

# **GILCOMPO**

The **G**lobal **I**nteractive **L**earning  
through  
**C**limate **O**bservation by **M**any  
**P**eople **O**rganizational

# Connecting HS Students to the World Through Science Research

Atmospheric Reconstructions over the Earth (ACRE) 3<sup>rd</sup>  
Workshop on Reanalysis and Applications

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# ***Motivation***

Commack High School

Part of

MISSION STATEMENT

Acquire the necessary knowledge, skills, attitudes, and values to become a successful, contributing member within our school community and greater society.

# Familiar Place of Learning



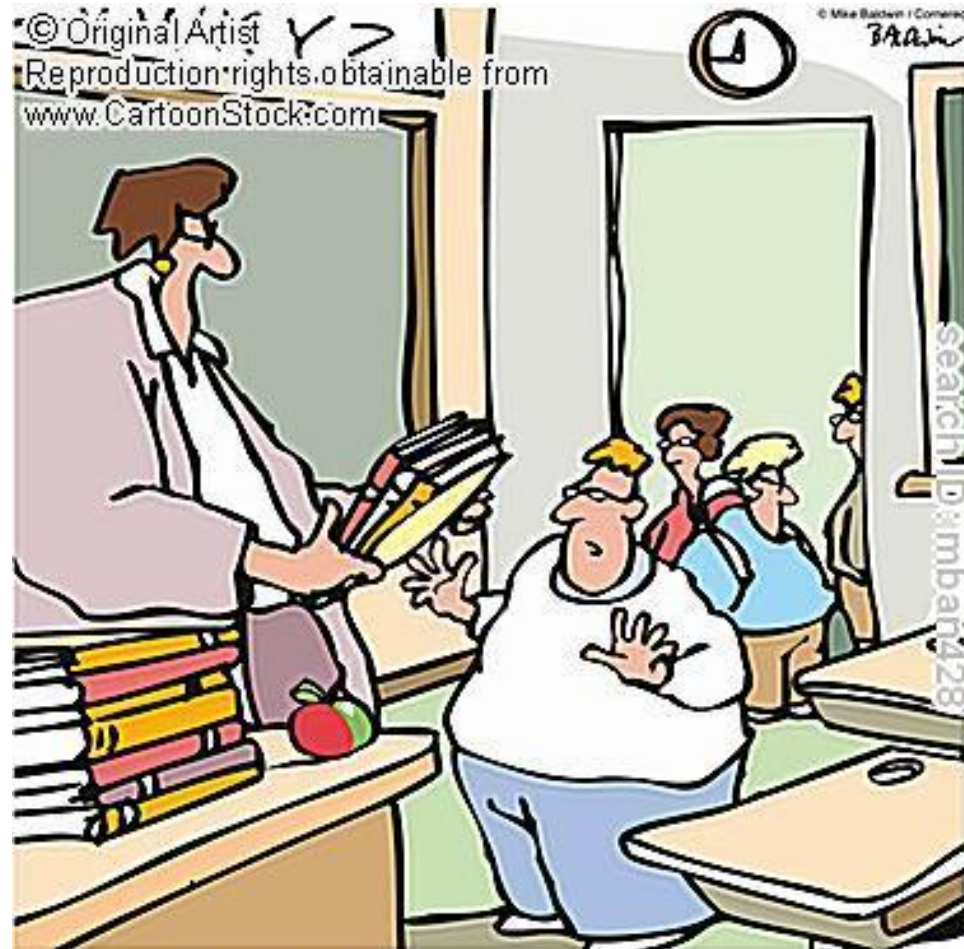
Ohio Historical Society

# Familiar Place of Learning



# The New Classroom Challenges

Students are web savvy, their experiences are reshaping the way in which learning will take place in traditional schools



"No textbooks. I'm strictly Web-fed."

