Artemia salina* in aquaculture systems.

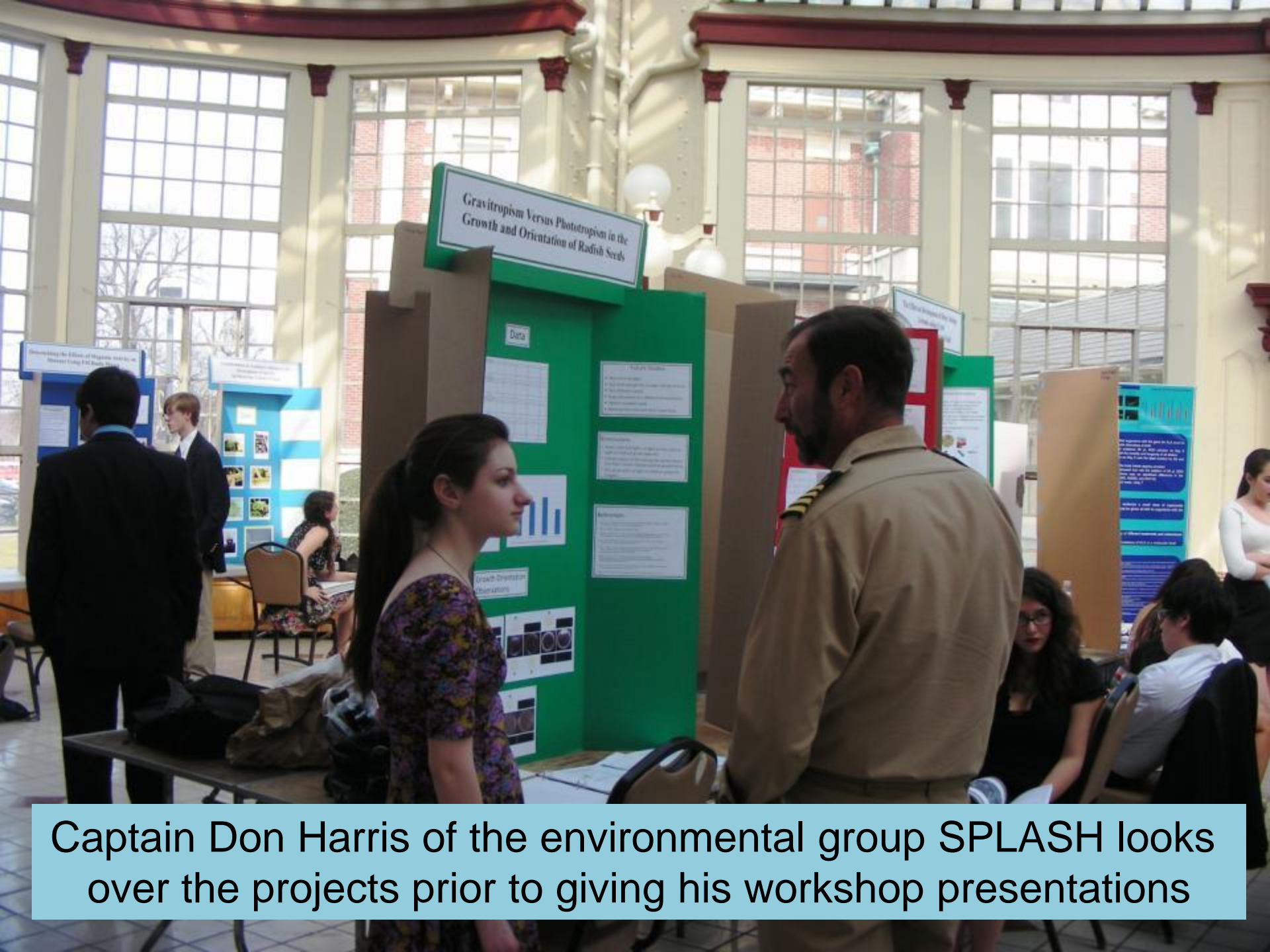
## Future Investigations

- In the future, this experiment can be modified to determine the effect of other heavy metals on the growth and survival of *Artemia salina*.
- The effect of copper (II) sulfate on the behavior of *Artemia salina* can be studied as well. This information could be useful in the development of new pesticides.
- Research can also be done to find the lethal dose of copper (II) sulfate for *Artemia salina*.
- Further research can also be done to find an antidote for *Artemia salina* that has been exposed to copper (II) sulfate.

