

**ASU**<sup>®</sup> SCHOOL *of*  
SUSTAINABILITY

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ARIZONA STATE UNIVERSITY

**[schoolofsustainability.asu.edu](http://schoolofsustainability.asu.edu)**



# First-Ever School of Sustainability in the U.S.A.

sustainability at

ASU

Change Agents

protect our present

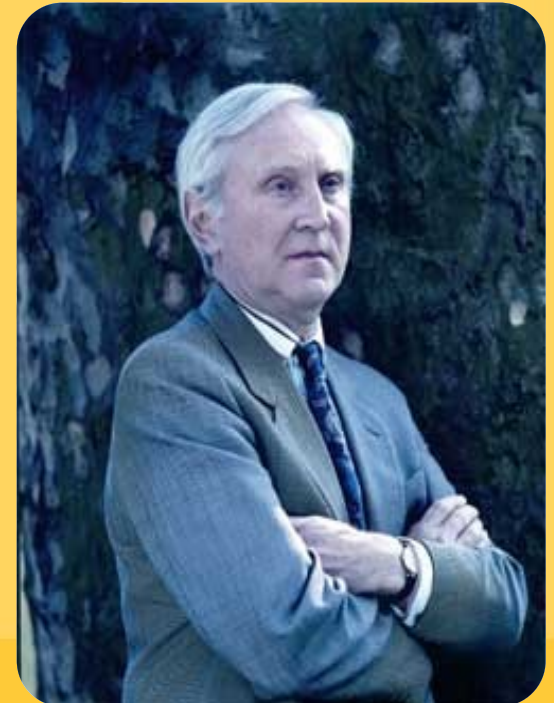
and ensure our future



**Sustainability is  
“Treating the world  
as if we intended to stay”**

**Sir Crispin Tickell**

**People  
Planet  
Profit**



# **SOS students are making a positive impact**

- ✓ **Identify issues that threaten the economy, society, our planet**
- ✓ **Determine stakeholders**
- ✓ **Find solutions**

**“The very world that we depend on is now depending on us for a little bit more care, restoration, and positive transformation of its environment.”** *Dania Lascola, SOS300*

# how do we:

- design healthy **cities**?
- secure **energy** for a growing population?
- ensure clean **water**?
- provide enough **food**?
- promote **sustainable development**?
- understand and impact **social transformation**?
- mitigate and adapt to **climate change**?

05-01-15: Joint study by the *International Center for Tropical Agriculture* and the *CGIAR Research Program on Climate Change, Agriculture and Food Security*:

Coffee is **sensitive to temperature increases**, which **reduce growth** and make it **more susceptible to pests**. With global temperatures forecast to increase by 2C-2.5C over the next few decades, major coffee producing countries will suffer serious losses, **reducing supplies and driving up prices**. Coffee is the key source of revenue for an estimated **25 million farmers in more than 60 tropical countries**.

10-29-14: [www.theguardian.com](http://www.theguardian.com):

**Eight crops we're losing to increased temperatures and water shortages:**

**Corn**

*(and the animals that eat corn)*

**Coffee**

**Chocolate**

**Seafood**

**Maple syrup**

**Beans**

**Cherries**

**Wine grapes**

[www.livescience.com](http://www.livescience.com)

***Rising temperatures are forcing the birth of more female crocodiles and fewer males.***

Crocodile gender is determined by temperature during incubation, only a 0.5 Celcius degree difference.

Warming climates are producing more female hatchlings, which could lead to **eventual extinction of the species.**



*Photo: [www.abc.net.au](http://www.abc.net.au)*

# Climate Refugees: The IPCC estimates that temperatures will rise **3-10 degrees** over the next hundred years

- Water expands as it warms
- Average sea level around the world has already risen 4 to 8 inches in the past 100 years
- Sea levels expected to rise another 19 inches by 2100, causing the **displacement of billions of people and trillions of dollars in property losses**



Sources:

