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Effective Science Communication in a Complex Environment

Edward W. Lempinen, public information officer
The World Academy of Sciences (TWAS)

AAAS-TWAS Course in Science Diplomacy
10 June 2015
Trieste, Italy

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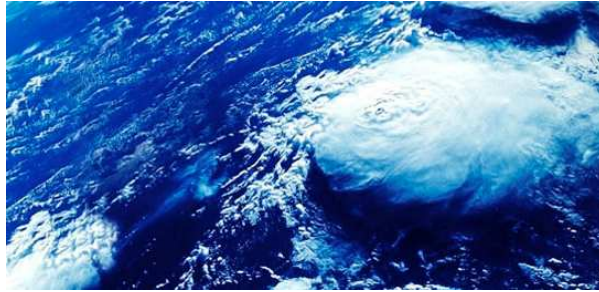
Global and regional challenges

- Natural disasters
- Climate disruption
- Infectious diseases
- Food, water security
- Energy security
- Biodiversity loss



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Global and regional challenges



Virtually every significant issue confronting the developing world has science, engineering and technology as part of the cause – or part of the solution.


4

Communicating challenge and risk

Science communication is crucial to addressing these challenges.



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The Paolo Budinich Science Diplomacy Lecture

SCIENCE & DIPLOMACY:
FROM 18TH CENTURY SCOTTISH ENLIGHTENMENT
TO 21ST CENTURY SUSTAINABLE DEVELOPMENT

Paul van Gardingen

Director, Ecosystem Services for
Poverty Alleviation Programme, United Kingdom

Venue: Kastler Lecture Hall
ICTP Adriatico Guest House, Lower Level 1
Friday, 13 June 2013 • 14:00-15:30 hours



Science and diplomacy are intricately and essentially linked, even though this may not be recognized by many members of either profession or wider society. Both are social constructs, often funded by governments and as such there is an expectation that they should contribute to the development and improvement of society around the world. Sometimes, both are criticized for failing to deliver those improvements.

This lecture will trace examples of the links between science and diplomacy from the 18th Century Scottish Enlightenment, the time of David Hume, Adam Smith and Robert Burns, through to the 21st Century, a period of growing global challenges and responses such as the UN's proposed Sustainable Development Goals.

The lecture will use examples from the United Kingdom's Ecosystem Services for Poverty Alleviation Programme (ESPA) to demonstrate the changing role of science in public and foreign policy drawing upon the three themes or dimensions that emerged from the meeting on "New Frontiers in Science Diplomacy" organized by the Royal Society and American Association for the Advancement of Science in 2009. The examples derived from ESPA, will also be used to illustrate the very significant challenges that exist for both scientists and diplomats when their domains come together.

Looking forward to 2015 and beyond, the lecture will consider how science must be central to diplomatic efforts to respond to a range of global challenges, including water, food and energy security, whilst also addressing the most important challenge of reducing global poverty.


Organized as part of the TWAS-AAAS International Science & Diplomacy Programme

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The World Academy of Sciences

for the advancement of science in developing countries

THE PAOLO BUDINICH SCIENCE DIPLOMACY LECTURE

Science Diplomacy:
Opportunities and challenges as
seen through a small-country lens



Sir Peter Gluckman

is a globally influential advocate of using science
diplomacy to improve international relations
and to address global challenges. He is Chief
Science Adviser to the Prime Minister of New
Zealand.