## References

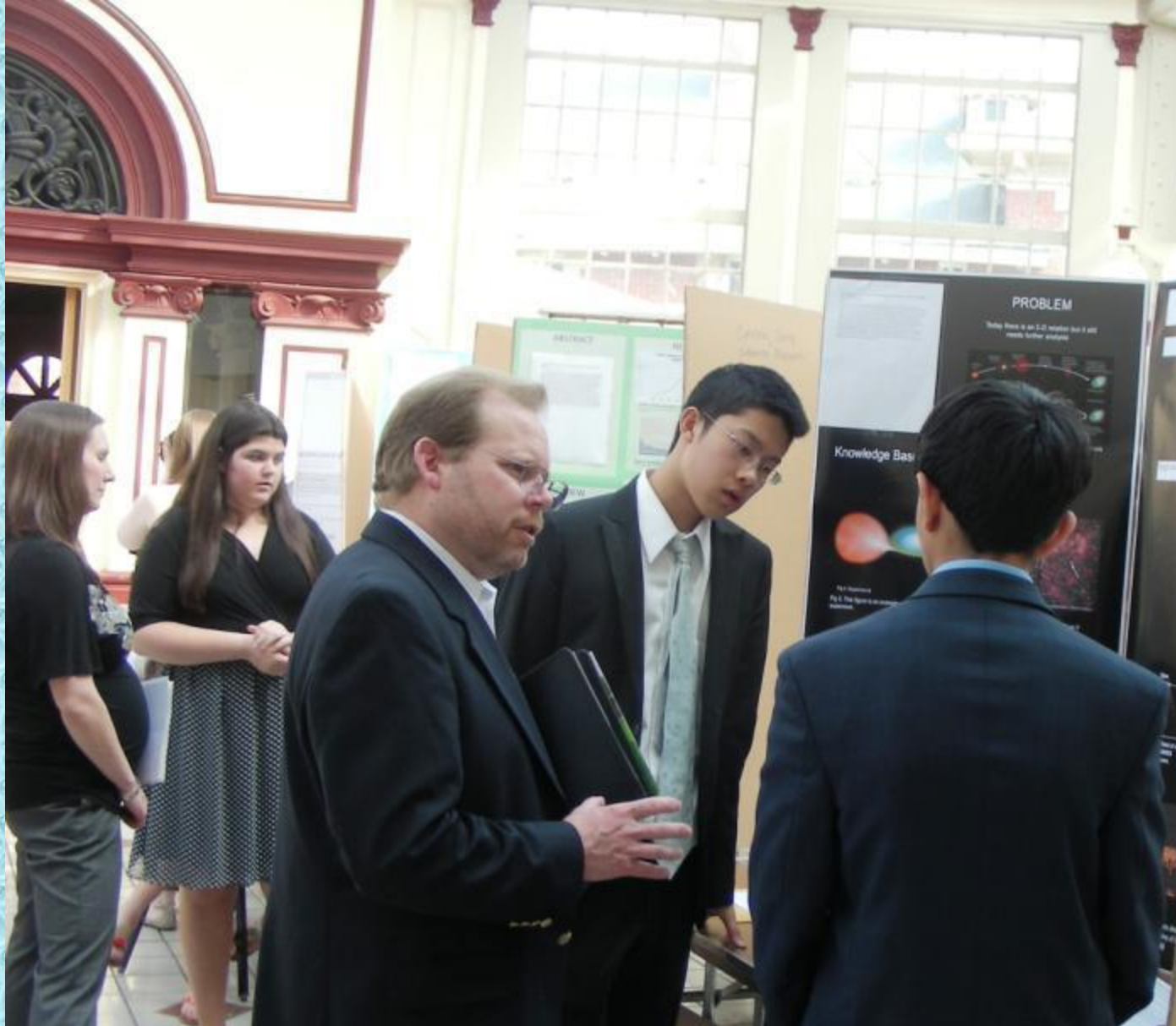
1. American Chemical Society. *Chemical Abstracts*. 1990. The effects of copper (II) sulfate on the growth and survival of *Artemia salina*. *Chemical Abstracts*, 119:123456.
2. American Chemical Society. *Chemical Abstracts*. 1991. The effects of copper (II) sulfate on the growth and survival of *Artemia salina*. *Chemical Abstracts*, 120:123456.
3. American Chemical Society. *Chemical Abstracts*. 1992. The effects of copper (II) sulfate on the growth and survival of *Artemia salina*. *Chemical Abstracts*, 121:123456.
4. American Chemical Society. *Chemical Abstracts*. 1993. The effects of copper (II) sulfate on the growth and survival of *Artemia salina*. *Chemical Abstracts*, 122:123456.
5. American Chemical Society. *Chemical Abstracts*. 1994. The effects of copper (II) sulfate on the growth and survival of *Artemia salina*. *Chemical Abstracts*, 123:123456.