<http://hdgc.epp.cmu.edu/teachersguide/teachersguide.htm>

<http://www.ipcc.ch/index.html>



# SOS110 Sustainable World

The U.S. exports electronic waste (e-waste) to Kenya, India, and China

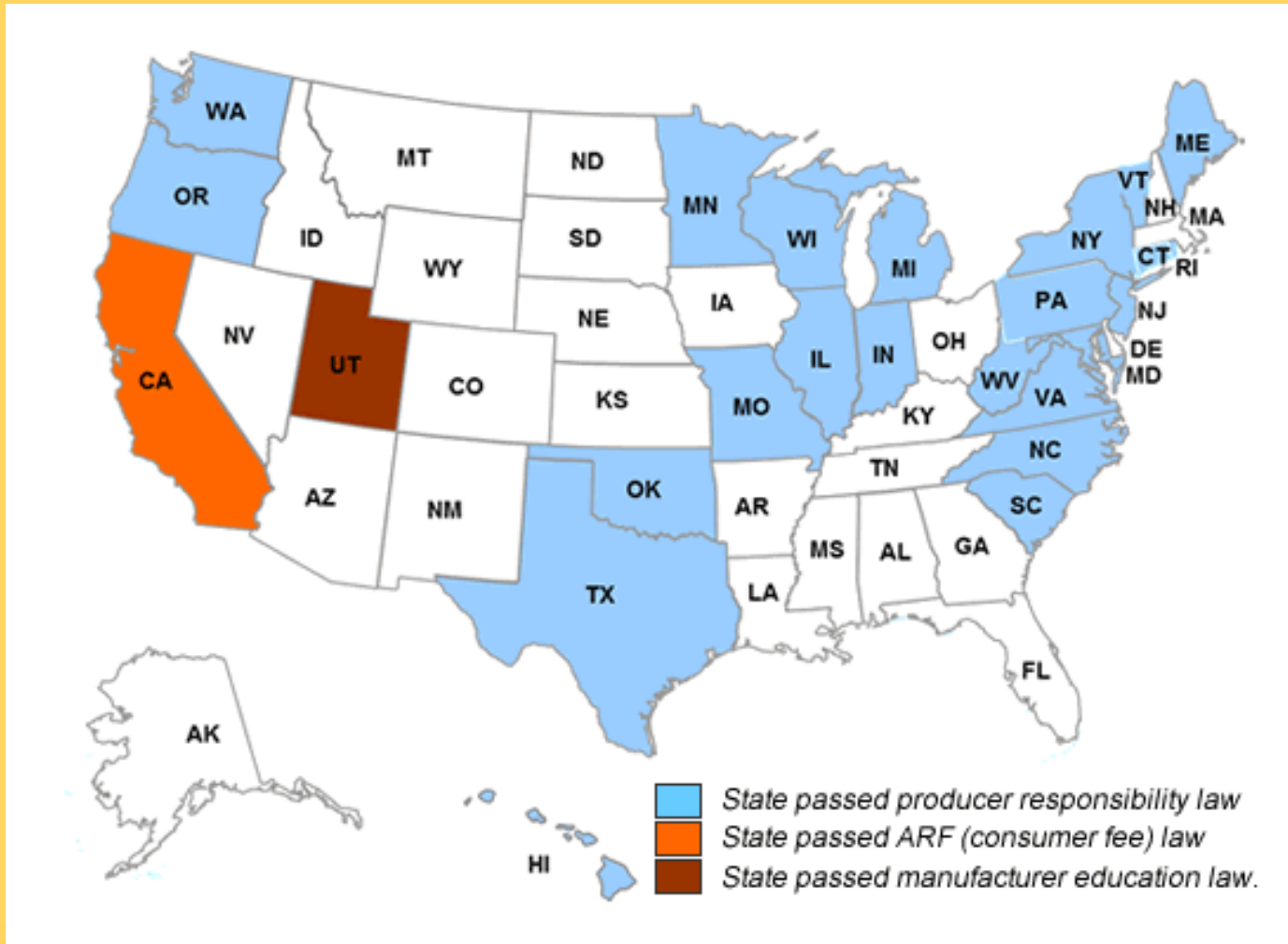
Residents of Guiyu, China, one of the world's largest e-waste sites, have a 68% cancer rate

- Consumerism
- Product Design
- Responsibility / Policy



# Electronic Waste Laws

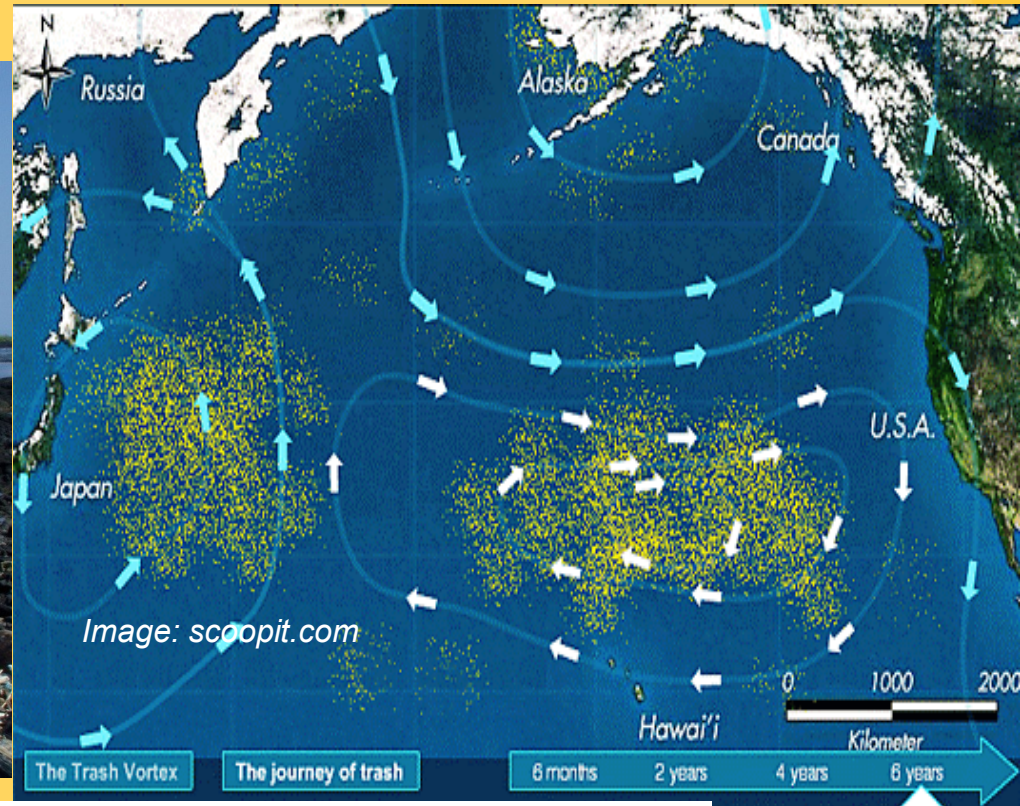
Source: [electronicstakeback.com](http://electronicstakeback.com)



# Plastic Garbage Patches

<http://www.youtube.com/watch?v=tnUjTHB1lvM>

Photo: westhawaii.com



- Eleven large gyres on Earth's oceans
- Pacific gyre: estimated to be twice the size of Texas
- 15 feet deep on average, depths up to 90 feet