Thursday, 11 June 2015 • 10:30 hours

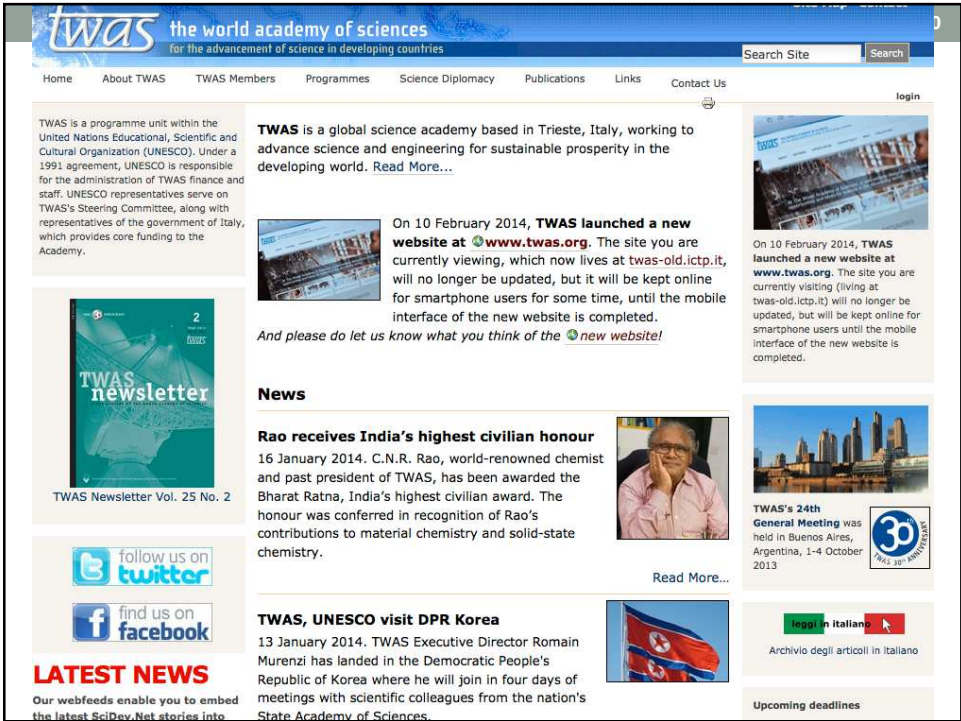
Budinich Lecture Hall • ICTP Campus
Strada Costiera 11 • 34151 Trieste

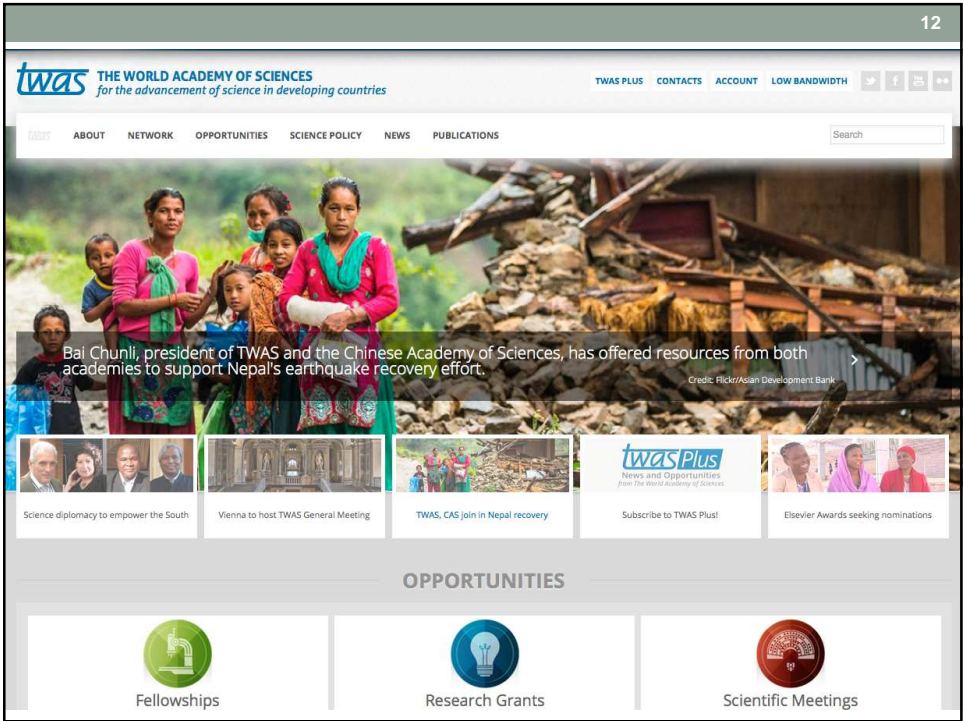
More information: sciencediplomacy@twas.org

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Communication: basic assumptions

1. People start forming responses from the first word, or at first glance.

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Communication: basic assumptions

1. People start forming responses from the first word, or at first glance.
2. People consume information superficially, or randomly.

