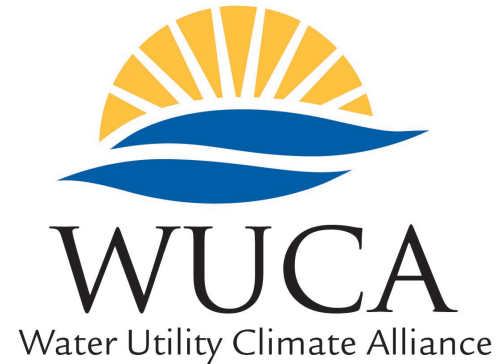


**Building Resilience to a Changing Climate:  
A Technical Training in Water Sector  
Utility Decision Support**



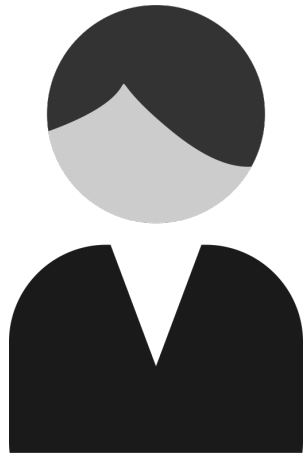
**Decisions for the Decade:  
A “Serious Game” for Water Planners**

# *Decisions for the Decade*

How do we make smart long-term decisions?



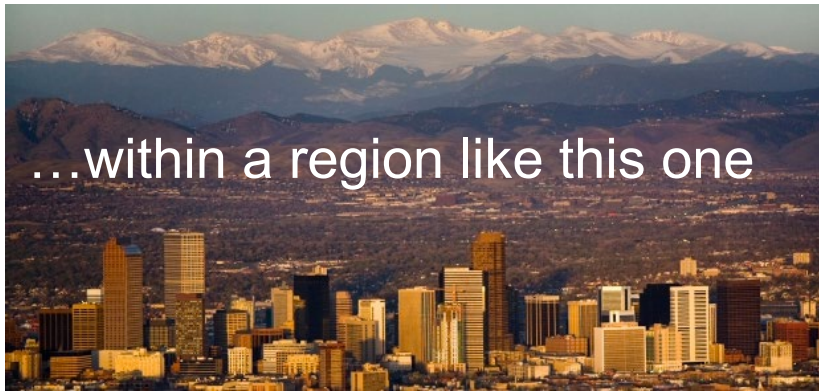
**All Participate**  
(...expect confusion...)



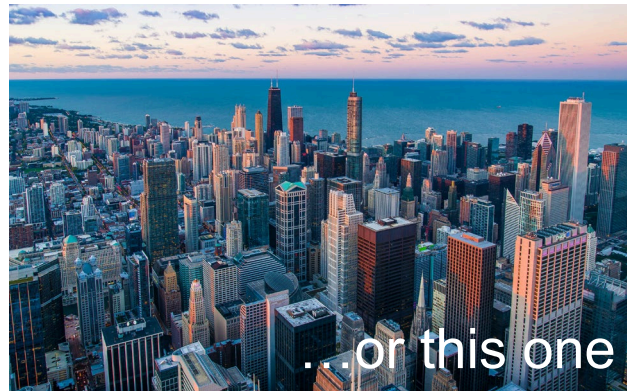
You are a Principal Planner



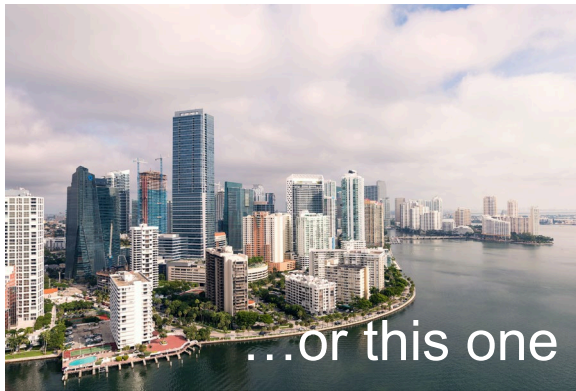
...of a large city



...within a region like this one



...or this one



...or this one



or this one!

# Your objective....

## prepare your community for the future

- What will the future bring?
- Will it be different from the past? In what way?
- What investment decisions should we make?
- Will we be prepared?





Protection

Development



# Making Decisions

**City** decisions are independent

- Use the online survey to allocate 10 tokens.



**Regional** decisions require teamwork

- Coordinate within your region in breakout rooms and collectively submit 1 survey to allocate 10 tokens.