*Photo: ecology.com*



*Photo: serc.carleton.edu*

Marine life (our food chain)  
severely affected by trash

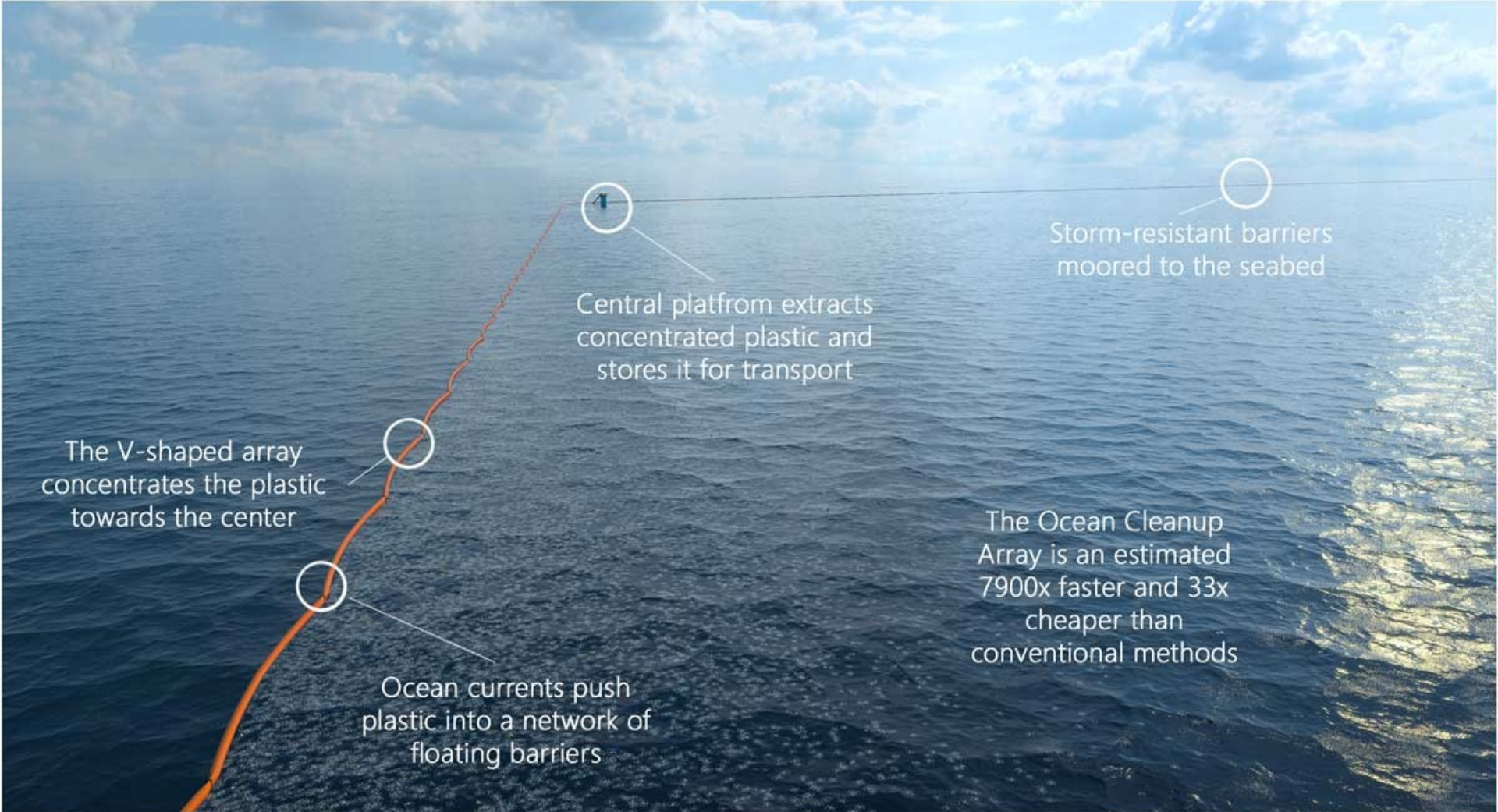
*Photo: flashsparkle.blogspot.com*



# Dutch Boy Mopping Up a Sea of Plastic

- Boyan Slat, born in 1995
- Idea came to him at the age of 16 while diving in Greece
- **"I saw more plastic bags than fish"**
- In just 40 years, millions of tonnes of plastic have entered the oceans
- Slat invented an array of floating barriers, anchored to the sea bed, to catch and concentrate the floating debris





Cheonggyecheon River



# SOS111 Sustainable Cities

Mayor  
Lee Myung-Bak



U.S. Secretary of Agriculture,  
Tom Vilsack, talks to SoS 9-4-14

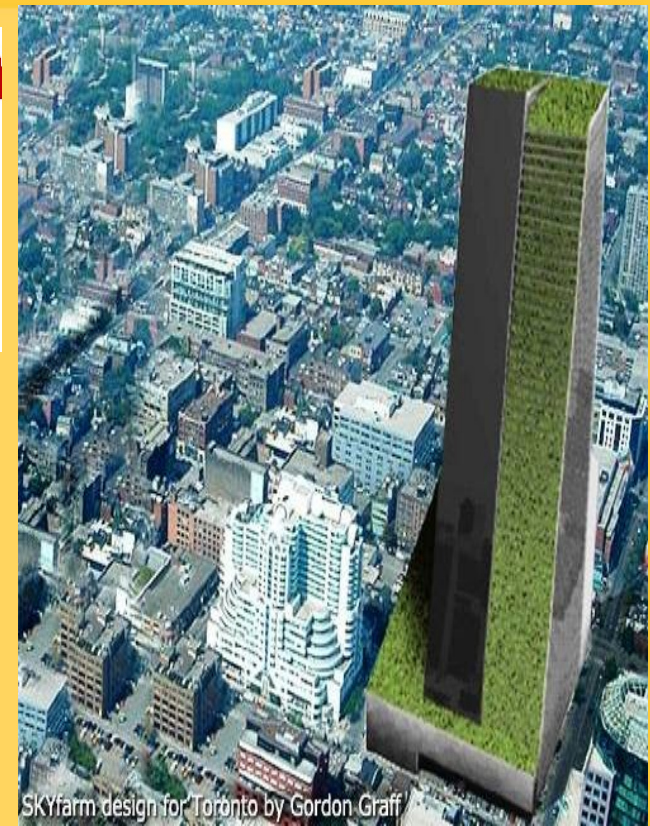


"Nearly **40% of food in the U.S. goes to landfill** .... we are not just wasting food, but also water, energy and resources that were used to grow that food."