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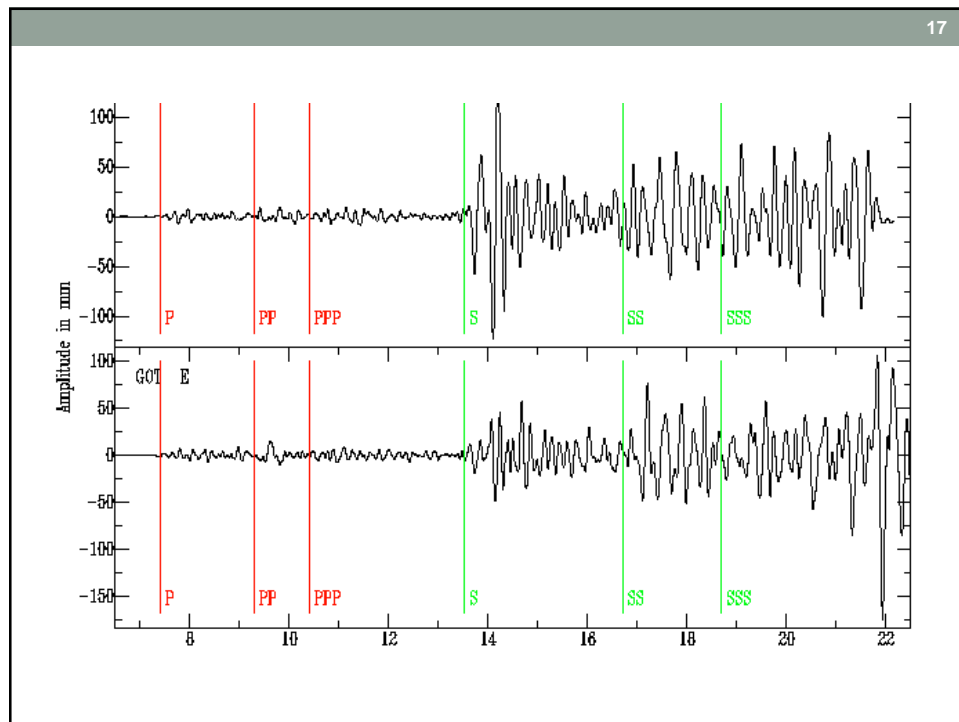
Communication: basic assumptions

1. People start forming responses from the first word, or at first glance.
2. People consume information superficially, or randomly.
3. People are overwhelmed by information.

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Communication: the challenge

How do you connect?



18

Communication: the message

What is the challenge?

19

Communication: the message

What is the challenge?

What is the solution?

20

Communication: the message

What is the challenge?

What is the solution?

What do you want to achieve?

21

Communication: the message

What do you want to achieve?

- inform
- explain
- persuade
- motivate

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Communication: the message



Who is your audience?

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Communication: the message

Who is your audience?

- the public?
- students?
- people living on an active fault?
- other scientists?
- policymakers?
- other nations?

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Who is your audience?

I might be making a
BIG mistake!

26

Who is your audience?

What is the culture of the audience?

What is their existing knowledge?

What is their bias?

Will they be inclined to embrace your
message?

27

Who is your audience?

Or will they resist it?

28

Who is your audience?

**Who is speaking to the
audience?**

29

A complex environment

$$\begin{aligned} B_i A_i &= E_i A_i + \rho_i \sum_j B_j A_j F_{ji} & \nabla \times \vec{E} &= - \frac{\partial \vec{B}}{\partial t} & \vec{F} &= m \vec{a} + \frac{dm}{dt} \vec{v} \\ dU &= \left(\frac{\partial U}{\partial S} \right)_V dS + \left(\frac{\partial U}{\partial V} \right)_S dV & \nabla \cdot \vec{D} &= \rho & Z &= \sum_j g_j e^{-E_j/kT} \\ F_j &= \sum_{k=0}^{N-1} f_k e^{2\pi i j k/N} & \nabla^2 u &= \frac{\partial u}{\partial t} & \nabla \times \vec{H} &= \frac{\partial \vec{D}}{\partial t} + \vec{J} \\ p_{n+1} &= r p_n (1 - p_n) & \nabla \cdot \vec{B} &= 0 & P(t) &= \frac{\sum_i W_i B_i(t) P_i}{\sum_i W_i B_i(t)} \\ -\frac{\hbar^2}{8\pi^2 m} \nabla^2 \Psi(r,t) + V \Psi(r,t) &= -\frac{\hbar}{2\pi i} \frac{\partial \Psi(r,t)}{\partial t} & -\nabla^2 u + \lambda u &= f \\ \frac{\partial \vec{u}}{\partial t} + (\vec{u} \cdot \nabla) \vec{u} &= -\frac{1}{\rho} \nabla p + \gamma \nabla^2 \vec{u} + \frac{1}{\rho} \vec{F} & \frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} &= f \end{aligned}$$

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Communication: Basic values

Communication = Diplomacy

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Communication: Basic values

Clarity is the highest value

32

Communication: Basic values

Simplicity in service of clarity

33

Communication: Basic values

“Be prepared!”