# Making Decisions

**INVESTMENT & DEVELOPMENT**  
Earn Prosperity Points, if no crisis

**DROUGHT PROTECTION**  
If a drought occurs, you use 1  
protection token

**FLOOD PROTECTION**  
If a flood occurs, you use 1  
protection token



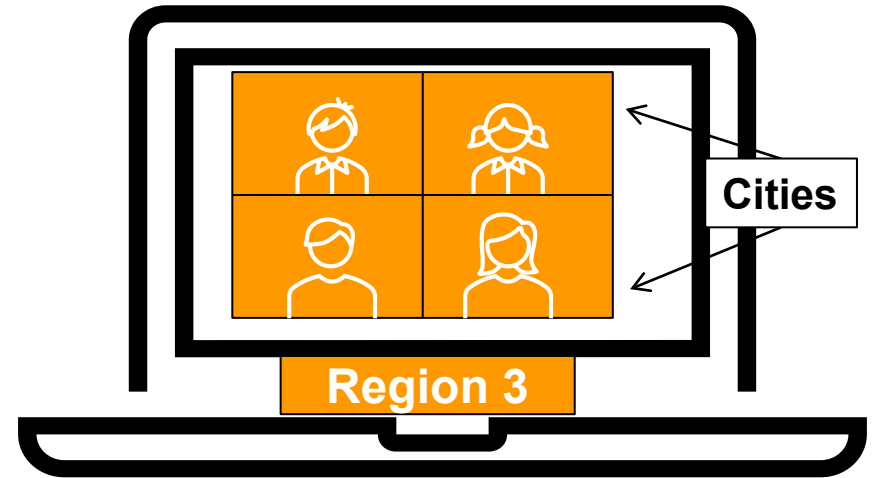
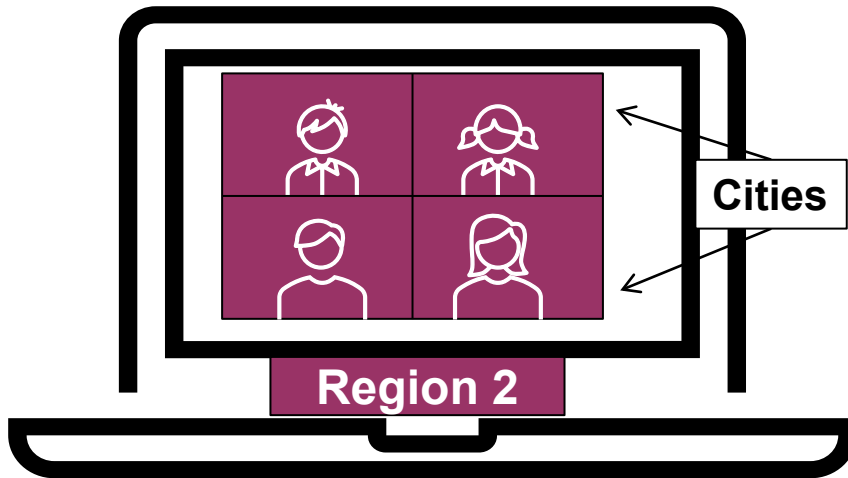
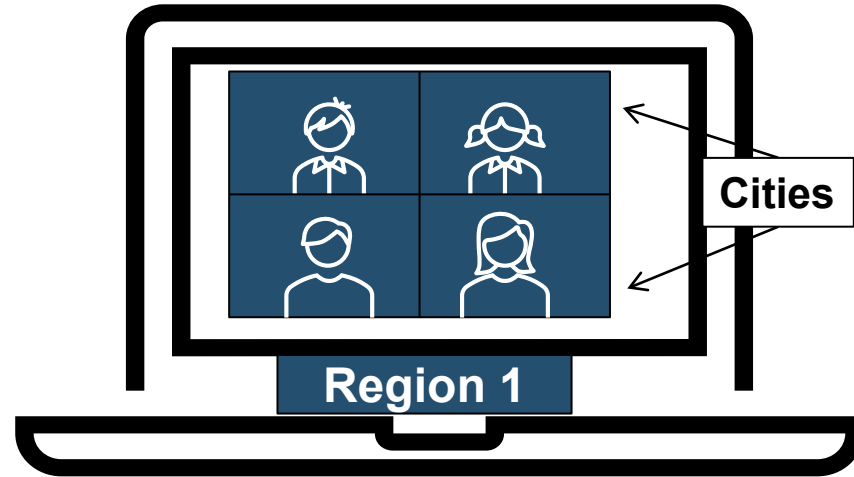
## Allocating your Budget

Use the decade survey provided in the chat to submit your budget each decade.

Note: each decade has its own survey!

If you're having trouble, raise your hand!