"Each year **fewer Americans – less than 1% – claim farming as an occupation...**"



How will we feed **9.6 billion** people, **75%** living in megacities, in **2050**?



SKYfarm design for Toronto by Gordon Graff

*Image: Gordon Graff*

Pasona offices in Tokyo:  
20% of building space  
dedicated to growing fresh  
vegetables

*Photo : Kono Designs*

*Written by an ASU School of Sustainability student regarding  
Overconsumption of Goods in Developed Nations*

**“...This type of differing consumption will not be an easy change for our nation. Yet, the first step can be made in academia. Bridging academia gaps, and understanding that all aspects of life are interrelated is the first step towards progress.**

**Sustainable schools are aiding in this goal by creating transdisciplinary majors.**

**With education our globe can not only envision change but share this image together.”**



# Solutions

**FAVE** *bags*™



- Every year the average person throws away 600 plastic bags
- 25% of litter in storm drains is plastic

# Solutions



Photos: [www.safesipp.org](http://www.safesipp.org)



# **Bachelor of Arts degree**

*\* available in-person or online \**

**Society and Sustainability**

**Policy and Governance in Sustainable Systems**

**International Development and Sustainability**

**Sustainable Urban Dynamics**

# **Bachelor of Science degree**

**Sustainable Energy, Materials, and Technology**

**The Economics of Sustainability**

**Ecosystems Sustainability**

**SOS is  
a small college  
(a family  
atmosphere)  
with the resources  
of a large  
university!**

- **Student Showcases**
- **Free Movies**
- **Free Guest Lectures**
- **Free Field Trips**



# Real-World Learning

Applied / Capstone Experience

Internships

Research Opportunities

Workshops

Service Learning

Field Experience

Study Abroad



*Dr. Christopher Boone, Dean of the School of Sustainability, accepting the Bootstrapper Award for college with highest percentage of student entrepreneurs*

# International Summer Classes



**Dubai  
(United Arab Emirates)**

**Sustainability,  
Tourism and Culture**







# International Summer Classes

**Spain & Morocco**

**Energy, Sustainability  
across the Mediterranean**



# International Summer Classes



**Washington DC & London**  
**Comparing Sustainability**  
**across Cultures and**  
**Governments**



# International Summer Classes

## Ecuador

### Diversity and Sustainability in the Andes



# International Summer Classes for 2016

- **England & France**
- **Morocco**
- **Hong Kong**
- **Nepal**
- **South Africa**
- **United Kingdom & Denmark**



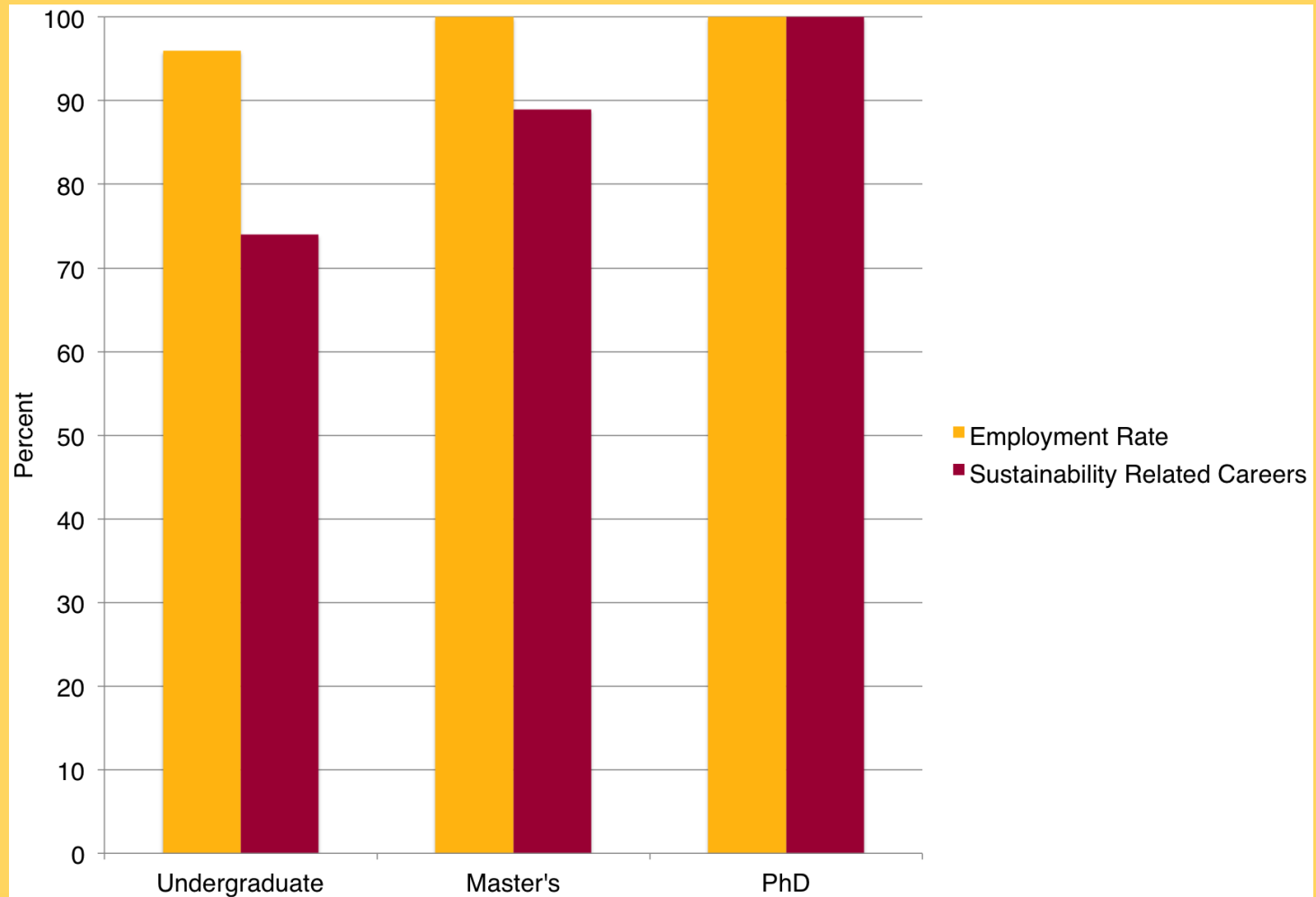
*Image : [earthobservatory.nasa.gov](http://earthobservatory.nasa.gov)*



