Mission 2017

GLOBAL WATER SECURITY

BROUGHT TO YOU BY

TERRASCOPE

Terrascope: Social Structure

First year learning community

You will develop friendships and bonds that last for you time at MIT and beyond

Terrascope Room 16-xxx a place to study, hang out, interact, cook, eat, SLEEP,
always someone around to talk to

Terrascope lunches: see calendar—eat, listen (or not), learn

Special activities: movie nights, special dinners, and ideas?

Terrascope: Academic Structure

First Semester

- 12.000: Mission 2017: Solving Complex Problems

Second Semester

- 1.016: Communicating Complex Environmental Issues: Building Solutions and Communicating Ideas
- Terrascope Field Experience (Spring Break)
- Terrascope Radio

Solving Complex Problems

- Multidisciplinary, project-based learning experience
- Students work toward a solution to a deceptively simple problem related to Earth's environment
- Each year's theme is different and referred to as "Mission 20XX", where 20XX refers to the graduation year of the class involved

Solving Complex Problems: Motivation

- To build in you the capacity to tackle “big” problems that confront society
- To encourage you to take charge of the learning process
- To show you how to do independent research, to evaluate the quality of information sources, and to synthesize different information streams

Solving Complex Problems: Motivation

- To encourage you to think about optimal solutions rather than correct solutions
- To help you learn to work effectively as part of a team
- To improve your communication skills: web site and formal oral presentation
- To convince you of your potential!!

Past Missions

- To develop strategies for developing countries in the Pacific basin to cope with tsunami hazards and disasters. Due to the unique needs of each country, we specifically focused on developing plans for Peru and Micronesia.
- To develop a plan for the reconstruction of New Orleans and the management of the Mississippi River and the Gulf coast.

Past Missions

- To develop strategies to deal with the collapse of the global fisheries and the general health of the oceans
- To develop a plan to ensure the availability of fresh clean water for western North America for the next 100 years.
- Propose an integrated global solution to the rapid rise in atmospheric CO_2 that will stabilize concentrations at an economically viable and internationally acceptable level.

Subject Structure

- Problem divided into 5 or more subtopics and students divide into teams
- Each team assigned a Undergraduate Teaching Fellow and Alumni Mentors and have access to the library staff
- Each team will be responsible articulating the nature of the problem and developing a range of strategies and options to deal with it
- Teams are a starting point—you control their survival

Subject Deliverables

- Each team will communicate through wiki-based structure
- The entire class will describe and justify its overall plan in a comprehensive web site
- Each class explains the design in a sixty to ninety minute presentation before a panel of experts and a general audience. Presentation will be webcast around the world
- "The whole world is watching, the whole world is watching….."

Mission 2010

Mission 2012

Mission 2013

Home Page

"A nation that fails to plan intelligently for the development and protection of its precious waters will be condemned to wither because of its shortsightedness. The hard lessons of history are clear, written on the deserted sands and ruins of once proud civilizations."

-Lyndon B. Johnson (1908-1973) 36th President of the United States,
Letter to the President of the Senate and to the Speaker of the House
Transmitting an Assessment of the Nation's Water Resources, 18 Nov 1968

Purpose

As the next generation of scientists and engineers, we are faced with the repercussions of enormous environmental exploitations throughout the last century. As we struggle to protect the Earth from global warming, seek to find alternative sources of energy to replace our diminishing supply of fossil fuels, and race to rescue the global economy, we cannot forget that our most precious resource, water, is being depleted at an alarming rate. The threat of an impending water crisis affects all individuals around the world and must be addressed immediately. It is our responsibility to plan now for the conservation of the current fresh water supply and seek new sources of water for the future. We need to find a sustainable solution that will save the global population from a massive water crisis and can be sustained for many years to come. Moreover, we must first address this crisis at home, in the arid region of western North America.

Mission 2014

Background

According to the definition given at the 1996 World Food Summit, "Food Security exists when all the people, at all times, have the physical and economic access to sufficient, safe, nutritious food for a healthy and active life" (Burchi p. 7). To those of us in the Western World, the idea may sound basic, but in reality, the world is still far from achieving this goal. In 2010, it is estimated that 925 million people (Silbrain) worldwide remain undernourished, a truly alarming number considering that it represents one seventh of the world's population - more than the population of the United States, Canada, and the European Union combined (WFP 2010). Hunger and malnutrition, the most basic forms of human suffering, remain the world's greatest health risk, affecting more people than AIDS, malaria, and tuberculosis combined (WFP 2010).

FIGURE 1

Number of undernourished people in the world, 1969–71 to 2010

“What I have learned is that passion, along with curiosity, drives science. Passion is the mysterious force behind nearly every scientific breakthrough. Perhaps it’s because without it you might never be able to tolerate the huge amount of hard work and frustration that scientific discovery entails….”