# New Classroom Opportunities



Modern classrooms do not need to have defined boundaries. Students have access to unlimited learning and collaborative opportunities

# Concept

- Classroom can no longer be defined by its 4 walls
- Connect to sources outside the classroom for innovative and authentic science research projects is a role the teacher can play
- Research questions derived from student interest, experience and curiosity are the point of departure from which the Internet can provide access to an amazing array of resources
- At Commack High school our students have contacted science professionals, with mutual research interests, who volunteer to be Internet (Cyber) mentors



# Examples

## Students Working with Mentors

Education

# In Living Color: Bacterial Pigments as an Untapped Resource in the Classroom and Beyond

Louise K. Charkoudian<sup>1</sup>, Jay T. Fitzgerald<sup>1</sup>, Chaitan Khosla<sup>1\*</sup>, Andrea Champlin<sup>2\*</sup>

<sup>1</sup> Stanford University, Stanford, California, United States of America, <sup>2</sup> School of the Museum of Fine Arts, Boston, Massachusetts, United States of America



## Box 1: Concepts at a Glance

### Leads into chemistry, microbiology, and biotechnology

- Chemical composition of paint (solubility and states of matter)<sup>\*, †</sup>
- Structures of pigment molecules (electromagnetic radiation, electron configuration, valence bonds, molecular orbital theory)<sup>‡</sup>
- Culturing *Streptomyces* and extracting their pigments (sterile culture techniques, natural product extraction techniques, solubility)<sup>‡</sup>
- Painting *Streptomyces* on agar plates (bacterial growth control)<sup>\*, ‡</sup>
- Engineering bacteria to make new pigments (metabolic engineering of