Judge Karen Eichelberger looks over project



Captain Don Harris of the environmental group SPLASH looks over the projects prior to giving his workshop presentations





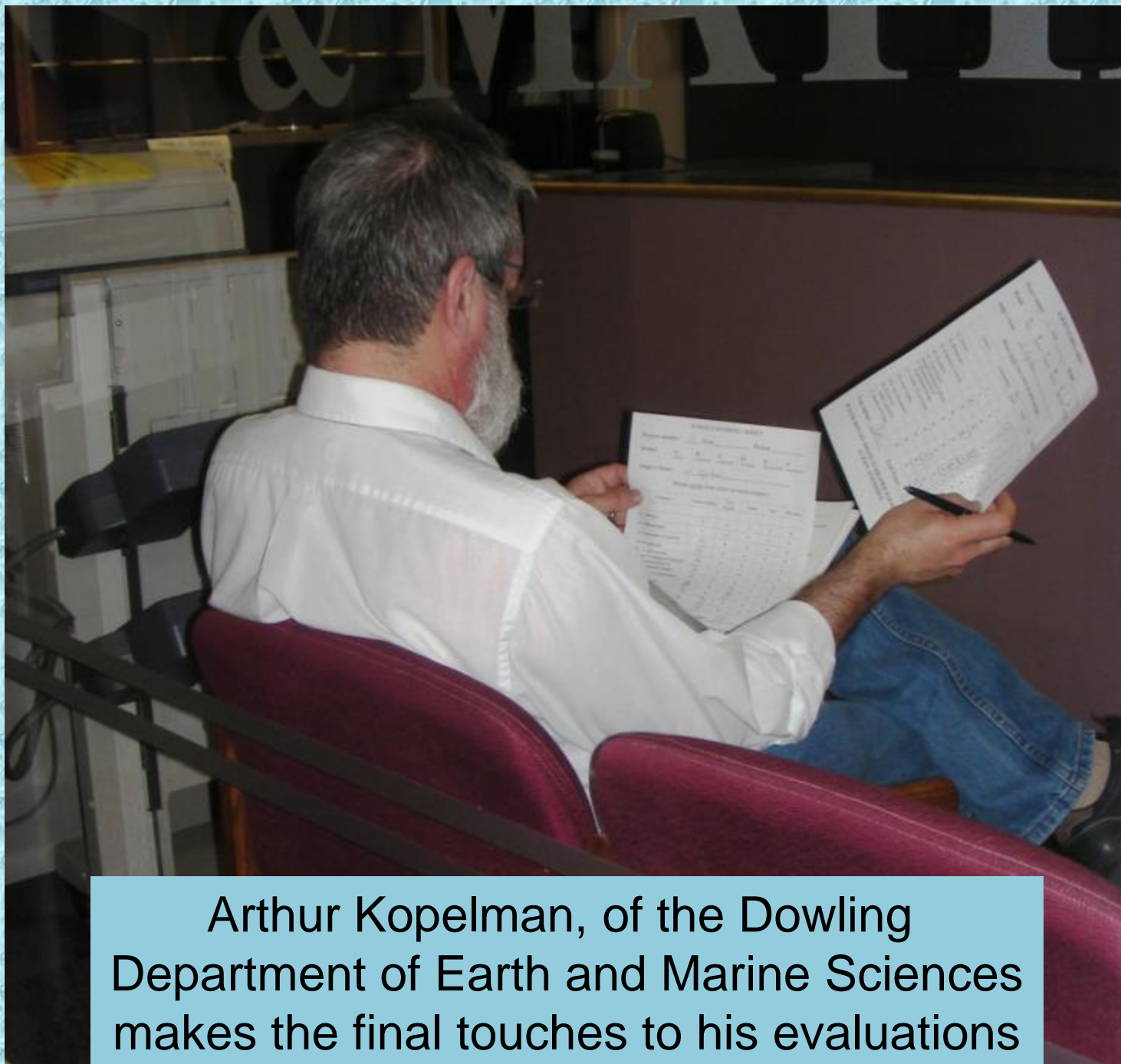
Judge Robert Purdy of West Islip High School interacts with the students