“For the next four years you will get to poke around the corridors of your college, listen to any lecture you choose, work in a lab. The field of science you fall in love with may be so new it doesn’t even have a name yet. You may be the person who constructs a new biological species, or figures out how to stop global warming, or aging. Maybe you’ll discover life on another planet. My advice to you is this: Don’t settle for anything less.”

Nancy Hopkins, a professor of biology at M.I.T., has been teaching since 1973.

Extracted from OP-ED contribution in New York Times, September 5 2009

Important Contacts

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(Library staff)

Daniel Sheehan (dsheehan@mit.edu)
(GIS specialist)

Ari Epstein (awe@alum.mit.edu)
(Terrascope staff and Terrascope Radio)

Debra Aczel (daczel@mit.edu)
(Terrascope Administrator)

Sam Bowring (sbowring@mit.edu)
(Terrascope Director)

Field Trip
March 21-29th 2014

Field Trip
March 21-29th 2014

- In conjunction with Nelson Mandela Metropolitan University, Port Elizabeth, South Africa

- A trip to explore the water security issues and the cultures of South Africa

MEET THE UTFs

Come on down!!

Dirk Stahlecker

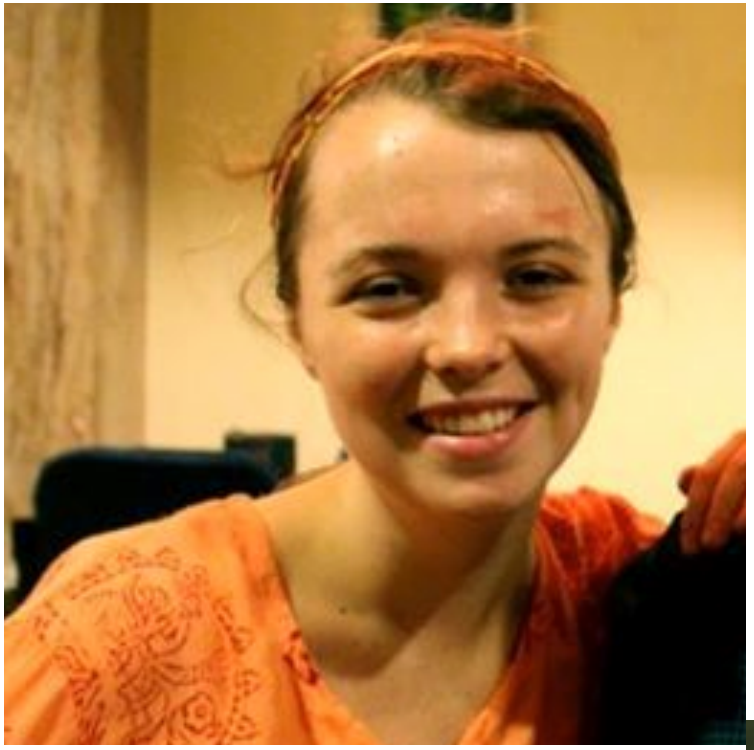
Linda Seymour

Julia Longmate

Jaya Narain

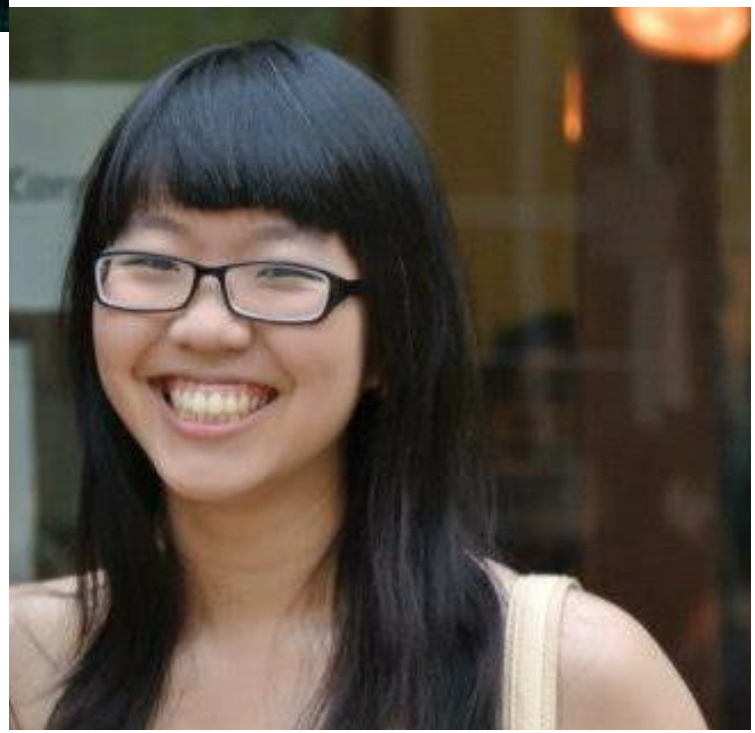
Laura Standley

Heather Sweeney



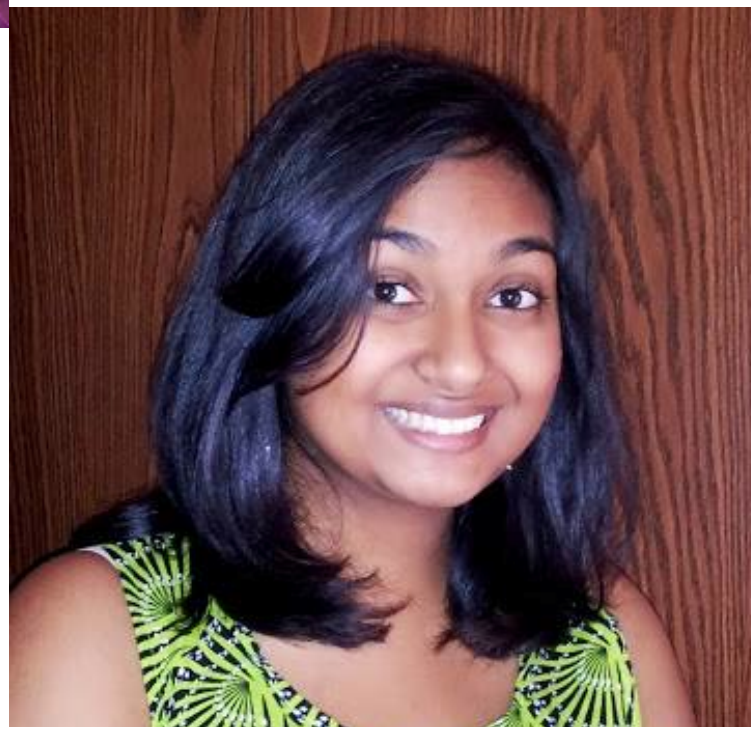
Anna Walsh

Lealia Xiong



Jessica Fujimori

Sabina Maddila



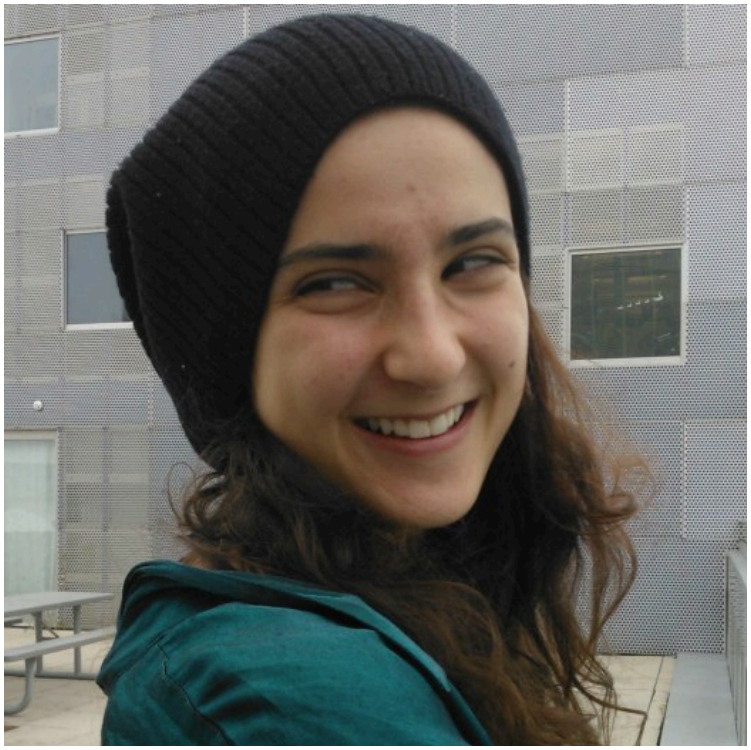
Judy Pu

Patience Stevens

Ana Vazquez

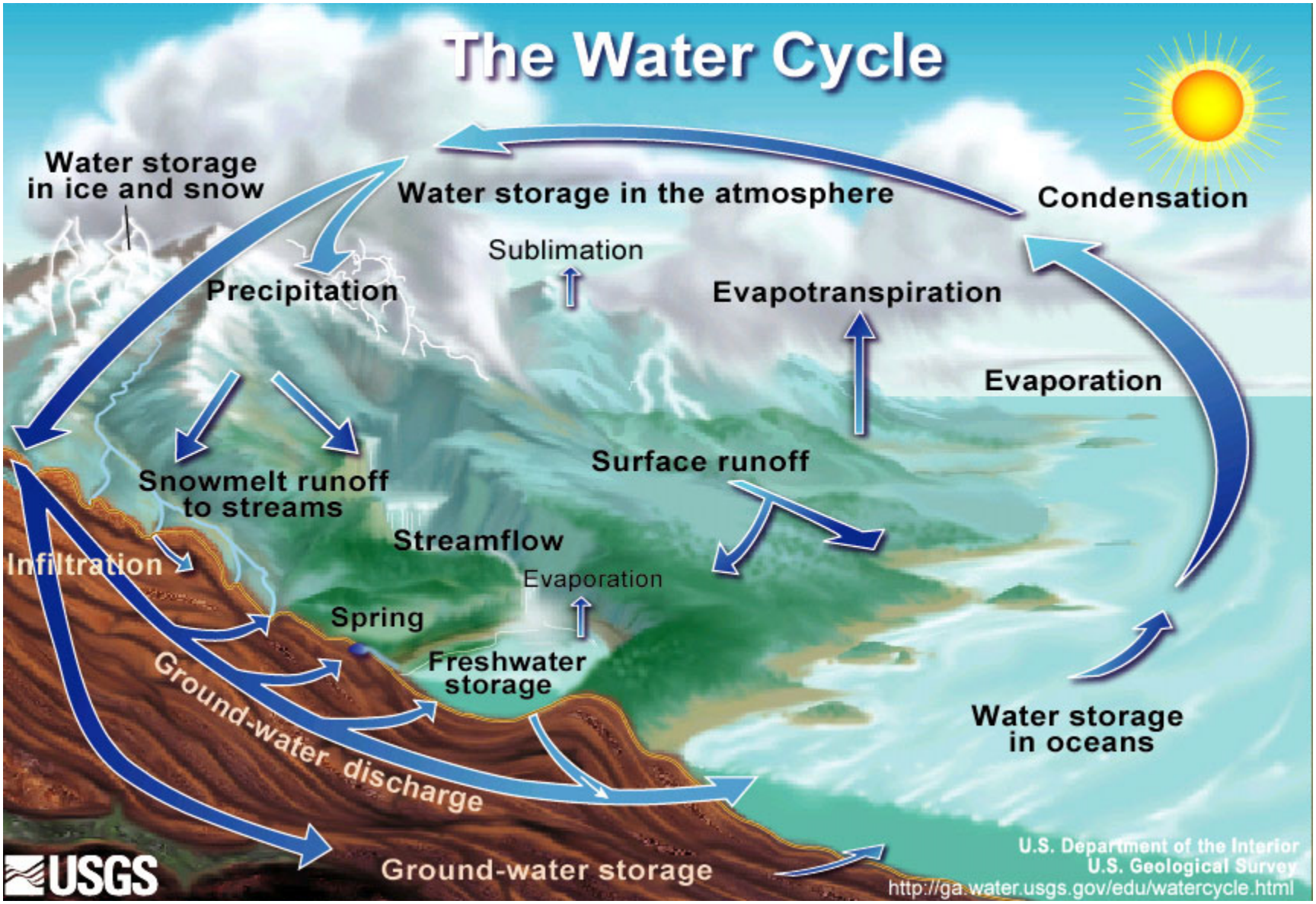
Holly Josephs

Rin Yunis



Your Mission is to....

Your Mission is to devise and plan the implementation of bold new strategies to ensure that all nations — including those considered to be underdeveloped — have access to clean fresh water while preserving fresh water ecosystems. Your plan should include incentives to get people to act on your solutions. This issue cannot be ignored and quite simply, the future of humankind hangs in the balance.



http://www.nhn.ou.edu/~jeffery/course/c_energy/energyl/lec004/water_cycle_001.png

"Water is also central to other core economic, social, and political issues such as poverty, health, hunger, environmental sustainability, conflict and economic prosperity. As society seeks to meet demands for goods and services for a growing population, we must improve our understanding of the fundamental science of the hydrological cycle, its links with related global processes, and the role it plays in ecological and societal well-being."

From Gleick et al 2013

First “assignment”

Water security is defined by the UN as the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability.

Re-write this definition and email to sbowring@mit.edu before 2 PM Friday

Second “assignment”

Part A: Read three short papers on “Tragedy of the Commons” on website

Hardin 1968

Kay 1997

Hardin 1998

de Villiers 2012

Come to class on Monday September 9th ready to discuss

QUIZ

Where is class this Friday?

QUIZ

3-270

Be there