Hello Richard Kurtz,

**Good to hear that some similar experiments are actually happening in your high school.**



**Your project course sounds interesting and innovative.  
Would you mind telling us a little more about it?**




**I am very interested in continuing to hear about your experiences and ideas.**

**Please keep in touch as your projects develop**

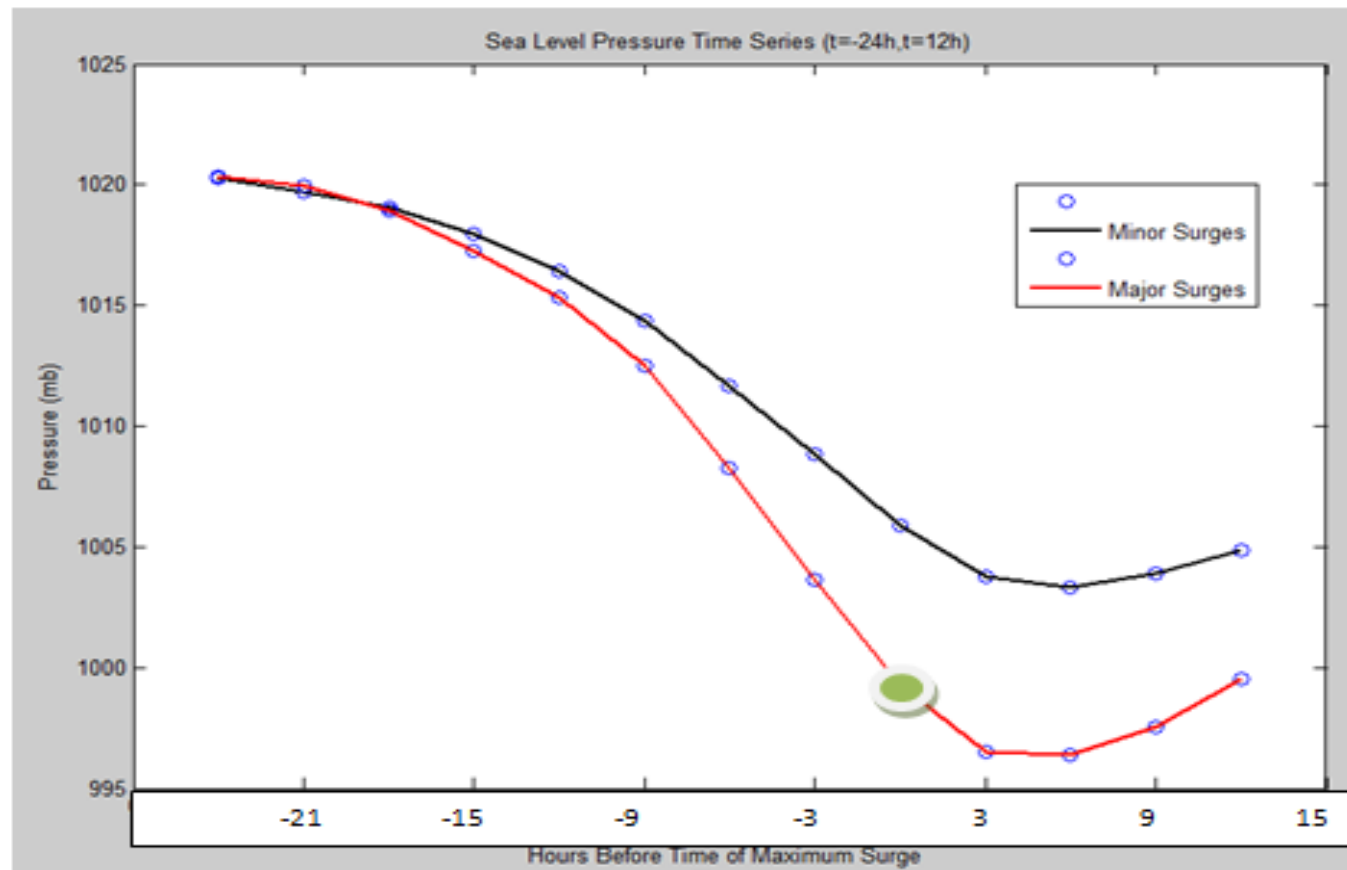


# Communication of Medication Labeling Information: Crossing Cultural and Language Barriers – Pharmacists without Borders

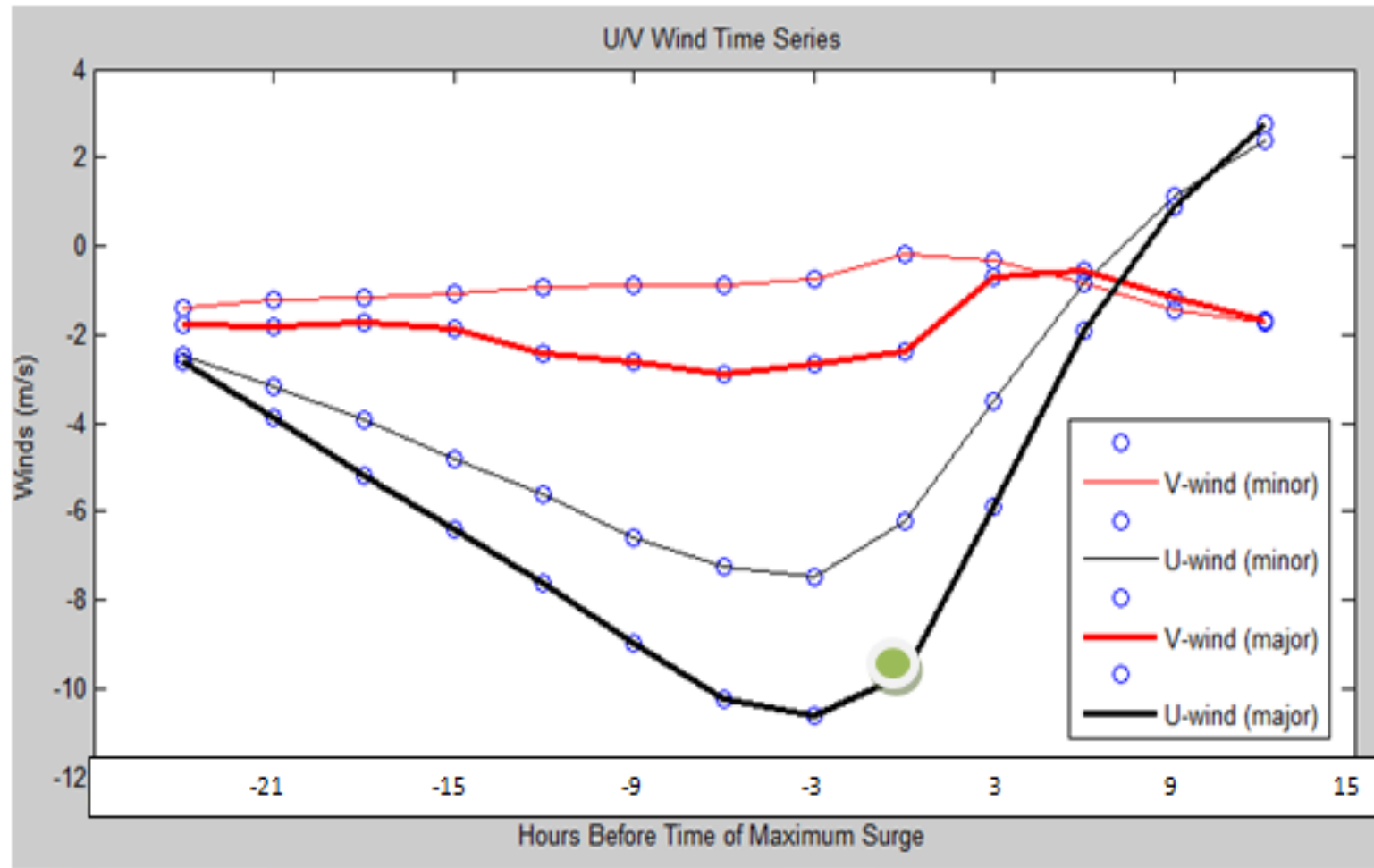
|             |   |             |
|-------------|---|-------------|
| Form        |    | Solid       |
| Quantity    |    | Two         |
| Route       |    | Mouth       |
| Frequency   |   | Twice Daily |
| Precautions |  | No Alcohol  |