Judges completing their evaluations







Arthur Kopelman, of the Dowling Department of Earth and Marine Sciences makes the final touches to his evaluations





The hardworking judges share a well deserved lunch after a morning of interacting with some great students



Students and judges took advantage of the great weather to explore the unique waterfront campus of Dowling College





Meanwhile the committee of NOYCE Scholars and faculty members compiled the judges forms and determined the winners in the various categories

15 workshop presenters shared their knowledge and experiences with the students.



Doug Schmid, of western suffolk BOCES and Nassau Community College shared his experiences with albatrosses and other organisms during his recent visit to the Pacific Island, Midway





C. Chris Peters, founder of “Music Meets Science” explores sound using a harmonograph instrument during his workshop



John Tanacredi, Chair of Dowling's Department of Earth and Marine Sciences and Director of the CEECOM waterfront research center discusses the efforts to track the population and movements of the ancient animal on our shores the horseshoe crab.





Lisa Breslof, of the American Museum of Natural History and a NYSMEA Board member talks about and shows how to preserve seaweeds

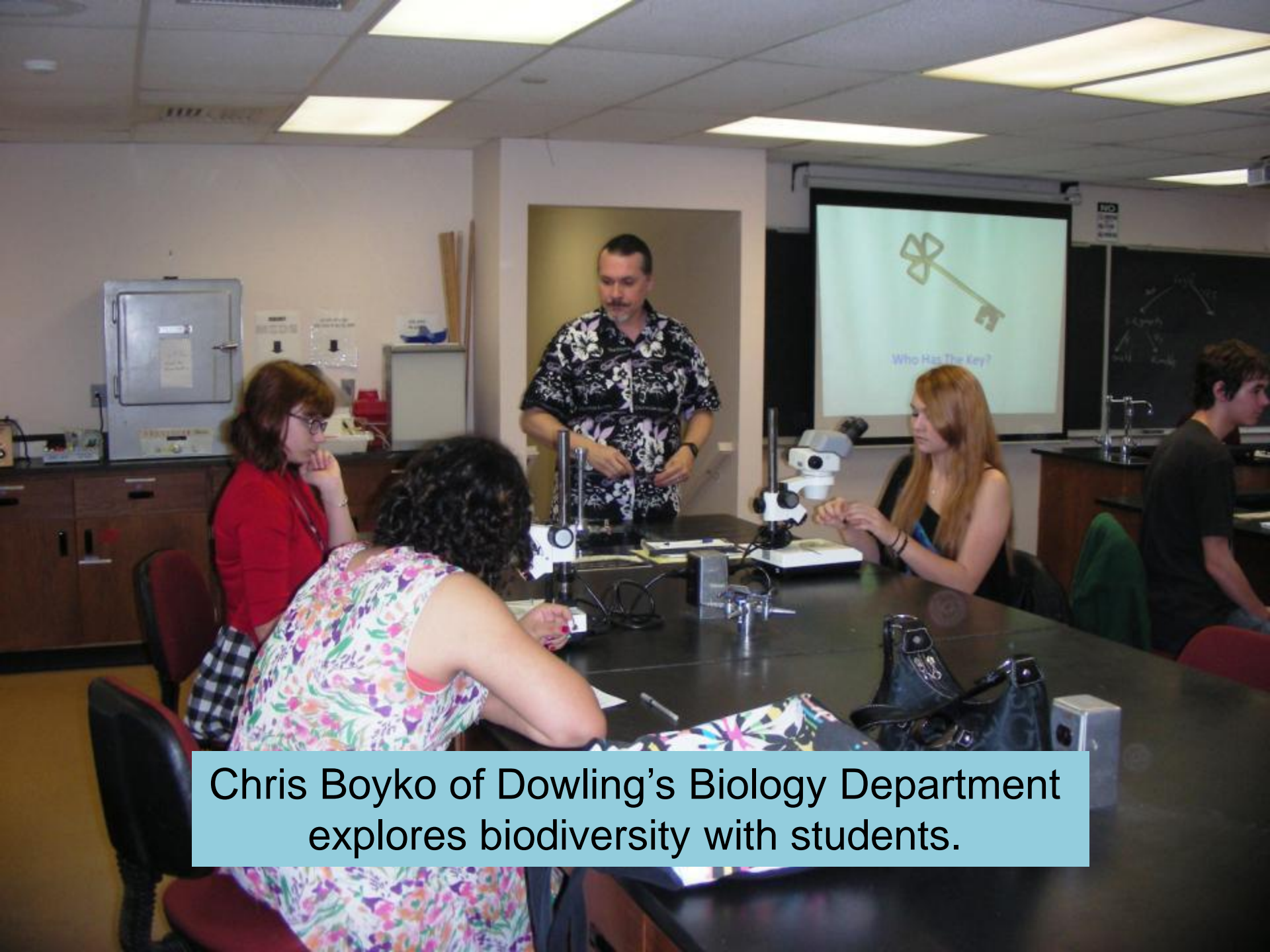


Merryl Kafka, Education Director of the New York Aquarium (retired,) and NYSMEA Board member explores Fish!



Ed Jameson, traveled down from Massachusetts to share his unique underwater 3D presentation





Chris Boyko of Dowling's Biology Department explores biodiversity with students.





Richard Wilkens of Dowling's Biology Department discusses variations in local *Lepidoptera* species



David Stolarz of the Earth and Environmental Program at the CUNY Graduate Center and a NYSMEA Board member discusses “Earning Higher Grades using Informative Maps”



Joanne DiNovis, of Dowling's Chemistry Department explores the use of spectrophotometers with workshop students





Jane Montague Jackson of the North Shore Land Alliance discusses invasive plants on Long Island





Captain Don Harris of the group, SPLASH discusses environmental stewardship



Joseph Rezza Jr. (NOYCE Scholar,) of the Islip Public schools describes his adventures hunting for dinosaurs with the Marmarth Research Foundation





Thomas Vitti of West Islip High School and the Long Island Beekeepers Club explores beehives with students



Minyi Hu of Stony Brook University discusses bone physiology



Richard Ellis, author, artist and environmentalist discusses the history and present status of the tuna fishery and the general state of ocean ecology