# Connect the dots

- Create and thrive in a relatively small school with about 500 fellow students
- Impact the world with internships
- Make a difference with **a career you believe in**

# Alumni Employment



# The world's first so the world lasts

Agriculture  
Architecture  
Art  
Auto Industry  
Civic Service  
Consulting  
Corporate  
Design  
Energy  
Fashion  
Field Work  
Global Trade  
Government

Healthcare  
International Aid/Ethics  
Legal  
Marine Biology  
Media  
Policy  
Product Design  
Public Transportation  
Publishing  
Research  
Teaching  
Technology  
Water



alumni

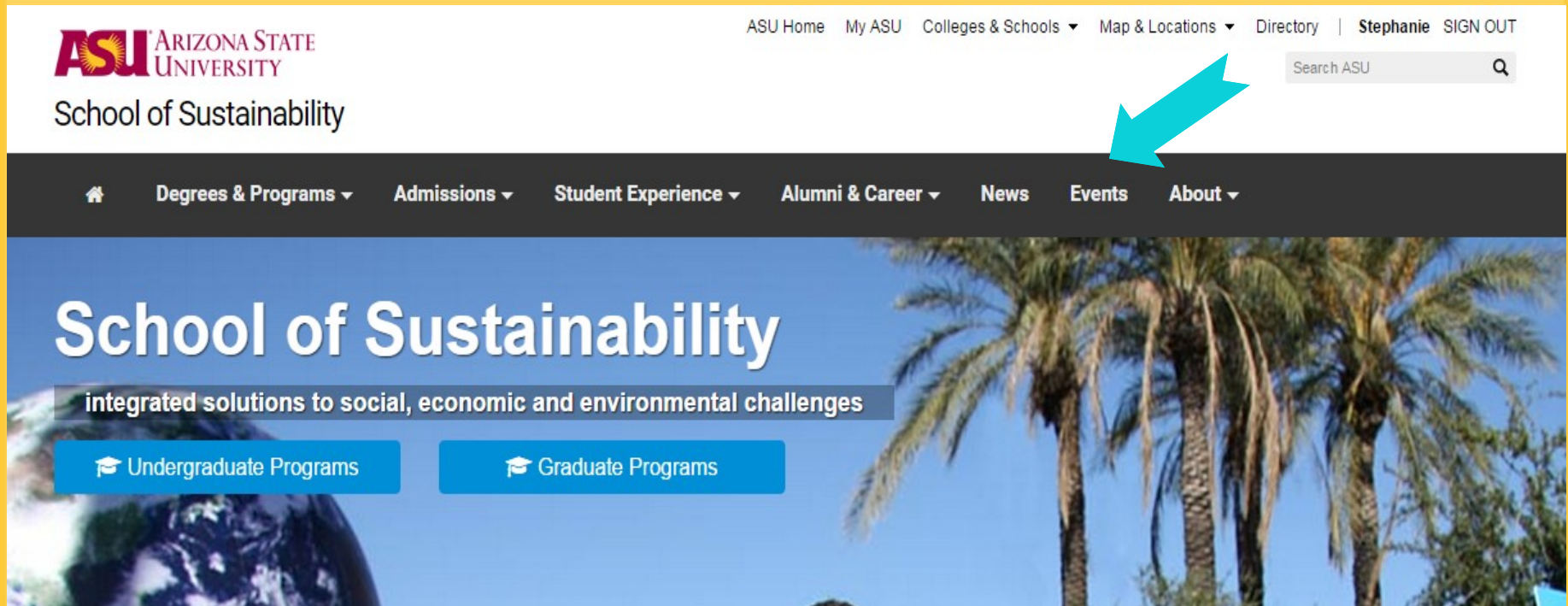
# Making a Difference

- Consulting** (Accenture, Blu Sky Consulting, Green Order, American Global Manufacturing)
- Corporate Sustainability/Corporate Social Responsibility** (Dell, Nike, REI, Coca-Cola, Intel)
- Education** (teaching, research, administration, operations, student affairs)
- Energy** (SRP, APS, FirstSolar, Heliae Development LLC, Abeinsa EPC)
- Entrepreneurship** (Carbon Roots, Ollie the Trolley, Beat Street)
- Event Planning** (Opportunity Green)
- Fashion and Apparel** (Nike, Adidas, American Apparel)
- Food and Agriculture** (Atlasta, Roosevelt Row, EcoScraps, local farmer's markets)
- Marketing/Media** (Greenbiz, Grist, 3BL, earth911, MSM)
- Military** (US Army Corps of Engineers)
- NGO** (Natural Resource Defense Fund, Greenpeace, Environmental Defense Fund)
- Nonprofit** (Phoenix Zoo, Global Reporting Initiative, Sierra Club, Americorps, Peace Corps)
- Non-sustainability jobs in Sustainability Companies** (Dixon, YouChange)
- Policy, Government, Regulatory Agencies** (United Nations, EPA, ADEQ)
- Research and Development** (Argonne National Laboratory, Maplecroft, Globescan)
- Socially Responsible Investing** (Vanguard, Fidelity, Goldman Sachs)
- Stakeholders** (BSR, CERES, Net Impact, etc)
- Standards Organizations** (UL Environment, Fair Trade, Blue Angel)
- Waste and Recycling** (Waste Management, SteriCycle, ADEQ)