34

Communication: Basic values

Timing is essential

35

Communication: Basic values

Be sensitive to cultural differences

36

Communication: Basic values

Language:

- In California, 16 primary languages; 43% don't speak English at home
- In Switzerland, 4 official languages
- In the Democratic Republic of the Congo, 200+ languages

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Communication: Basic values

**Honesty and clarity
build trust**

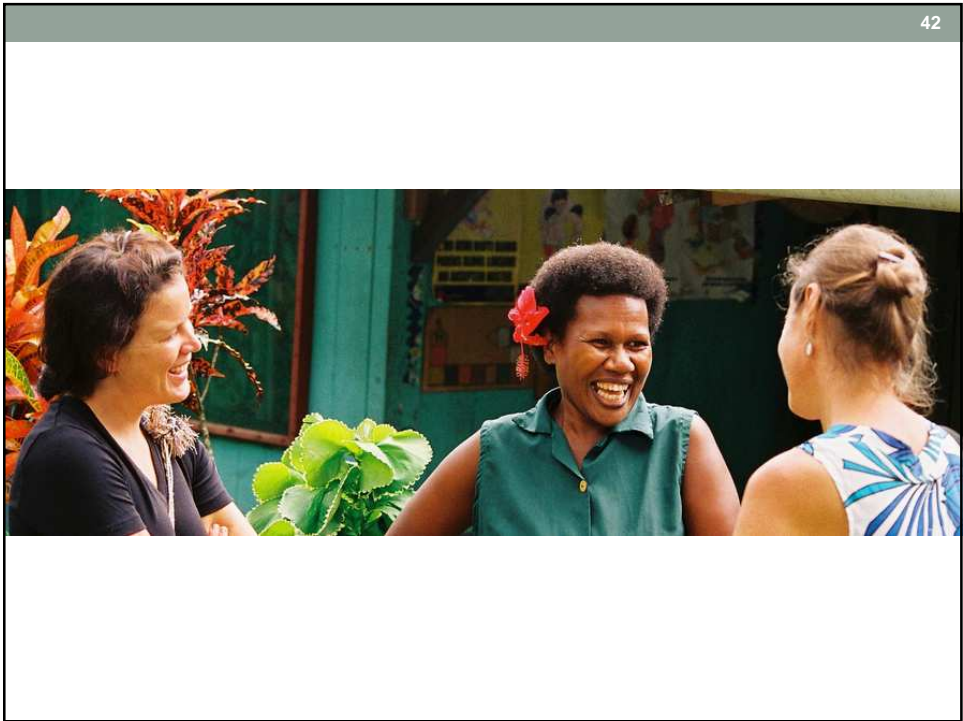
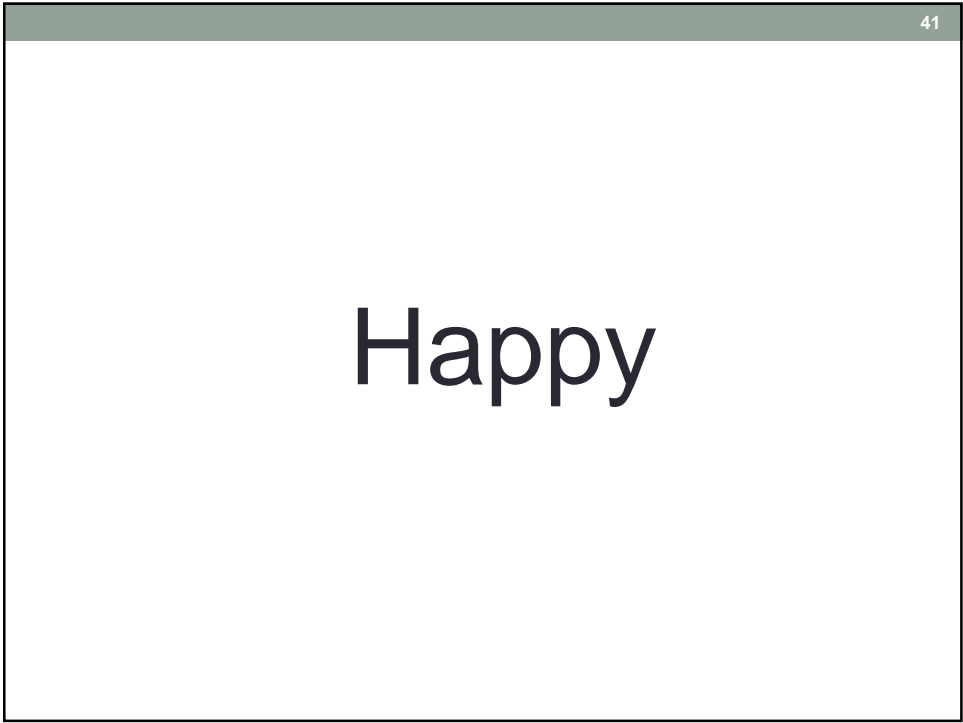
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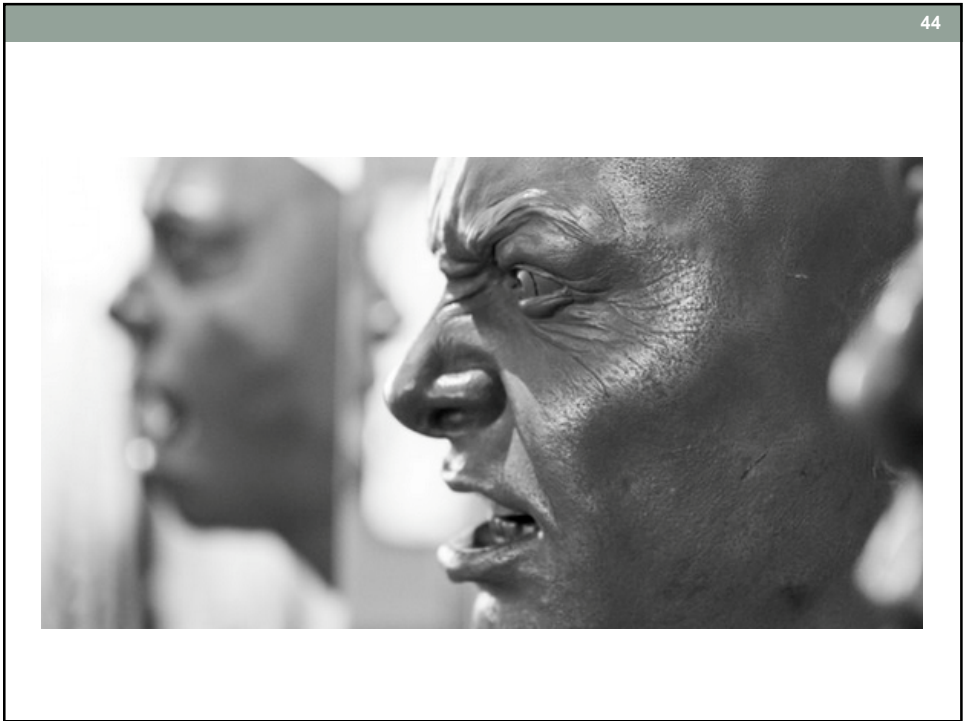
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Communication: Basic values