# The Set Up





# Steps of the Game

**1. Receive Scientific Information**

**2. Make Decisions**

**3. See Observations**

**4. Review Results**

# Steps of the Game

**1. Receive Scientific Information**

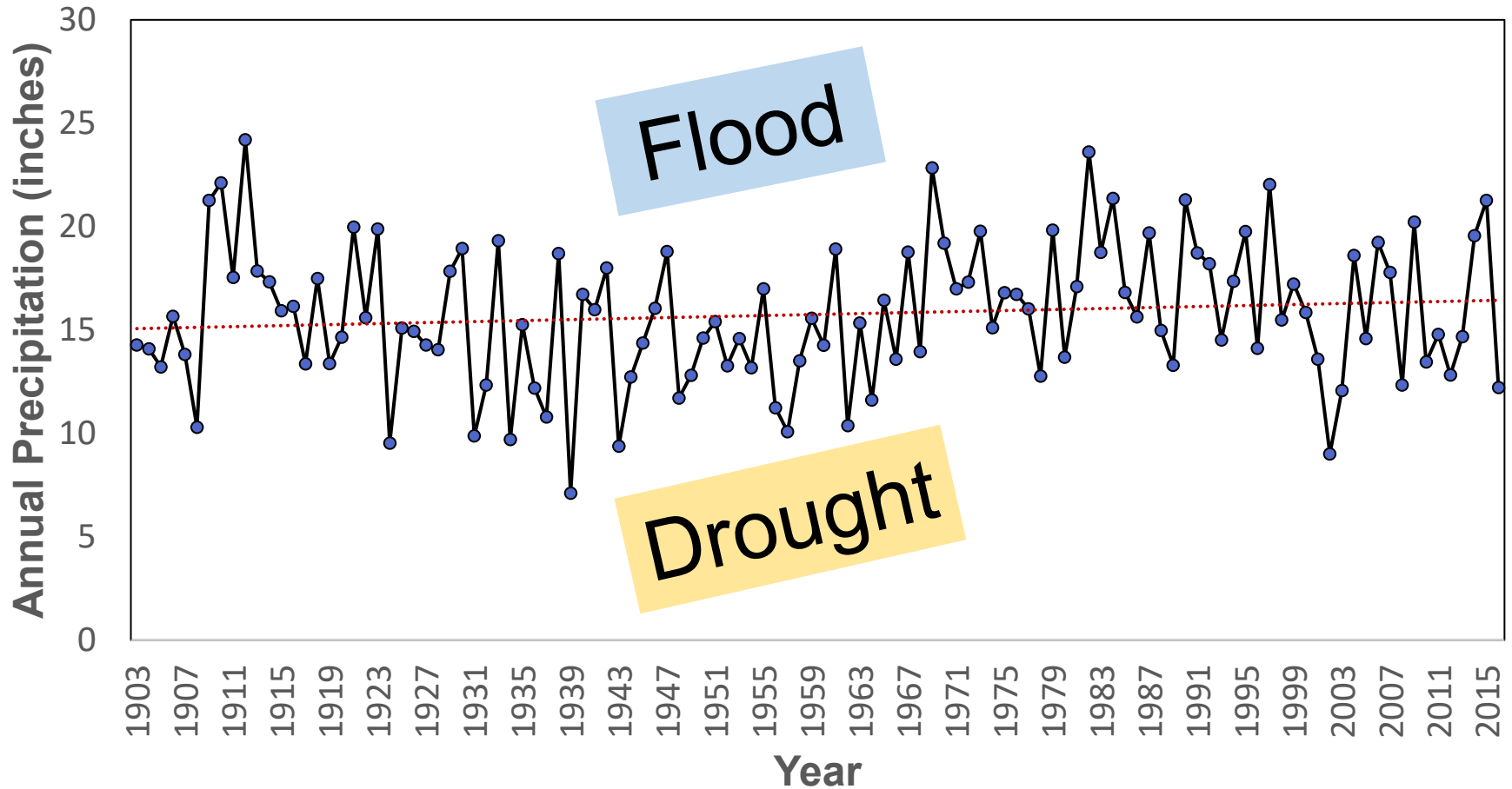
**2. Make Decisions**

**3. See Observations**

**4. Review Results**

# 1. Scientific Information

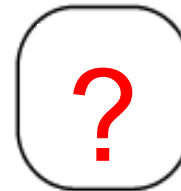
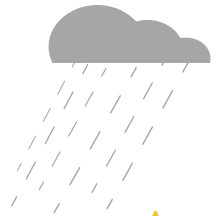
## Annual Precipitation Cheesman Reservoir (1903-2016)



Typical Information



= Flood



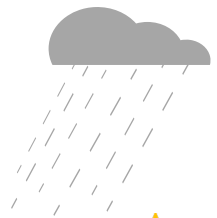
= Drought



The game's source of information



= Flood



= Drought



The game's source of information

# Steps of the Game

**1. Receive Scientific Information**

**2. Make Decisions**

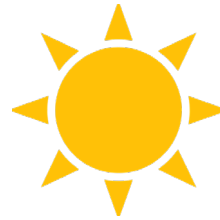
**3. See Observations**

**4. Review Results**

## 2. Make Decisions

- Allocate resources (10 tokens) for each decade

- Drought protection



- Flood protection



- New investments, operations, maintenance, infrastructure upgrades, roads



Drought  
Protection

Flood  
Protection

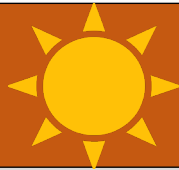
Development





**DROUGHT PROTECTION**

If you roll a drought: you lose 1 token



**INVESTMENT & DEVELOPMENT**



Earn Prosperity Points, if no crisis



**FLOOD PROTECTION**

If you roll a flood: lose 1 token




**DROUGHT PROTECTION**  

If you roll a drought: you lose 1 token

**INVESTMENT & DEVELOPMENT** 

Earn Prosperity Points, if no crisis

**FLOOD PROTECTION** 

If you roll a flood: lose 1 token

<b>Your Funding Allocations</b>		
<b>Drought Protection</b>	<b>Development</b>	<b>Flood Protection</b>
1	9	0