# Upcoming Events

Stay up-to-date on upcoming School of Sustainability and Julie Ann Wrigley Global Institute of Sustainability events at <http://schoolofsustainability.asu.edu/events/>



ASU ARIZONA STATE UNIVERSITY

School of Sustainability

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## School of Sustainability

integrated solutions to social, economic and environmental challenges

Undergraduate Programs Graduate Programs

# It's bold to be Gold

| Ranking  |               | Category                                     | Source   |
|--|---------------|--|--|
| #1 in U.S.   | #1 in Arizona | Most Innovative                              | U.S. News & World Report                                     |
| #2 in U.S.   | #1 in Arizona | Best for Veterans                            | College Factual  |
| #5 in U.S.   | #1 in Arizona | Recruiting New Hires                         | Wall Street Journal  |
| #5 in U.S.   | #1 in Arizona | Best Qualified Graduates                     | Wall Street Journal  |
| #6 in U.S.   | #1 in Arizona | Fulbright Scholars                           | The Chronicle of Higher Education                            |
| #7 in U.S.   | #1 in Arizona | "Best Bang for the Buck"                     | Washington Monthly University Rankings                       |
| #8 in U.S.   | #1 in Arizona | Best International Choice                    | International Education                                      |
| #14 in U.S.  | #1 in Arizona | Peace Corps Volunteers                       | Peace Corps Top Colleges & Universities                      |
| Top 22 in U.S. (of 832)                              | #1 in Arizona | 2014 Green Honor Roll<br>Perfect Score of 99 | The Princeton Review   |
| #33 in world   | #1 in Arizona | Patents issued to researchers                | National Academy of Inventors                                |
| #49 in U.S.  | #1 in Arizona | Public Good                                  | Washington Monthly   |
| #79 in world   | #1 in Arizona | Top 100 World Universities                   | Academic Ranking of World Universities                       |
| One of the Top 15% Best Universities in the U.S.     |               |  | The Princeton Review 2014                                    |
| 'Best Buy' Public Colleges                           |               |  | FISKE Guide to Colleges 2015                                 |
| America's Best College Buys                          |               |  | Forbes Investment Report                                     |
| Volunteering, Service Learning, and Civic Engagement |               |  | President's Higher Education<br>Community Service Honor Roll |

*discover and apply knowledge  
to solve global challenges*



**[Brigitte.Bavousett@asu.edu](mailto:Brigitte.Bavousett@asu.edu)**



**Your interests...**

**Your college experience...**

**Your career....**

**School of Sustainability**

**Get into a career you  
feel great about...**

# Geography

**Geographic Information System (GIS) Specialists**  
computer-based mapping

**Coastal Zone Managers** manage environmentally sensitive areas

**Area Specialists**  
study specific countries to help the government set policy



A Chevron oil spill from a leaking well off the Brazilian coast northeast of Rio de Janeiro.

*Photo credit: Brian Hodges*

# Sociology

**Environmental Policy**

**Environmental Law**

**Urban Planner**

**Environmental Communications**

**Participatory Resource Management Specialist**

**Environmental Conflict Mediator**

**Non-governmental Organization Campaign Director**

**Human Dimensions Scientist**

*How do we handle:*

protecting the natural ecosystem; social patterns of natural resource and energy use; impacts of toxic exposure on humans and ecosystems; racism and environmental justice.

Statisticians provide models that help find resources, predict storm surges, understand complex biosystems and forecast weather

Statisticians develop models to predict epidemics and to compare strategies to combat epidemics

# Mathematics and Statistics



Storm surge is a large dome of water, often 50 to 100 miles wide, that sweeps across the coastline where a hurricane makes landfall. The storm tide is the combination of the storm surge and the astronomical tide.

*Graphic credit: newspaper.li*

# Ecology

***Environmental Consultants***  
***Natural Resource Managers***  
***Restoration Ecologists***



*Photo credit: National Geographic*



*Photo credit: post-journal.com*



*Photo credit: Harter Fell*



# Chemical Engineering

**Green chemical engineers design chemical products and processes that reduce or eliminate hazardous substances**

**formulators of green (safer) household products and cosmetics designers of building materials and energy efficient devices**

**developers of new pharmaceuticals**

**chemistry teachers**



**understanding  
environmental beliefs, attitudes  
and values  
the psychology of risk  
appraisal and communication**

**human relations with  
other species**

**quantifying psychological  
benefits people receive  
from green- and open-space  
natural disaster preparedness  
and resilience**

**social marketing**

**assessing the value of  
"ecological services"**

# Psychology



*Image credit: ufi.org*



*Photo credit: theinformedtenant.com*

From developing new vaccines for tropical diseases to finding ways to increase agricultural yields, **biologists are at the forefront of fighting illness and malnutrition**

# Biology

***Park Rangers***

***Zoo Biologists***

***Management And Conservation Biologists***  
***Science Advisors***

Trained professionals study and address the ***economic impacts of biological issues***, such as species extinctions, forest protection, and environmental pollution.



