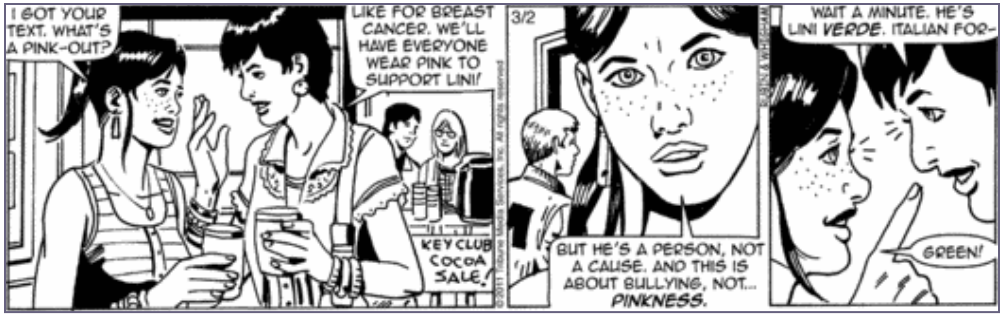
THE GLOBE PROGRAM

CONNECTING THE NEXT GENERATION OF SCIENTISTS

BY

Engaging Students in Scientific Inquiry using Web 2.0 Technologies for Online Learning and Collaboration