|                |  |
|----------------|--|
| Forma          |     |
| Quantità       | 1---UNO  |
| Il Percorso    |     |
| La Frequenza   |    |
| Le Precauzioni |  |

# Storm Surges in the Big Apple: The Effect of Atmospheric Conditions on Storm Surge Frequency and Intensity – SUNY Stony Brook



**Figure 4:** A plot comparing the sea level pressure between moderate and minor storm surges. The green dot represents the time of maximum surge.



**Figure 3:** A plot comparing the average u and v wind values for all time intervals between moderate and minor storm surges.



# A Review of the Process

**Student expresses an interest and begins contact search**

*Applied Math and Actuarial Science*

**Typical Steps in the Development and Implementation of a Student Project**

**Teacher makes initial contacts via e-mail**

*Casualty Actuarial Society*

**Establish a working relationship with mentor**

*Mr. John Buchanan*

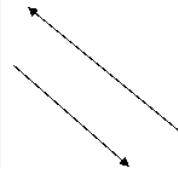
*Climate Change Student Outreach Chairperson for the Casualty Actuarial Society*

**Work with Mentors to plan, implement and complete research project**

*Historical Climate Change Project*

**Establish contacts with others interested in working with students**

*Mr. Gilbert Compo of the Climate Diagnostics Center, NOAA and Eric Freeman, National Climactic Data Center*



# Conclusion

- Collaborative efforts demonstrate the enormous potential impact that scientists can have on the educational experiences of young people.
- Collaborative efforts can lead to career gateways for young people and useful and meaningful research.

# Next Steps

- Increase affiliation and develop working relationships with ACRE US CEDS group
- Teacher-to-teacher collaboration developing projects with students from different schools (National and International levels)
- Modifying and adapting through existing (GLOBE) and new platforms to connect HS Students to the world through Science Research

# Thank you

- Third Atmospheric Circulation Reconstructions over the Earth Workshop (NOAA, NASA, NSF and U.S. CLIVAR)
- Mr. John Buchanan, Climate Change Student Outreach Chairperson for the Casualty Actuarial Society
- Mr. Gilbert Compo, Climate Diagnostics Center NOAA
- Eric Freeman, National Climactic Data Center
- Ms. Marni Wasserman, High School student
- Administration, Faculty and Students, Commack Union Free School District