# Steps of the Game

**1. Receive Scientific Information**

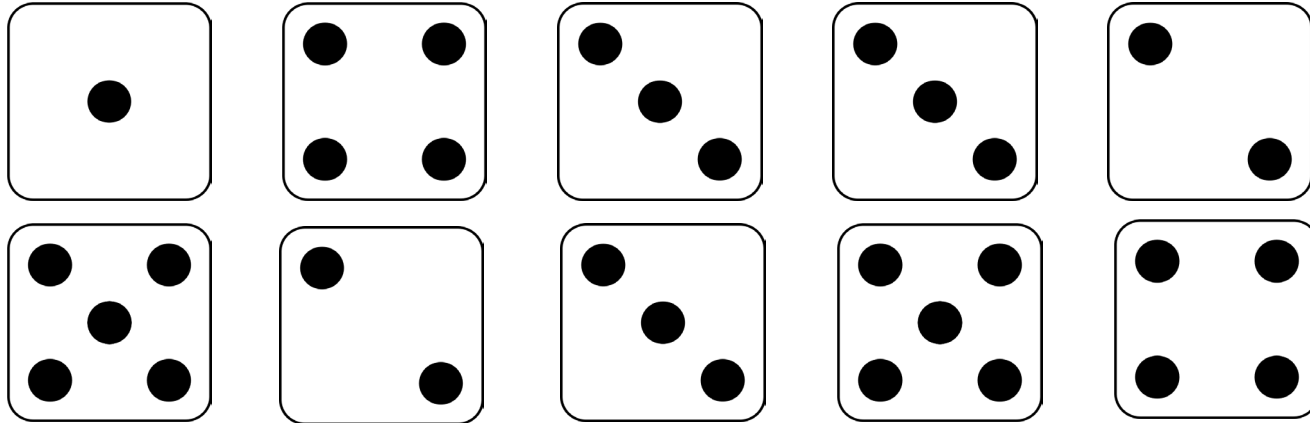
**2. Make Decisions**

**3. See Observations**

**4. Review Results**

# 3. See Observations

Ten years of precipitation occur



If you roll a...	You get...
1	Drought
2, 3, 4, 5	Normal Conditions
6	Flood



# Steps of the Game

**1. Receive Scientific Information**

**2. Make Decisions**

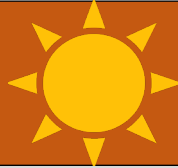
**3. See Observations**

**4. Review Results**

# 4. Review Results

## DROUGHT PROTECTION

If you roll a drought: you lose 1 token



## INVESTMENT & DEVELOPMENT

Earn Prosperity Points, if no crisis



## FLOOD PROTECTION

If you roll a flood: lose 1 token



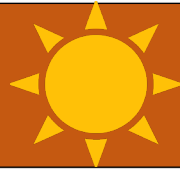
We protected against 1 drought...

**Since one drought occurs, we use one token...**

# 4. Review Results

## DROUGHT PROTECTION

If you roll a drought: you lose 1 token



## INVESTMENT & DEVELOPMENT

Earn Prosperity Points, if no crisis



## FLOOD PROTECTION

If you roll a flood: lose 1 token



**...and we get 9 Prosperity Points!**





# 4. Review Results

## DROUGHT PROTECTION

If you roll a drought: you lose 1 token



## INVESTMENT & DEVELOPMENT

Earn Prosperity Points, if no crisis



## FLOOD PROTECTION

If you roll a flood: lose 1 token

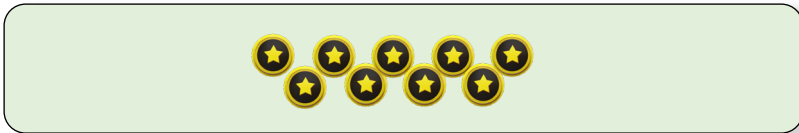


**But what if we had a second drought?**

# 4. Review Results

*If one drought occurs:*

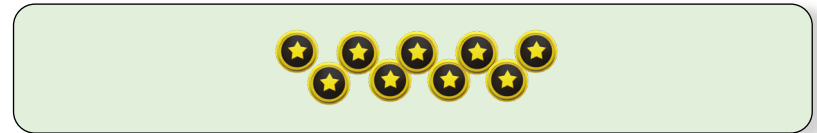
## Scenario 1



# Crises	# Prosperity Points
0	9

*If another drought had occurred:*

## Scenario 2



# Crises	# Prosperity Points
1	0



# Repeat Steps of the Game

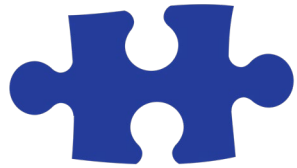
**1. Receive Scientific Information**

**2. Make Decisions**

**3. See Observations**

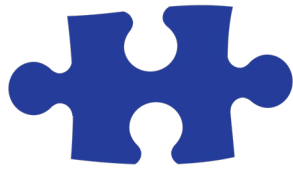
**4. Review Results**

# Key Rules



## **Simplification of reality**

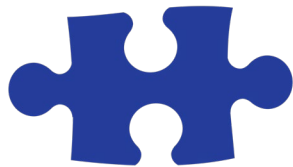
*No challenging the rules!*



## **Decisions are individual**

*No consulting on City Decisions*

*Do collaborate on Regional Decisions*



## **We will play 4 decades of decision making**

*Each round is 10 years*

# Winning The Game

## Winning City:

- *City with fewest crises from all Regions*
- *Tiebreaker within Region: City with the most Prosperity points*

## 1 Winning Region:

- *Most Prosperity Points*
- *Tiebreaker: Region with fewest crises*

**Let's Play!!!**

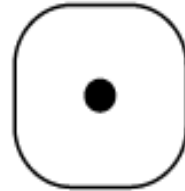
# Round 1

(years 1-10)

# 1. SCIENTIFIC INFORMATION Historical Precipitation



= Flood



= Drought





## 2. DECISIONS

**Make investments for the coming decade**

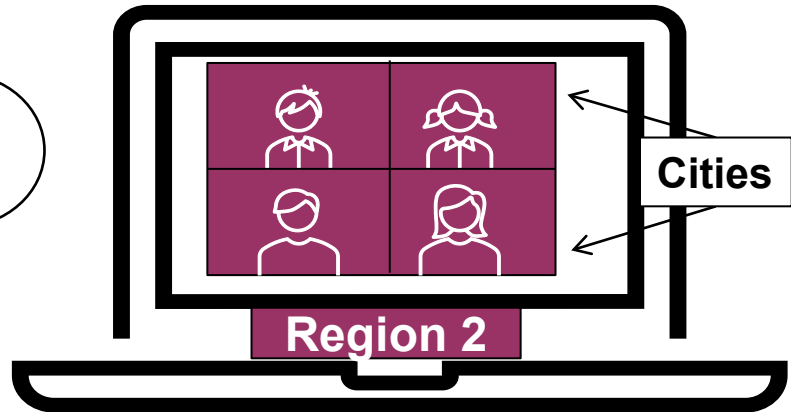
Use the survey link in the chat to allocate your 10 tokens

1<sup>st</sup>



**City**

2<sup>nd</sup>



**Region**

# 3. Observations

*Did you plan for this decade well? Let's see what happens!*

## DECADE 1



Roll

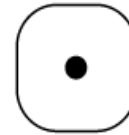
Click the Roll button to roll your dice and populate your Decade 1 Observations.