COMPELLING FOCUS + APPROPRIATE TECHNOLOGY = ONLINE LEARNING & SOCIAL COLLABORATION

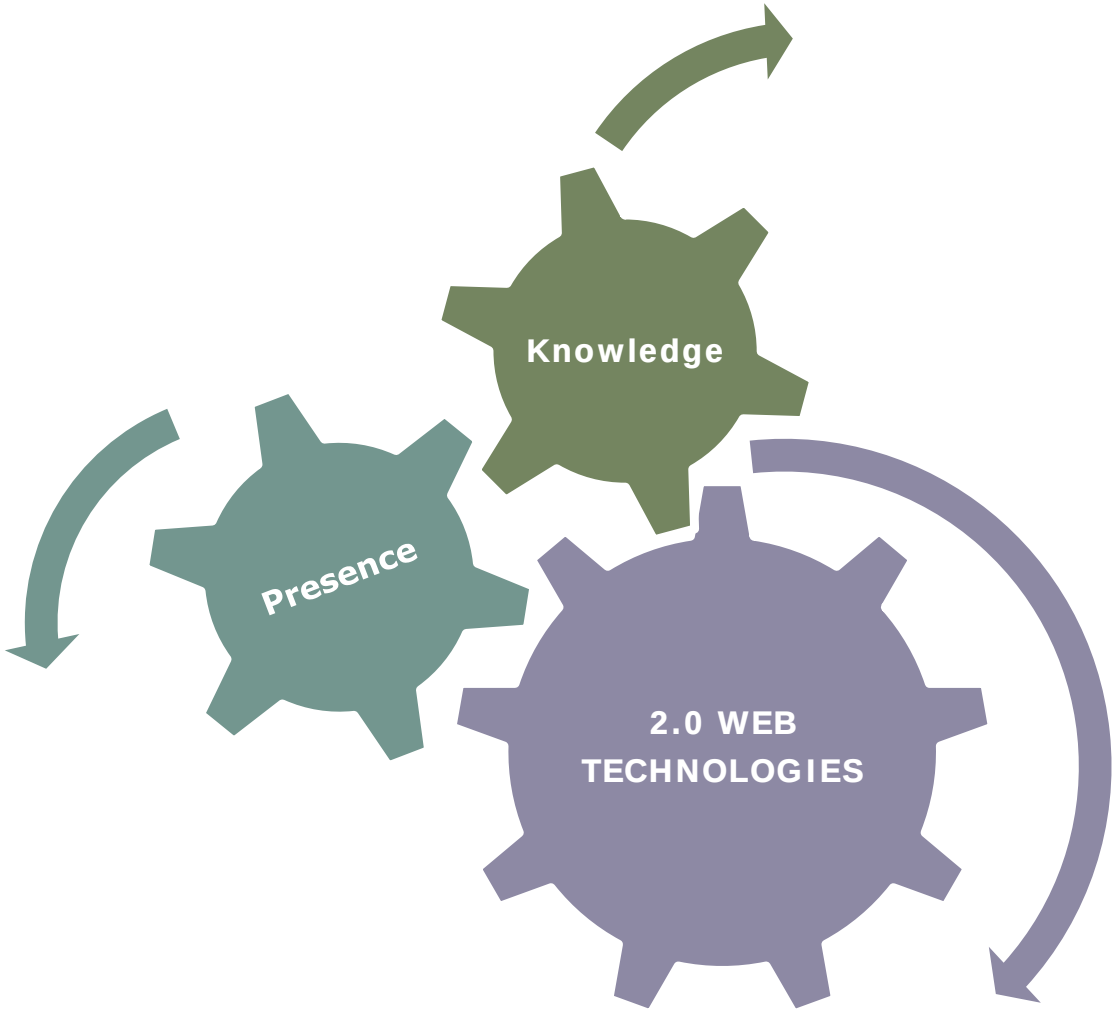


Engaging Students in Scientific Inquiry using Web 2.0 Technologies for Online Learning and Collaboration

Hypothesis:

Students will use 2.0 web technology academically, when they perceived that the work is compelling and the tools fit into work practices.

Design Constructs



Designing for Presence

Social Presence	Cognitive Presence
Social presence is the ability of participants to "present themselves" socially and affectively into the inquiry and the community of practice. ***Who are we?*** ***What is our 'Story of Practice'?*** ***How do I feel about the topic?***	**Cognitive** presence is the capacity for sustained engagement in inquiry resulting in the construction of knowledge; ***What do we already know?*** ***Are we capable?*** ***How can we contribute?*** ***Do we feel supported and our work valued?***
Technology What tools fit the task of identification and introduction of students to an international audience?	**Technology** What tools facilitate continuous engagement with the event scientist and collaborative efforts at knowledge building through facilitated forums and product posts.

Managing The Interplay of knowledge and knowledge- building

Fields of Knowledge	Taxonomy
1) what we know, 2) what is known (public knowledge), 3) new knowledge.	**Data** is the acquired material available within a school, **Information is the meaningful material we acquire from scientists, and other schools, Knowledge** is the transformation of data and information into shared, collectively owned specific knowledge

Scaffolding the Learning through the Technology

Video

Importance of collecting continuous Atmospheric data daily

Identification of precipitation and temperature as key variables in the study of climate

Knowledge of the difference between weather and climate

Webinar

Importance of classifying local climate in the study of climate

Knowledge of how to scale study of weather to study of climate using a 30 yr data set

Knowledge of how to access 30 yr data

Discussion Forum

Student clarification of learning about the difference between weather and climate through statements of learning and inquiry.

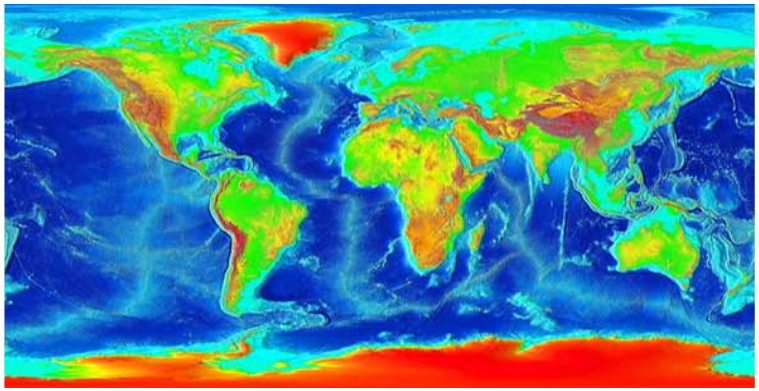
Student understanding of how to study (maybe do research) climate in their school study site or local area through facilitated collaborative inquiry.

FACILITATING THE COLLABORATION

Content Management	Distributed Expertise	Collective Product
Video Webinar Forums	Project Scientist Participant Cohort Resources Activities	Good practice for data collection for weather and climate in local study areas

Begin with a compelling focus

The **Great Global Investigation of Climate** engages students in climate studies and the impacts of climate change through field studies, international discussions with scientists, students, and teachers and collaborative studies.