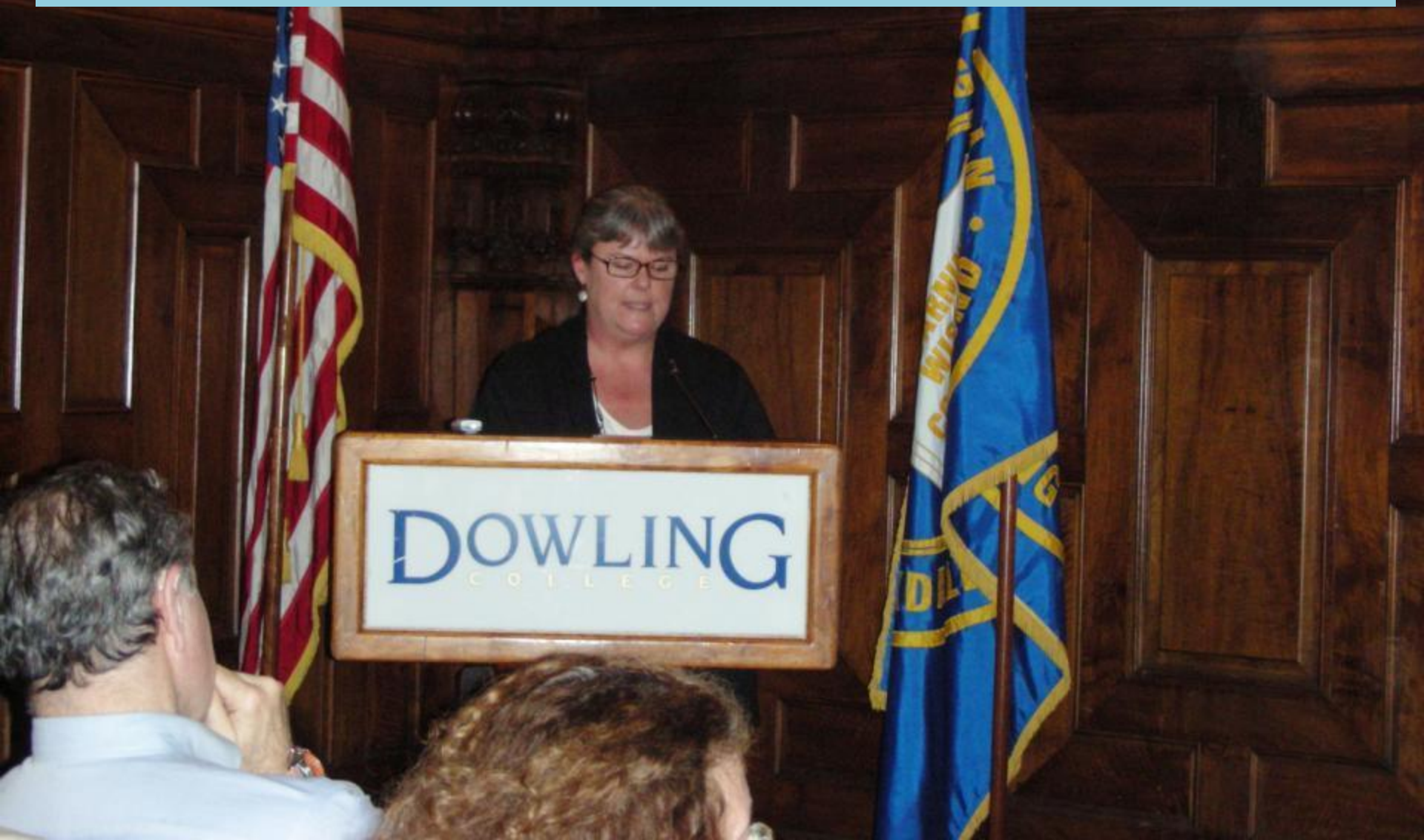




Dowling President Brown greeted the group  
for the awards ceremony



Sarah Richards, Marine Science Teacher at St. Anne's school, Brooklyn, N.Y. and NYSMEA Board member accepting the 2012 Dowling Outstanding Educator Award





Sarah Richards, 2012 Dowling Outstanding Educator Awardee,  
Richard Ellis, author, artist and environmentalist,  
Lou Siegel, Dowling Adjunct Professor, Department of  
Earth and Marine Sciences and a conference organizer





Some of the winners accepting their awards



Teacher advisors accepting the school awards





A good time was had by all!  
For more information  
about Dowling go to [www.dowling.edu](http://www.dowling.edu)  
about NYSMEA go to [www.nysmea.org](http://www.nysmea.org)  
[NOYCE 2012 Program](#)