Decade 1 Observations										
Year	1	2	3	4	5	6	7	8	9	10
Result										
Observation										

# 4. Results



= Flood



= Drought



## Review results

Decade 1 Results	
# Crises	# Prosperity Points



Any crises?

How much prosperity?

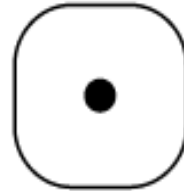
# Round 2

(years 11-20)

# 1. SCIENTIFIC INFORMATION Historical Precipitation



= Flood



= Drought



## **2. DECISIONS**

# **New Investment Option: Robustness**

### **Robust Option**

- You are guaranteed a fixed number of prosperity points, no matter how many floods or droughts occur
- But you must give all tokens above that fixed number to the bank
- How many prosperity points would you accept for this robust option?

## 2. DECISIONS

**Make investments for the coming decade**

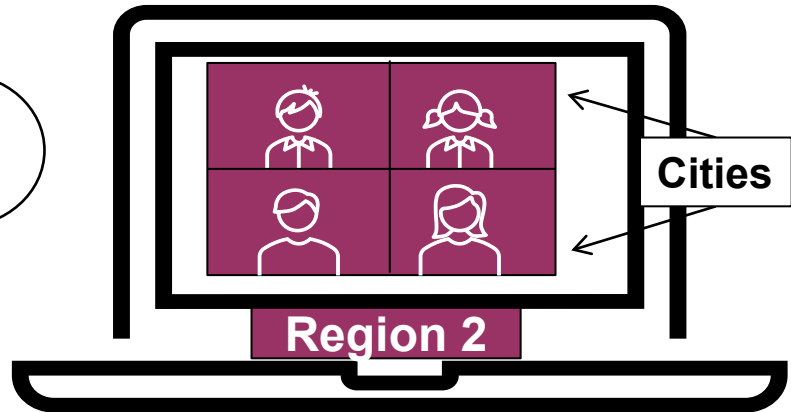
Allocate your 10 tokens or select the robust option.

1<sup>st</sup>



**City**

2<sup>nd</sup>



**Region**

# 3. Observations

*Did you plan for this decade well? Let's see what happens!*

**DECADE 2**



Roll

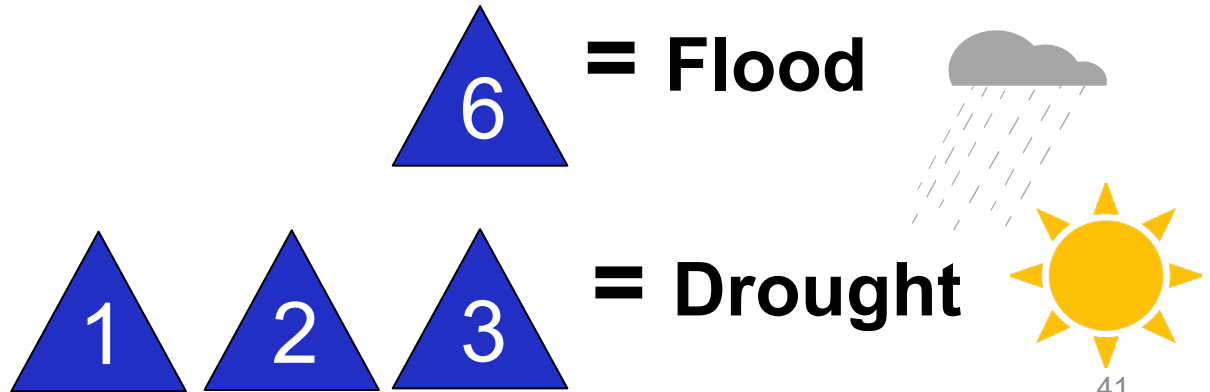
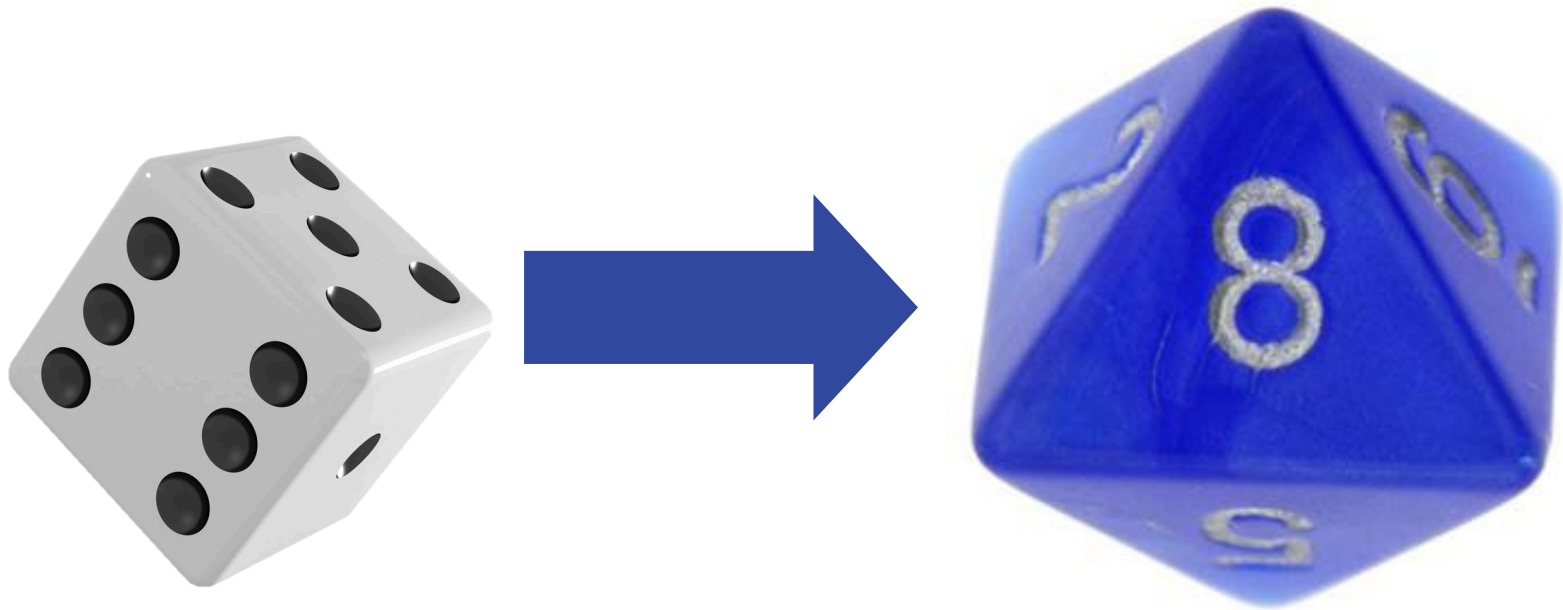
Click the Roll Button to roll your dice and populate your Decade 2 Observations