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Great Global Investigation of Climate (GGIC) Pilot

GGIC Pilot At A Glance

The Great Global Investigation of Climate (GGIC) pilot project provides teachers and students with a suite of new learning activities designed to increase knowledge and understanding of climate science. Additional companion tools, all contained within this website, include online collaboration tools, including structured discussion forums and live webinars; Google Earth browser-based visualizations of climate data; video podcast tutorials; and online PDF document viewers.

Classrooms participating in this GGIC pilot project collect and enter temperature and precipitation data in the GLOBE database and investigate how to classify local climate using these atmospheric data. GGIC participants also interact directly with Dr. Todd Ellis, an atmospheric scientist via webinars and discussion forums. Discussion forums allow each classroom to post the results of their investigations and activities as well as discuss their results and ideas with other classrooms.

In the course of the GGIC students, classrooms, and teachers, collaborate with each other and with the project scientist to investigate how:

- precipitation and temperature data can be used to characterize climate;
- local climate can be classified; and
- local studies of weather can lead to the study of climate.

Directions for Using this Website

This website provides all of the information, resources, and tools needed to participate in and complete the full cycle of GGIC learning activities. Each stage of the GGIC has a

GGIC Teacher Resource Guide

Find all of the background information, instructions, and resources to guide your teaching the GGIC in this guide.

Download a PDF copy of the GGIC Teacher Resource Guide, or click on the icon below to read the document online.

GLOBE Data Entry Portal

Enter your school's temperature and precipitation data into the GLOBE Data

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Roll Call: Story of Practice

What To Do and How To Do It: Write Your School's Story of Scientific Practice

Recommended Completion Date: 14 March 2011

1) Write a short narrative (4-7 statements) entitled "Our Story of Practice."

Discuss how, where, and when you collect data, your data entry practices, as well as how you use your data to find meaning. In the title of your narrative replace "Our" with the name of your school (e.g. Blue Sky Middle School Story of Practice).

Example Story of Practice

Thu, 03/03/2011 - 09:36

GGIC Manager

Online

Joined: 11/05/2010

Blue Sky Middle School Story of Practice--Example Post

The sixth grade class at Blue Sky Middle School in Cleveland, Ohio collects weather data using the GLOBE Atmosphere Protocols: Air temperature, Precipitation, Relative Humidity, and clouds. Our atmosphere site is set up on an open stretch of lawn on the west side of the school. We go out to the Atmosphere Shelter during our fourth period science class so that we are within an hour of solar noon at our site. Each week a new group of four is in charge of data collection and data entry. We intend to take the measurements every day of the school week but sometimes school things come up and we miss a day or two. We probably average 3 measurement days each week. Sometimes we have the data collected but do not have the opportunity to enter the data that day. We do not actually study our data but sometimes there is some out of the ordinary data and one of group tells the class and we talk about it.

2) Post your school's Story of Practice as a New Topic **in the** Our Story of Practice Discussion Forum**.**

GGIC Discussion Forums

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Meet Our Scientist

Meet Our Scientist: Dr. Todd Ellis

GGIC scientist Dr. Todd Ellis, earned his M.S. and Ph.D. at Colorado State University (CSU) in 2005 and 2008. While at CSU he studied the effects of precipitation changes in clouds and atmospheric radiative transfer, i.e. climate change by global warming. He continues his investigation of precipitation while working as the Education and Public Outreach lead for the NASA CloudSat mission. Dr. Ellis is currently an atmospheric scientist at the State University of New York College at Oneonta.

In the video podcast below, Dr. Ellis provides an overview of temperature and precipitation measurements and suggests an investigation to demonstrate the value of using a standardized protocols for data collection.

What To Do and How To Do It: Introduction to Weather and Climate Research by Dr Todd Ellis

Recommended Viewing Dates: 14-21 March 2011

1) Watch Dr. Todd Ellis' 8-minute video podcast introducing weather and climate research.

Stream this video online by clicking the play button in the video window below. Alternatively, download the mp4 video and watch it using your preferred movie viewer (e.g. QuickTime, Real Player, etc.).

2) After viewing the video podcast navigate to the Investigating Weather and Climate Discussion Forum and make a post of your most significant finding.

