COMMUNICATING CLIMATE SCIENCE

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SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
TWO TYPES OF PRODUCTS TO REVIEW – WHY TWO?

1. Climate Science Slide Presentation

2. Climate Information Handouts for Workshop Participants
## DIFFERENT COMMUNICATION NEEDS

<table>
<thead>
<tr>
<th>Briefing</th>
<th>Handout</th>
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</thead>
<tbody>
<tr>
<td><strong>Who?</strong></td>
<td>A group</td>
</tr>
<tr>
<td><strong>What?</strong></td>
<td>The minimum facts</td>
</tr>
<tr>
<td><strong>When?</strong></td>
<td>In the workshop</td>
</tr>
<tr>
<td><strong>How?</strong></td>
<td>Spoken</td>
</tr>
<tr>
<td><strong>Why?</strong></td>
<td>Shared focus/Consistency in understanding</td>
</tr>
</tbody>
</table>
IT TAKES A TEAM!

Project Manager
Training Instructor & Project Coordinator
Science Information Expert
Climate Scientists
Risk Communication Expert
Communication Specialist
Visual Communication Expert
Graphic Designer
WHY DO WE NEED TO THINK ABOUT THIS?

- Communication is surprisingly important AND takes time
- Provide lessons learned during the evolution of these two products so that...
- You can help with this effort in your own agency (EVERY agency must communicate climate information)

"The problem with communication is the illusion that it has occurred."
- George Bernard Shaw
Climate Science Slide Presentation
WHAT MAKES THE CLIMATE TALK WORK?
PART 1 - STREAMLINING

• Its Length (or rather, lack thereof)
  - Presentation evolved from 3 separate presentations on Global, Regional, and Local Climate Science
Climate Information Sharing – 1st Attempt

We went from paper handouts with lots of numbers....

<table>
<thead>
<tr>
<th>Table 3.1. Baseline climate and mean annual changes$^a$</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td>-----------------------------------------------</td>
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<tr>
<td><strong>Air temperature</strong></td>
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<tr>
<td>Central range</td>
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<tr>
<td>Precipitation</td>
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<tr>
<td><strong>Sea level rise</strong></td>
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<tr>
<td>Central range</td>
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<td>Rapid ice-melt scenario</td>
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</tbody>
</table>

Source: Columbia University Center for Climate Systems Research.

$^a$Based on 16 GCMs (7 GCMs for sea level rise) and 3 emissions scenarios. Baseline is 1971–2000 for temperature and precipitation and 2000–04 for sea level rise. Data from National Weather Service (NWS) and National Oceanic and Atmospheric Administration (NOAA). Temperature data are from Central Park; precipitation data are the mean of the Central Park and La Guardia Airport values; and sea level data are from the Battery at the southern tip of Manhattan (the only location in New York City for which comprehensive historic sea level rise data are available).

$^b$Central range = middle 67% of values from model-based probabilities; temperature ranges are rounded to the nearest half-degree, precipitation to the nearest 5%, and sea level rise to the nearest inch.

$^c$The model-based, sea level rise projections may represent the range of possible outcomes less completely than the temperature and precipitation projections.

$^d$“Rapid ice-melt scenario” is based on acceleration of recent rates of ice melt in the Greenland and West Antarctic ice sheets and paleoclimate studies.
What is projected locally?

Average temperatures are projected to rise.
TIPS FOR SUCCESS

• Attention to What the Participants Can Absorb, and What They *Need* to do Their Jobs

• Engaging Graphics to Convey the Chief Points

• Text to Reinforce the Take-Home Messages

• NOT “Dumbing Down”, but Focusing the Information

  “Data” is not necessarily the same thing as “Information”
GETTING DOWN TO SPECIFICs

With regard to length, we narrowed down the talk to answer a few primary questions:

What’s the difference between weather and climate?
An important distinction

*Weather* describes current and near-term conditions

*Climate* describes weather patterns over a longer term

“*Weather is what you get; climate is what you expect.*”
CLIMATE QUESTIONS, CONT.

What is already happening locally?
What’s already happened *locally*?

**Sea Level**
has risen over decades, though individual years vary somewhat.

**Temperature**
has risen too, but the trend varies more year-to-year.

* A century of local data tells us the climate is changing
What is the basis for climate projections?
Gathering better data

NASA’s orbital perspective is a critical vantage-point
Powerful computer models let us test and refine hypotheses
Consensus-based projections using
• Several models
• Several future greenhouse gas emission scenarios

Updated as the science advances

NASA contributes to a worldwide consensus
Central range of models is basis for NASA’s projections
Rising precision/resolution over time

New models + better data = more specific projections
What is projected to happen locally?
What is projected locally?