Decade 2 Observations										
Year	1	2	3	4	5	6	7	8	9	10
Result										
Observation										

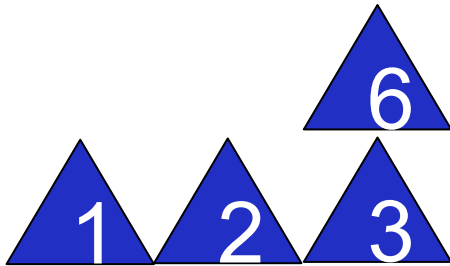


Have you heard about...

# CLIMATE CHANGE?



# 4. Results



= Flood



= Drought



Review results

Decade 2 Results	
# Crises	# Prosperity Points



Any crises?

How much prosperity?

# Round 3

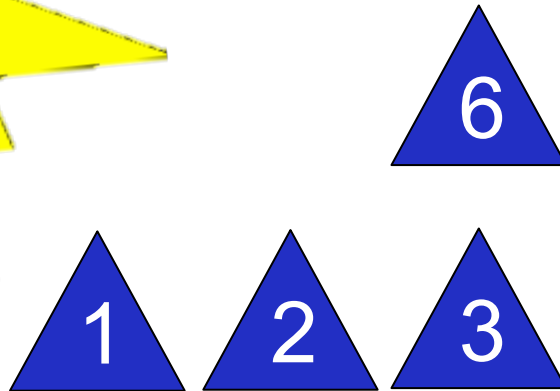
(years 31-40)

# 1. SCIENTIFIC INFORMATION

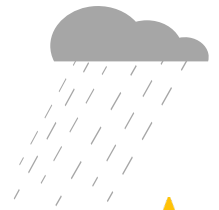
## Precipitation Under Climate Change

**News Flash!**

IPCC to release more climate information in the next 5-10 years



= Flood



= Drought



## 2. DECISIONS

# Robust Option Again Available

### Robust Option

- You are guaranteed a fixed number of prosperity points, no matter how many floods or droughts occur
- But you must give all tokens above that fixed number to the bank
- How many prosperity points would you accept for this robust option?

## 2. DECISIONS

**Make investments for the coming decade**

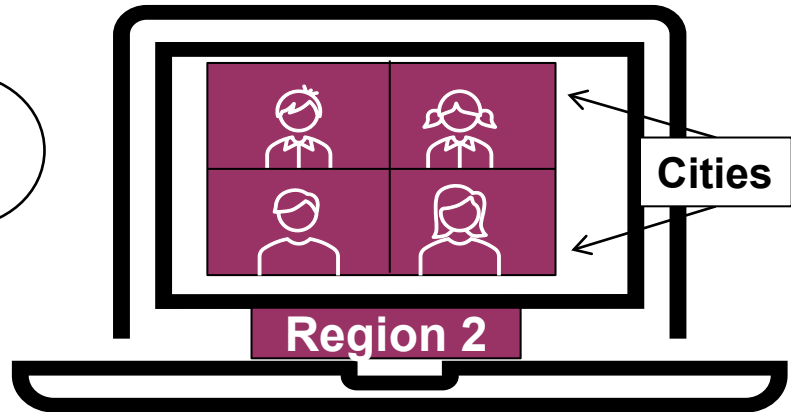
Allocate your 10 tokens or select the robust option.