*Photo credit: buzzle.com*



*Photo credit: newspaper.li*



*Photo credit: modcloth.com*

# Geosciences

*Atmospheric Scientists*

*Economic Geologists*

*Environmental Geologists*



**Civil Engineers**

**Mechanical Engineers**

**Electrical Engineers**

**Computer Engineers**

**Biomedical Engineers**

# Engineering



*Image credit: [asulightworks.com](http://asulightworks.com)*

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*Image credit: [cleantechnica.com](http://cleantechnica.com)*



*Photo credit:  
[biomedicalengineeringproject.biz](http://biomedicalengineeringproject.biz)*

# Our Faculty and Our Students

*... are doing amazing things all over the world...*  
**discovering new species in Venezuela**  
**conducting irrigation research in India**  
**lecturing on environmental history in Slovenia**  
**studying sustainable development in Ghana**

SOS Students won Edson Student Entrepreneur Initiative's  
**Bootstrapper Award**

Graduate Student Lt. Col. (retired) Joe Knott honored as  
**White House Champion of Change**

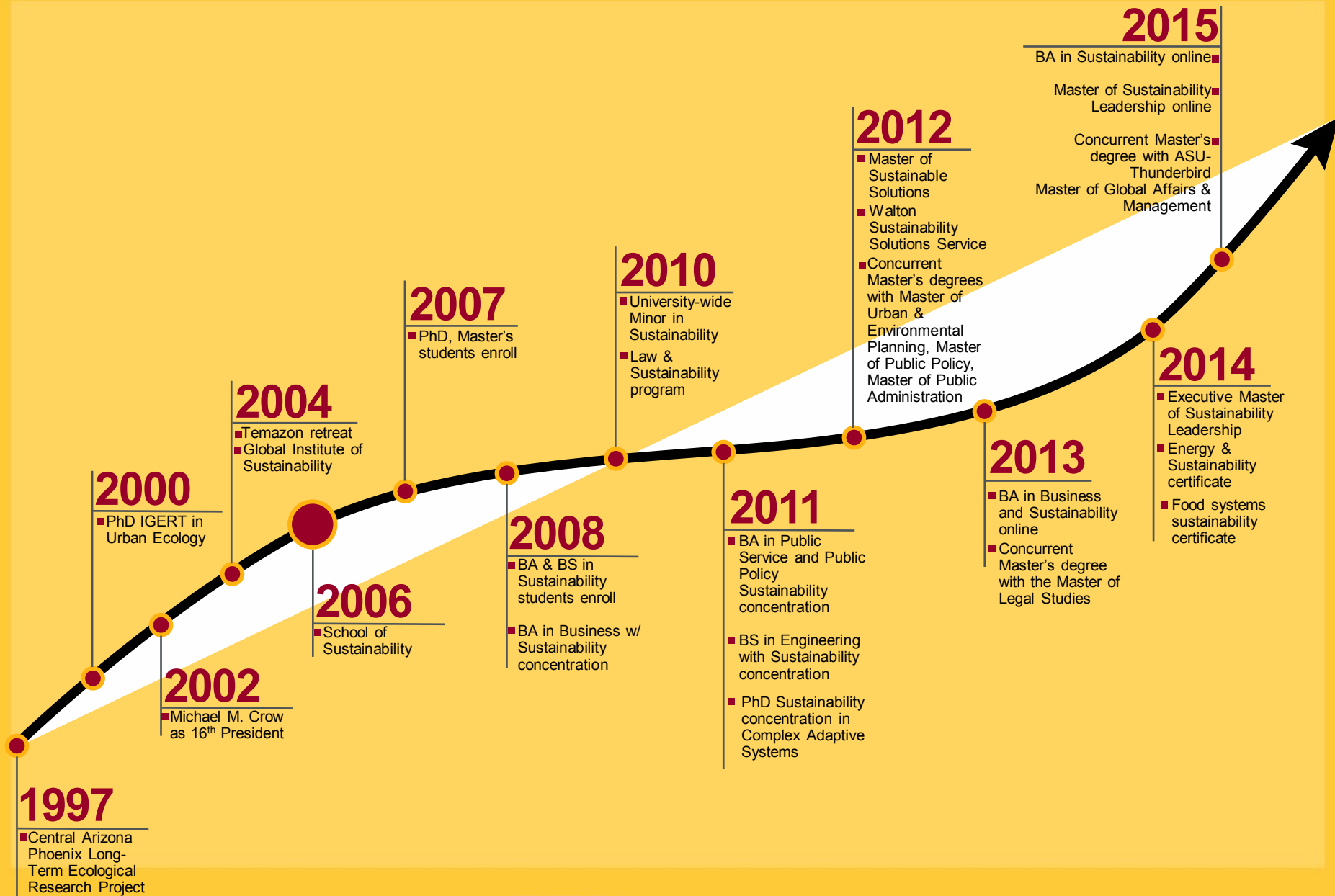
Professor Sander van der Leeuw named  
**United Nations Champion of the Earth**

**92%** Average for Student Retention

# QUESTIONS?



[Brigitte.Bavousett@asu.edu](mailto:Brigitte.Bavousett@asu.edu)





# SOS Incoming Student Camp



a **sense of belonging** on campus

**study and socialize** with fellow students in SOS

get to know and **interact informally with faculty** on a regular basis

learn about **campus resources** and services that will help you succeed

participate in **special academic and extracurricular activities** such as:

- coffee with the School Director

- field trips (hands-on learning)

- campus sustainability projects

- community gardens

# Residential Community



# Differences Between BA vs. BS

|                 | <b>BA</b>  | <b>BS</b>   |
|-----------------|--|---|
| Second Language | 202-level  | 102-level   |
| Math            | Pre-Calculus <i>and</i><br>Introduction to Applied Math<br>for the Life and Social<br>Sciences | Calculus <i>and</i><br>Introduction to Applied Math for<br>the Life and Social Sciences |
| Tracks          | Society & Sustainability   | Sustainable Energy, Materials, &<br>Technology  |
|                 | Policy & Governance in<br>Sustainable Systems  | Economics of Sustainability   |
|                 | International Development &<br>Sustainability  | Sustainable Ecosystems  |
|                 | Sustainable Urban Dynamics   |   |

# Careers

- Industry
- Non-Governmental Organizations
- Non-Profits
- Utilities
- Regulatory Agencies
- Higher Education
- Government



**Promoting  
human  
prosperity and  
well-being for all,  
while protecting  
and enhancing  
the Earth's  
life-support  
systems.**