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Town Hall: Live GGIC Webinar

GGIC Live Webinars

Eastern Hemisphere Webinar: 22 March 2011: 10:00 - 10:30 GMT (06:00 - 06:30 EDT-US)

Western Hemisphere Webinar: 22 March 2011: 18:00 - 18:30 GMT (14:00 - 14:30 EDT-US)

Time Zone Converter

Join Dr. Todd Ellis and other GGIC schools in a live webinar focusing on student investigation of climate. Each of the live webinars allow GLOBE students around the world to communicate directly with Dr. Ellis, and with each other, in real time via an online video and audio webinar tool.

1) Join the live webinars via the following links.

In these webinars, Dr. Ellis will discuss how to view and access 30 year climate data as well as the importance of classifying your local climate.

Eastern Hemisphere Webinar: 22 March 2011: 10:00 - 10:30 GMT (06:00 - 06:30 EDT-US)

Archive of Eastern Hemisphere Webinar (available 24 March)

Western Hemisphere Webinar: 22 March 2011: 18:00 - 18:30 GMT (14:00 - 14:30 EDT-US)

Archive of Western Hemisphere Webinar (available 24 March)

2) After the live webinars ask Dr. Ellis questions and share your ideas about topics discussed during the webinars in the Investigating Weather and Climate Discussion Forum.

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Our Climate

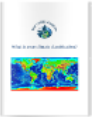
What To Do and How To Do It: Classify Your Local Climate

Recommended Starting Date: Wednesday 23 March 2011

In this stage of the GGIC you will use NOAA 30 year precipitation and temperature data to classify your local climate according to the Köppen-Geiger Climate Classification system.

1) Download or view the teachers and student handout versions of the Climate Classification Activity guides below. This activity will guide you through the process of classifying your climate.