1<sup>st</sup>



**City**

2<sup>nd</sup>



**Region**

# 3. Observations

*Did you plan for this decade well? Let's see what happens!*

**DECADE 3**

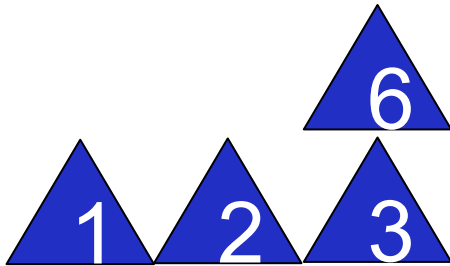


Roll

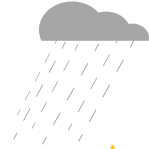
Click the Roll button to roll your dice and populate your Decade 3 Observations.

Decade 3 Observations										
Year	1	2	3	4	5	6	7	8	9	10
Result										
Observation										

# 4. Results



= Flood



= Drought



Review results

Decade 3 Results	
# Crises	# Prosperity Points



Any crises?

How much prosperity?

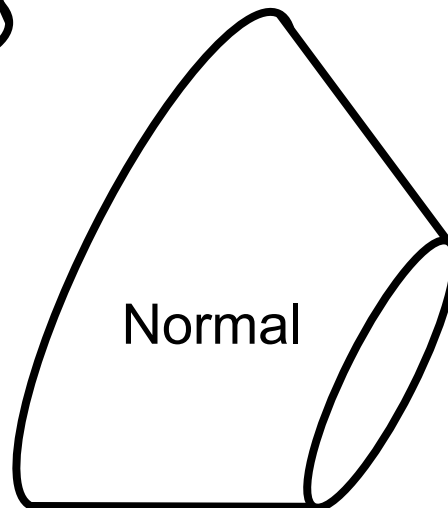
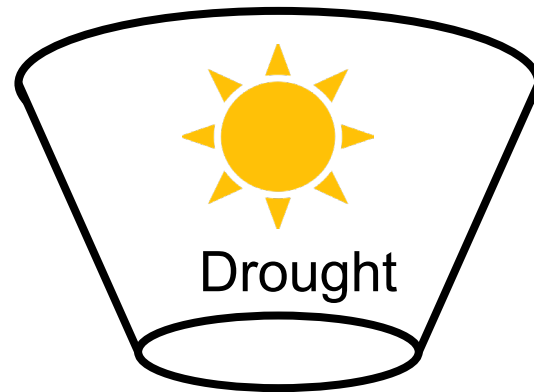
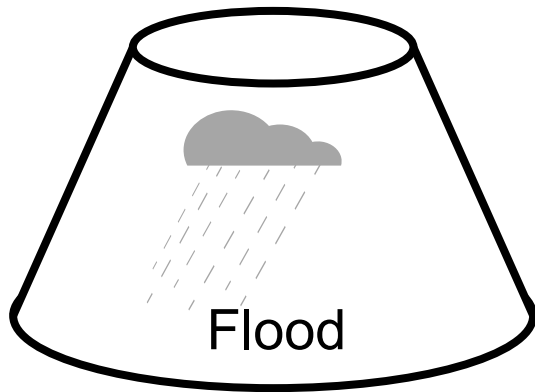