**Emotion can be a powerful
factor in communication**

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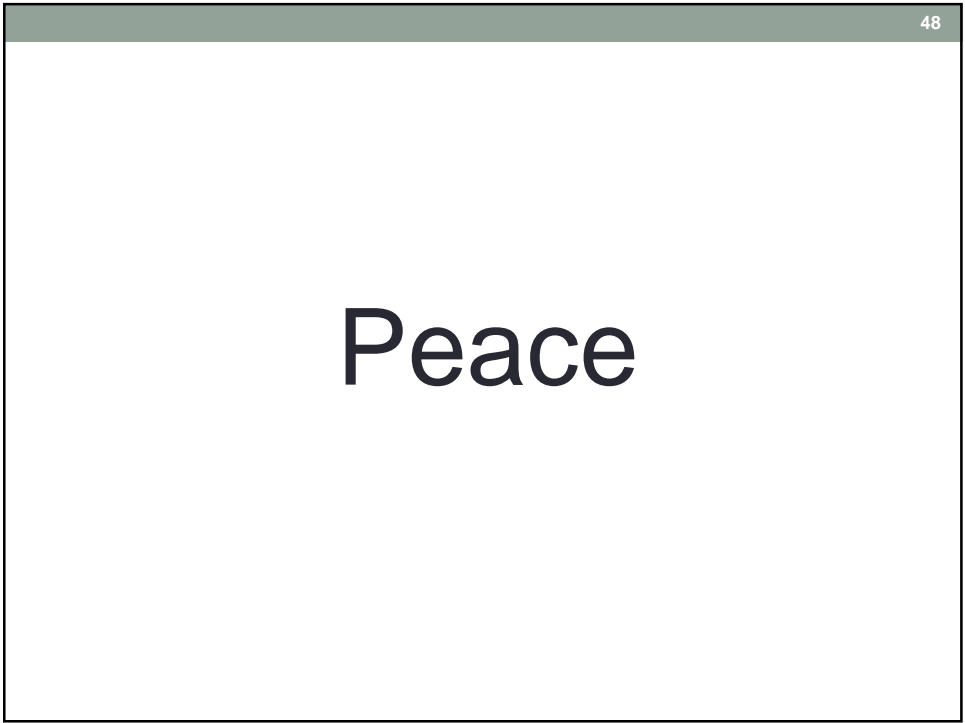


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Angry

46

Angry!





Tools of the trade: Words

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Tools of the trade: Words



John Holdren:
Climate change
is like having a
fever

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Tools of the trade: radio

"Radio remains the world's most democratic, versatile and socially transformative medium"

– SciDev.net

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Tools of the trade: film

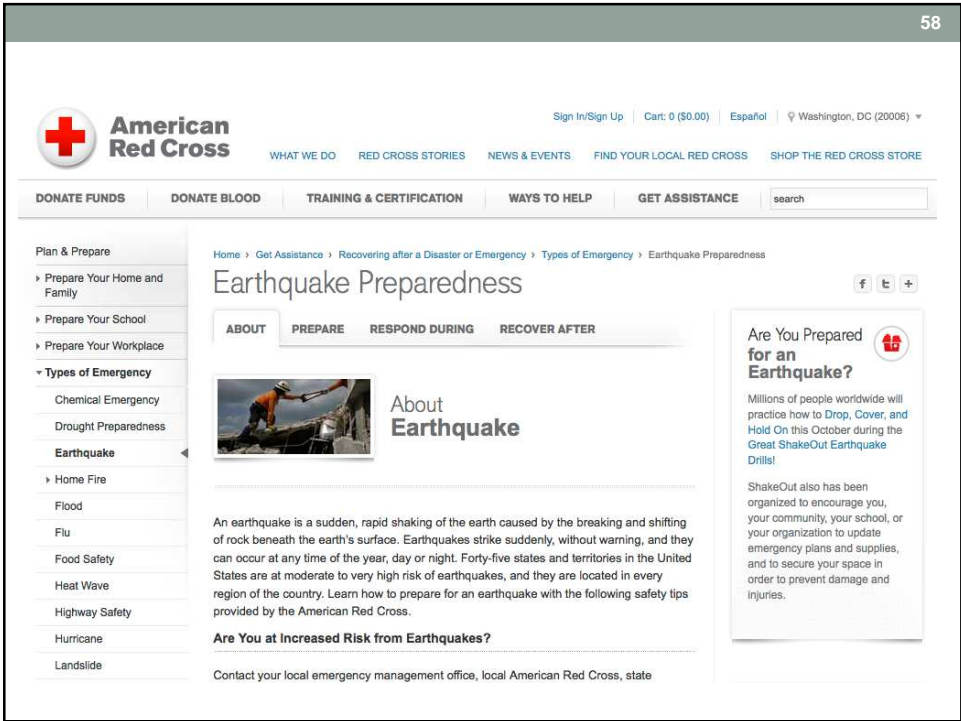
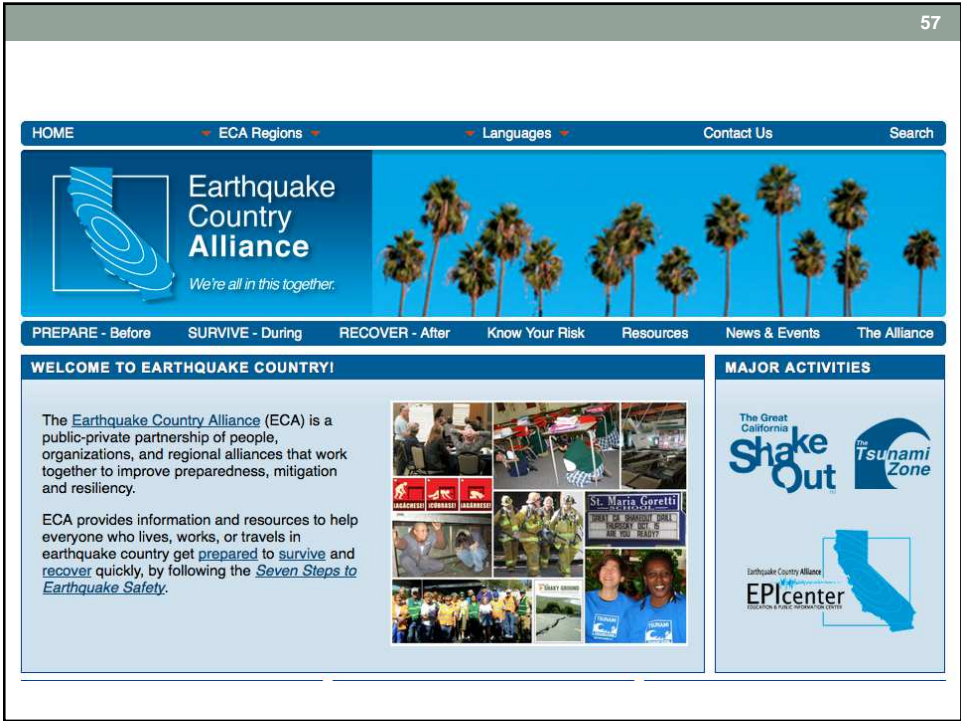