Climate Classification Activity PDF

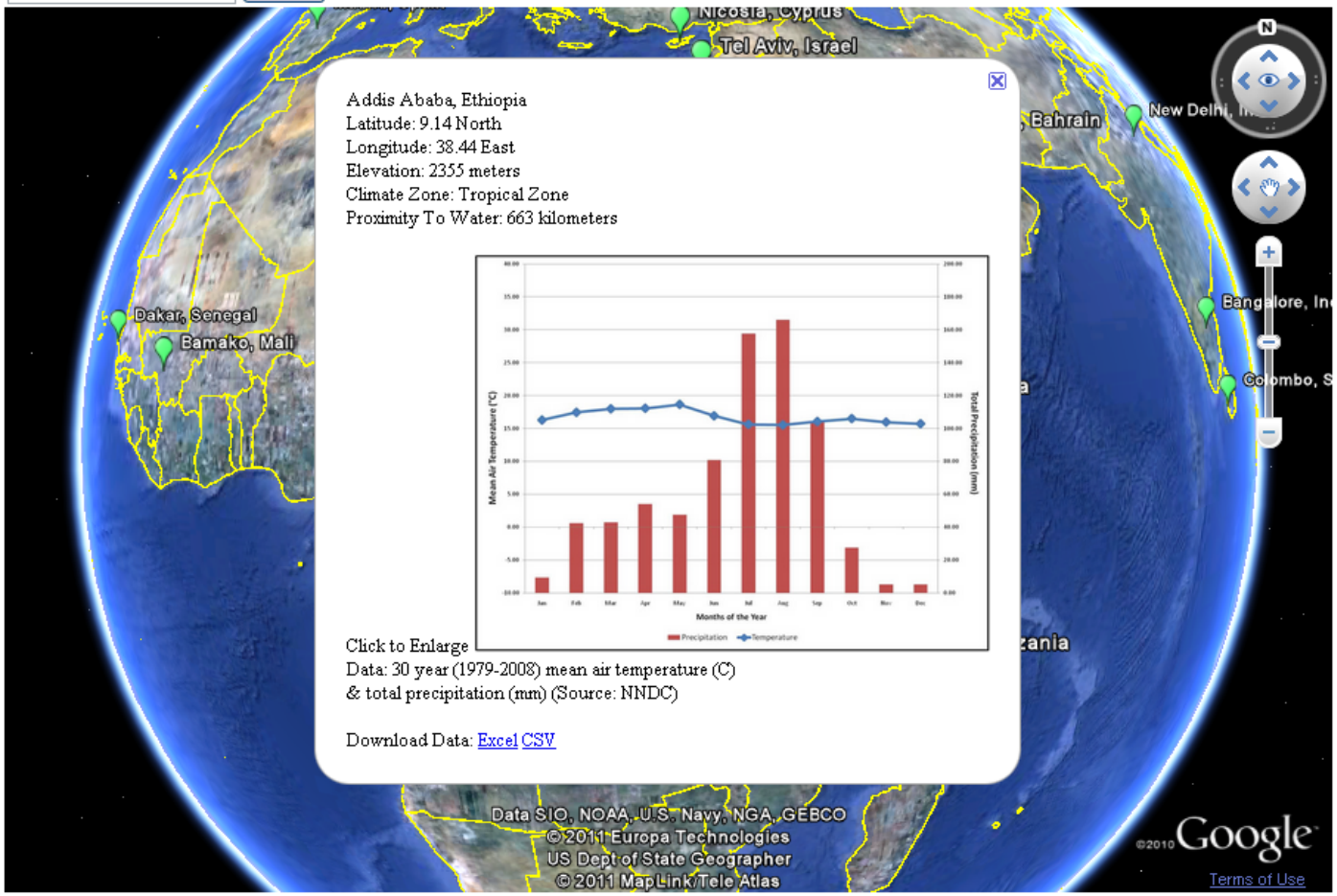


Climate Classification Activity-Student Handout PDF

NOAA 30-Year Climate Data for Selected Cities and Köppen Geiger Climate Classification

The Google Earth viewer below displays 30-year climate data summaries for about 70 cities around the world. Zoom in and click on the green icons to view these climate data. Select the "Show Köppen-Geiger Classification" button to view a color-coded world climate classification map.

Search Map | Search



☐ Show Köppen-Geiger Classification . ☐ Show Great Global Investigation of Climate Participating Schools

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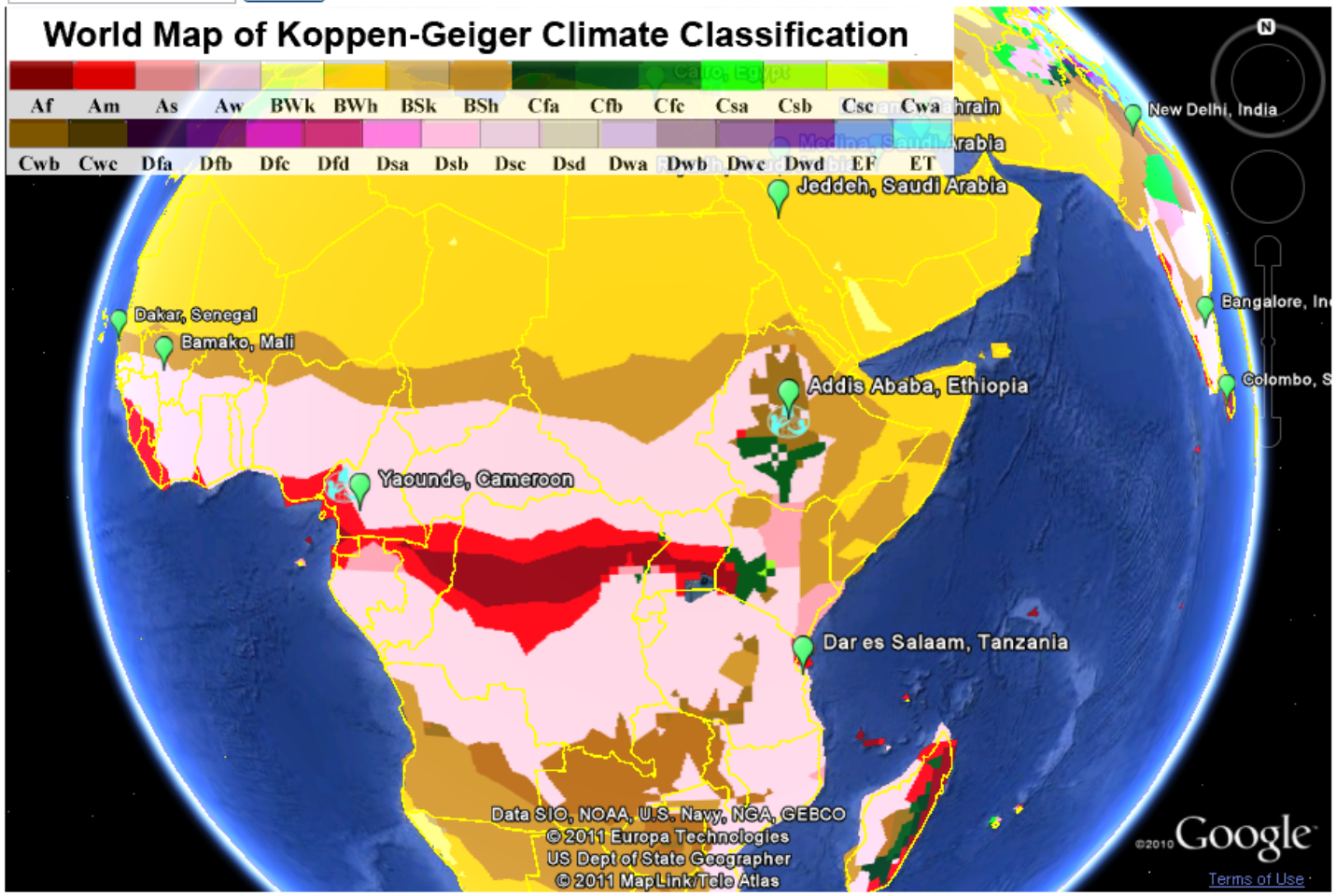