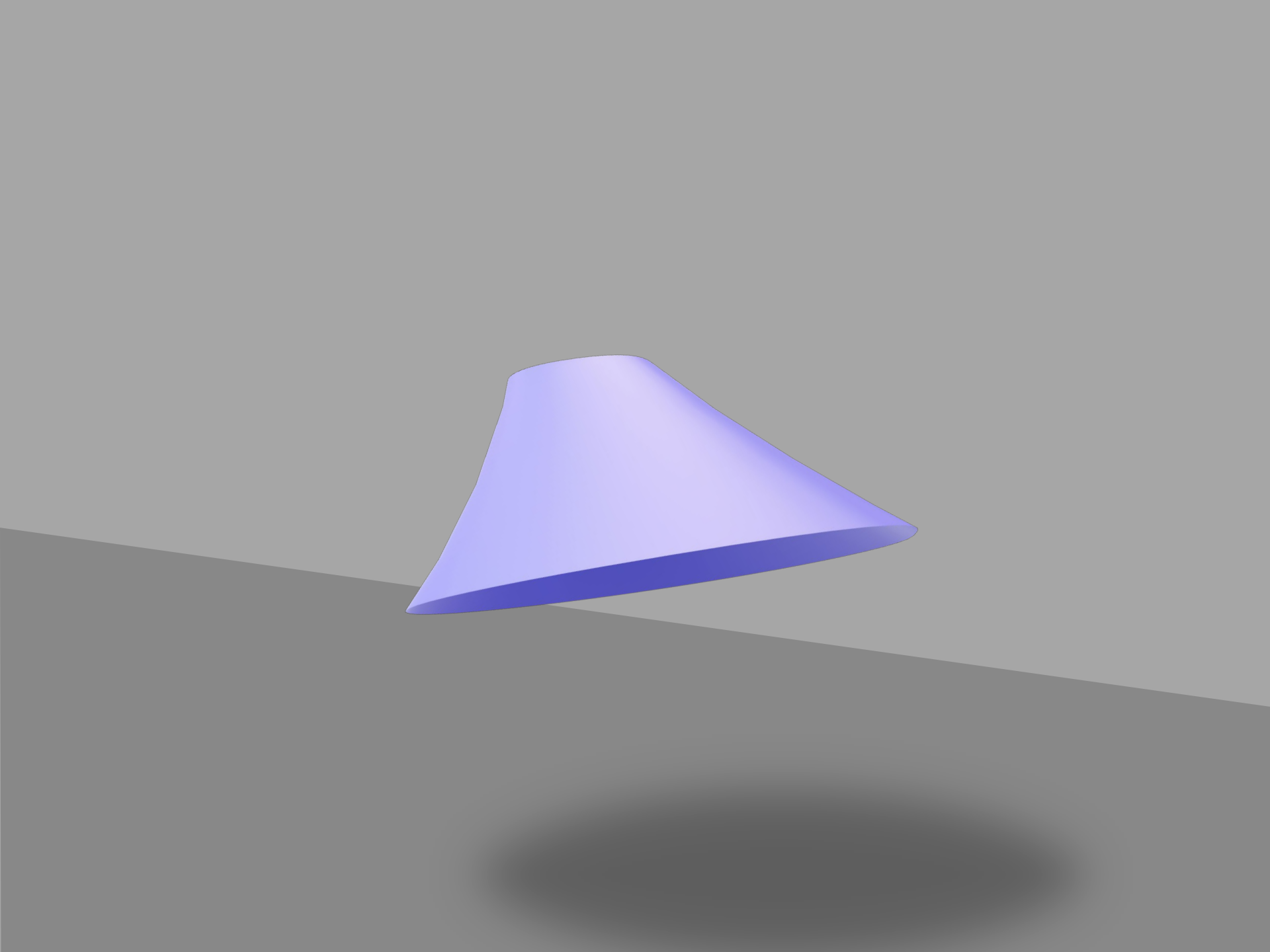
# Round 4

(years 41-50)

# 1. SCIENTIFIC INFORMATION

We have a **NEW MODEL** for climate change...





## 2. DECISIONS

# Robust Option Again Available

### Robust Option

- You are guaranteed a fixed number of prosperity points, no matter how many floods or droughts occur
- But you must give all tokens above that fixed number to the bank
- How many prosperity points would you accept for this robust option?

## 2. DECISIONS

**Make investments for the coming decade**

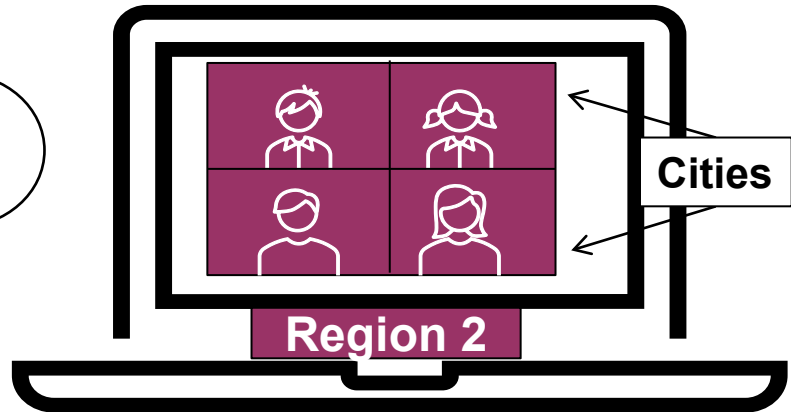
Allocate your 10 tokens or select the robust option.

1<sup>st</sup>



**City**

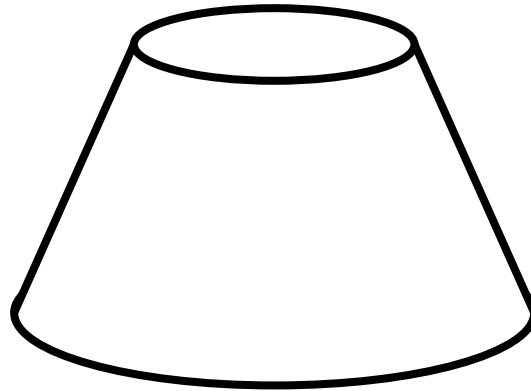
2<sup>nd</sup>



**Region**

# 3. Observations

Ten years of precipitation



*Climate will remain deeply uncertain...*

# Final Results: Decades 1-3 ONLY

City	Decade Number	Crisis	Prosperity Points	Total Crisis	Total Prosperity Points
1	1	0	4	0	12
	2	0	3		
	3	0	5		
	4				
2	1	1	0	1	5
	2	0	3		
	3	0	2		
	4				
3	1	0	3	0	11
	2	0	4		
	3	0	2		
	4				

Region	Decade Number	Crisis	Prosperity Points	Total Crisis	Total Prosperity Points
1	1	0	12	0	36
	2	0	9		
	3	0	15		
	4				
2	1	1	0	1	15
	2	0	9		
	3	0	6		
	4				
3	1	0	9	0	27
	2	0	12		
	3	0	6		
	4				

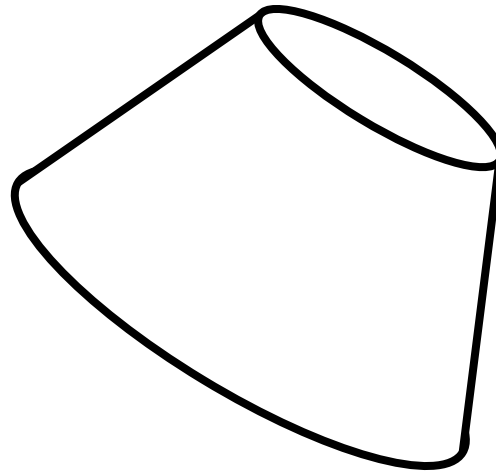


Fewest Crises = City winner!



Most Prosperity Points = Region winner!

**Thank you for playing  
Decisions for the Decade!**





# Credits

Special thanks to

- Michelle Miro and Robert Lempert, RAND
- Pablo Suarez and Janot Mendler de Suarez, Red Cross / Red Crescent Climate Centre)



**THE WORLD BANK**