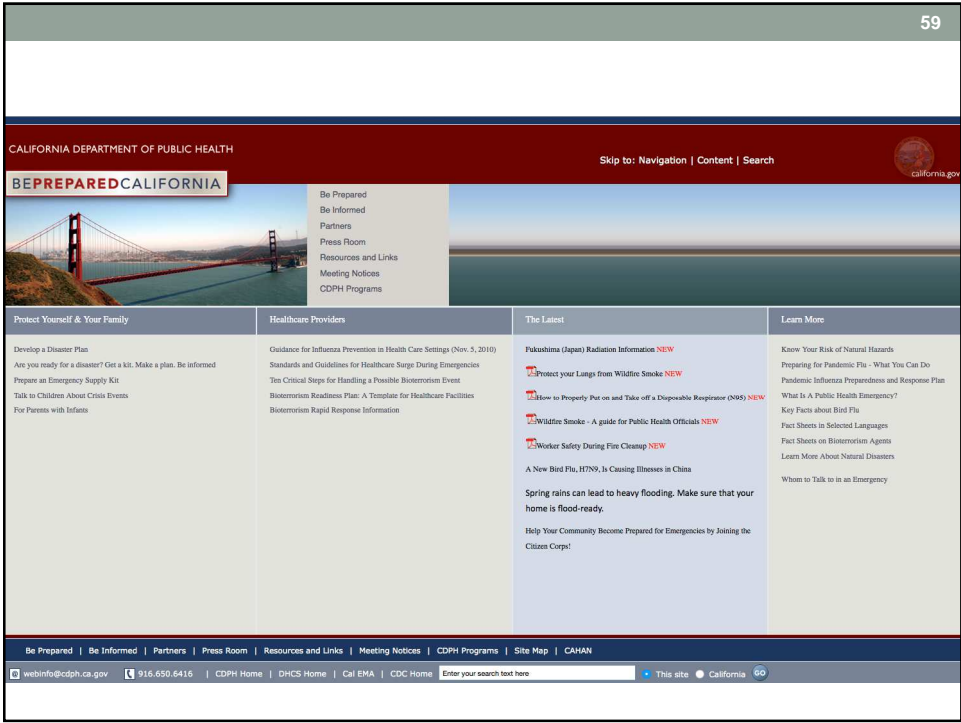
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Tools of the trade: the Internet

Many strengths,
many concerns

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Communication: Basic values

Professional communication specialists can provide valuable support to policymakers, diplomats, scientists and educators.

twas



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