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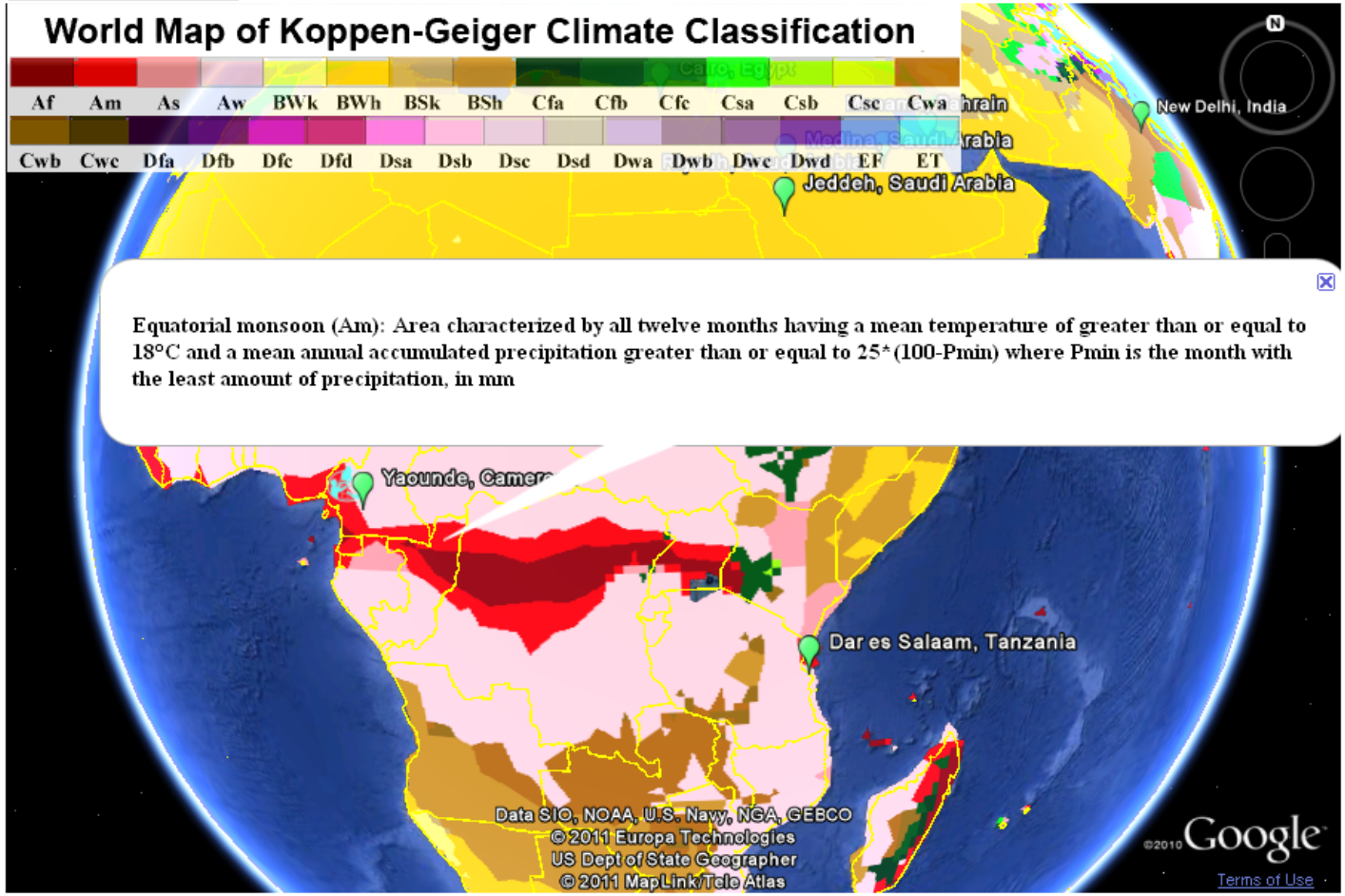