*ASU School of Sustainability  
Board of Directors*



*Image : [psychcentral.com](http://psychcentral.com)*

# Freshman Admission Requirements (BA/BS)

|              |  |
|--------------|--|
| <b>Admit</b> | <b>Meet ASU admission requirements.</b><br><b>Have a minimum high school ABOR GPA of 3.30; AND</b> <ul style="list-style-type: none"><li><b>• A high school class rank in the top 15 percent of class; OR</b></li><li><b>• An SAT combined score of 1140 or higher; OR</b></li><li><b>• An ACT combined score of 25 or higher.</b></li></ul> <b>No high school math competency deficiency.</b> |
| In Review    | Meet ASU admission requirements.<br>Have a minimum high school ABOR GPA of 3.00; <b>AND</b> <ul style="list-style-type: none"><li><b>• A high school class rank in the top 25 percent of class; OR</b></li><li><b>• An SAT combined score of 1040 or higher; OR</b></li><li><b>• An ACT combined score of 22 or higher.</b></li></ul> No high school math competency deficiency.               |

# Transfer Admission Requirements (BA/BS)

|              |   |
|--------------|---|
| <b>Admit</b> | <b>Students (with 12 or more transfer hours after high school graduation) are required to have a cumulative transfer GPA of 3.30 or higher.</b>   |
| In Review    | <p>Students (with 12 or more transfer hours after high school graduation) are required to have a cumulative transfer GPA of 2.75 or higher.</p> <p>The following criteria must be met:</p> <ul style="list-style-type: none"><li>• 3.0 or greater in the most recent semester; <b>AND</b></li><li>• SOS 101 or particular math course w/ “B”; <b>AND</b></li><li>• SOS 110 or environmental science related course w/ “B”; <b>AND</b></li><li>• SOS 111 or sustainability related course w/ “B”; <b>AND</b></li><li>• ENG 101, 105, 107 or similar course w/ “C”.</li></ul> |

Two of the observations showing that CO<sub>2</sub> is trapping more heat:

- Satellites measure less heat escaping to space
- Surface measurements find this heat is returning to Earth to warm the surface

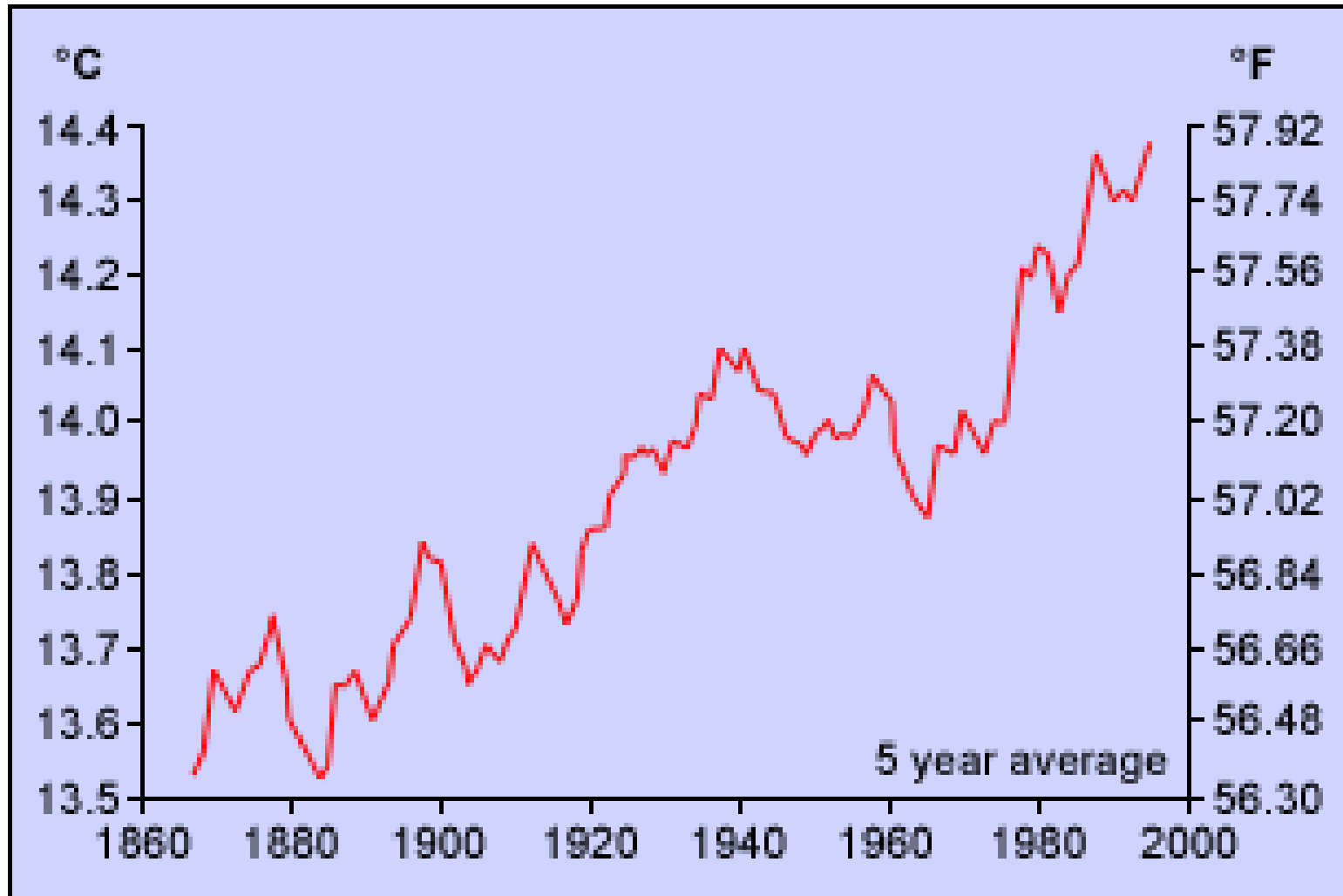


Photo credit: [www.telegraph.co.uk](http://www.telegraph.co.uk)

Source: [www.skepticalscience.com](http://www.skepticalscience.com)



# Global Average Temperature



NOAA/UCAR