Average Annual Temperature (°F)

Recent | 2020’s | 2050’s | 2080’s

Average temperatures are projected to rise
WHAT MAKES THE CLIMATE TALK WORK?
PART 2 - TALKING DURING CLASS

• Slides evolved into a “climate conversation” between institutional steward and climate scientist.
GO AHEAD – ASK THE CLIMATE SCIENTIST A QUESTION

Participants used post-it notes to ask questions
BREAKING THE ICE, IN A GOOD WAY

- Allowed for some breaks in the presentation
- Clarified how the institutional side “heard” the climate message
- Reinforced how to use climate data to improve resiliency of the Center
- Broke down barriers by encouraging table conversation
SUMMARY: WHY THE SCIENCE PRESENTATION ROCKS!

❖ Short – fewer than 20 slides

❖ Engaging, simple graphics with no need to read and interpret complex graphs

❖ Reinforced message with tag lines

❖ “Conversation” technique, with questions from participants, more interactive
Climate Information Handout
INFORMATIONAL, CENTER-SPECIFIC HANDOUTS
FRONT PANEL PIQUES INTEREST

“Hmmm. Attractive photo, not too intimidating. Maybe I’ll open it and see what this climate change thing is about.”
AN “ISSUE” PANEL SETS THE STAGE

Two simple graphs demonstrate historic temperature and sea level rise.

One clear message — your area has already experienced climate change.
A “WHAT’S AT STAKE” PANEL TELLS WHY IT’S IMPORTANT

Reference the mission, the community, the natural setting, the jobs supported by the area, etc.

Find something they care about and use photos!
Mixture of Text and Data tells them what to expect in the future.

Factual, neutral language tells it straight.
“OUR RESPONSIBILITY” PANEL INSPIRES AND ADVISES

Often features a photo that shows adaptation measure in place, such as a green building.

Advises action now rather than delaying.
“FINE PRINT” PANEL HAS ALL THE SCIENCE YOU NEED TO KNOW

...and probably more.

Provides more details on the modeling approach and associated uncertainty.

Contains web links for academic references.

A Note about Downscaling Climate Data Specifically for Individual NASA Centers

The quantitative climate projections in this document are based on global climate model simulations conducted for the IPCC Fourth Assessment Report (2007) from the World Climate Research Programme’s (WCRP’s) Coupled Model Intercomparison Project Phase 3 (CMIP3) multi-model dataset. The simulations provide results from sixteen global climate models that were run using three emissions scenarios of future greenhouse gas concentrations. The outputs are statistically downscaled to 1/12 degree resolution (~12 km by 12 km) based on outputs from the bias-corrected (to accurately reflect observed climate data) and spatially-disaggregated climate projections derived from CMIP3 data. Results provide a more refined projection for a smaller geographic area. This information is maintained at: [http://gdo-dcp.ucarl.org/downscaled_cmip3_projections](http://gdo-dcp.ucarl.org/downscaled_cmip3_projections) and described by Maurer, et al. (2007).

The rapid ice melt scenario and qualitative projections reflect a blend of climate model output, historical information, and expert knowledge. For more information about rapid ice melt, see a paper and references at [http://www.nature.com/climate/2010/1004/pdf/climate.2010.29.pdf](http://www.nature.com/climate/2010/1004/pdf/climate.2010.29.pdf).

Key Uncertainties Associated with Climate Projections

Climate projections and impacts, like other types of research about future conditions, are characterized by uncertainty. Climate projection uncertainties include but are not limited to:

1. Levels of future greenhouse gas concentrations and other radiatively important gases and aerosols,
2. Sensitivity of the climate system to greenhouse gas concentrations and other radiatively important gases and aerosols,
3. Climate variability, and
4. Changes in local physical processes (such as afternoon sea breezes) that are not captured by global climate models.

Even though precise quantitative climate projections at the local scale are characterized by uncertainties, the information provided here can guide resource stewards as they seek to identify and manage the risks and opportunities associated with climate variability/climate change and the assets in their care.

SUMMARY: WHY THESE HANDOUTS WORK

- They’re colorful
- Hard copy (they are refrigerator worthy!)
- Data clearly displayed for all audiences
- Language is straightforward and factual
- “Fine print” on the back panel provides the scientific basis for information
- “Story Board” reveals information to the reader in a deliberate order
TIPS FOR CLIMATE COMMUNICATION PRODUCTS

• Make the graphs as simple as possible AND be true to the science and interests of intended audience
• Engage multiple reviewers
• Acknowledge uncertainty, but do not let it derail progress
• Use factual language to create a sense of urgency for some, but not all, aspects
QUESTIONS?

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