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Wrap Up

What To Do and How To Do It: Wrap-Up

Recommended Starting Date: 28 March 2011

1) Synthesize your knowledge by posting statements in response the following two questions in the Investigating Weather and Climate Discussion Forum.

- How might changes in temperature and precipitation effect your local environment?
- How can your class study climate and monitor climate change at your local site?

Application of New Knowledge

Recommended Starting Date: 28 March 2011

1) Reflect on how you can ensure that your data collection practices can measure climate and climate change in your local environment.

2) Based upon these reflections, amend the "Story of Practice" that you wrote at the start of this Great Global Investigation of Climate.

Return to your school's story of practice in the Our Story of Practice Discussion Forum.

Add a new comment below your original Story of Practice. Focus on how and why your school's practice of data collection, data entry, and approach to analyzing data might change as a result of new awareness and knowledge of atmospheric data as a source of information about weather and climate.

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World Water Day

The 2011 United Nation's World Water Day Campaign aims to present the opportunity for teachers and students to participate in a global effort to raise the awareness of water quality issues on a global scale. The United Nation's World Water Day Campaign aims to educate students about responding to the Urban Challenge and advocating for the sustainable management of freshwater resources.

The objective of World Water Day 2011 is to focus international attention on the impact of rapid urban population growth, industrialization and uncertainties caused by climate change, conflicts and natural disasters on urban water systems. This year theme aims to spotlight and encourage governments, organizations, communities, and individuals to actively engage in addressing the defy of urban water management.

Have You Added Your Event?

People all over the world are organizing events in celebration of World Water Day 2011. Over 80 events have now been posted in the World Water Day Events Map and more are coming in every day. To join or add your own event view the Worldwide Events Map by clicking the image above.

Latest flickr photo from the World Water Day Photostream

Add your community photo to the official World Water Day Photostream. The photo stream now contains over 350 photos from cities across the globe. Do you have any Water for the Cities photos? If so you could add them to World Water Day Photostream by clicking on the image above.

EVALUATION

- How well did the technology work, from a functional perspective? SURVEY
    1. Teacher input
    2. Scientist input

- In what ways did the set of activities (e.g. video, webinar, and discussion forum) enhance students' learning?
    1. Teacher input

- Did the technology enhance the ability to present scientific content and guide student investigation of climate? Why or why not?
    1. Scientist input

- How well is the "flow of learning" facilitated by the technology?
    1. Teacher input based on classroom observation

- What is the value-added of the student-scientist interaction?
    1. Teacher input
    2. Scientist input

- Were the student learning goals achieved?
    1. Teacher administered student assessment

SEE THE RESULTS IN REAL-TIME

Globeprogram.net

GGIC