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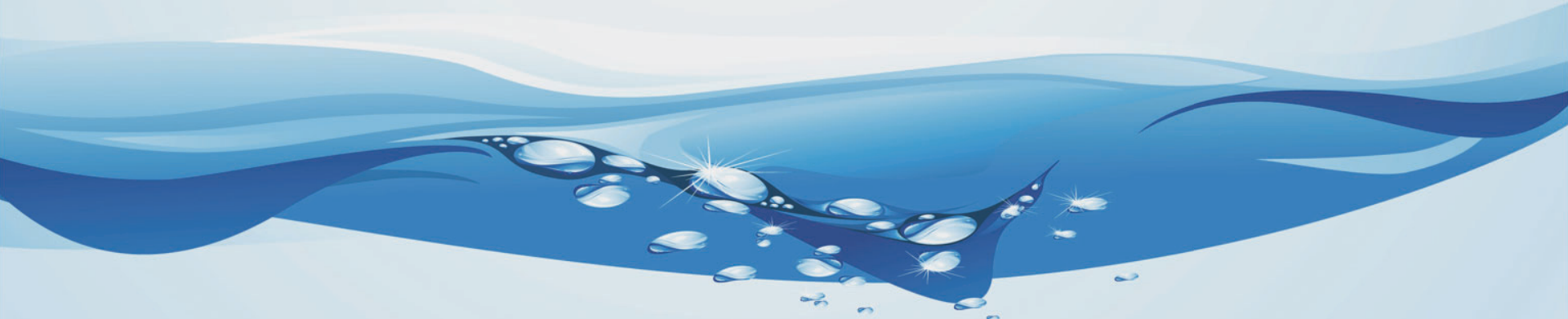
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Learning From The Burning: *Understanding The Urgency*

*A presentation by
R.W. Sandford*

*EPCOR Chair, Water & Climate Security
United Nations University
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The 2018 IPCC Report





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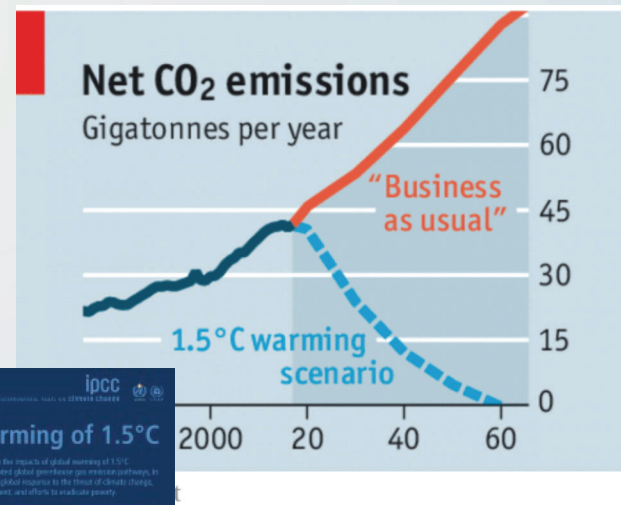
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The 2018 IPCC Report



**Major Climate Report
Just Issued a Dire
Warning, But Everyone's
Going to Ignore It
Anyway**

BY CARLY CASSELLA
OCTOBER 08, 2018





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*Curiously, the most important
climate feedbacks all involve water,
in either its solid, liquid or gas form.*

James Hansen



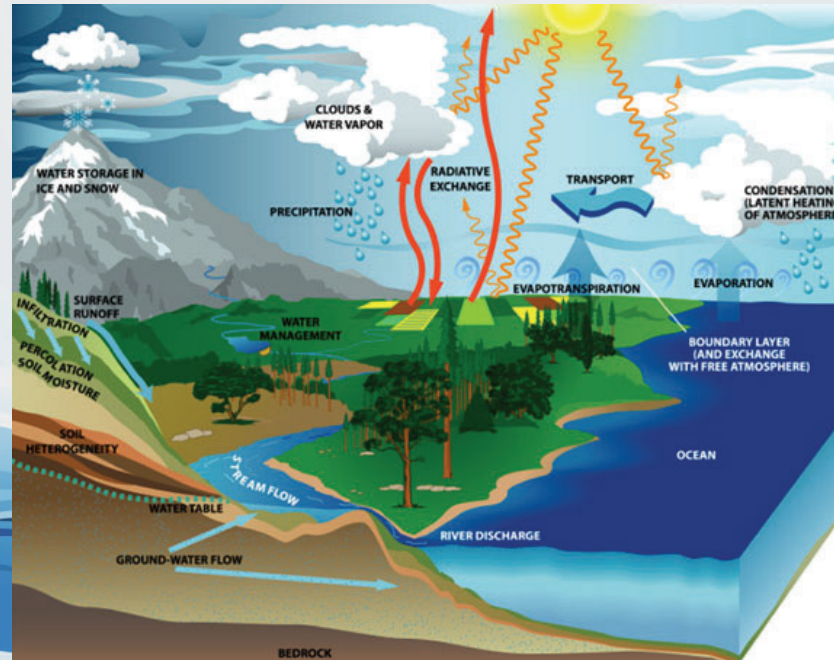


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The Loss of Hydrologic Stationarity



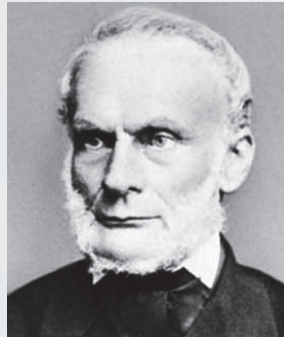


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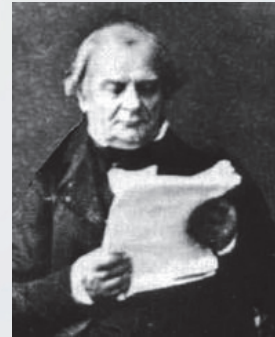
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The Clausius-Clapyron Relation

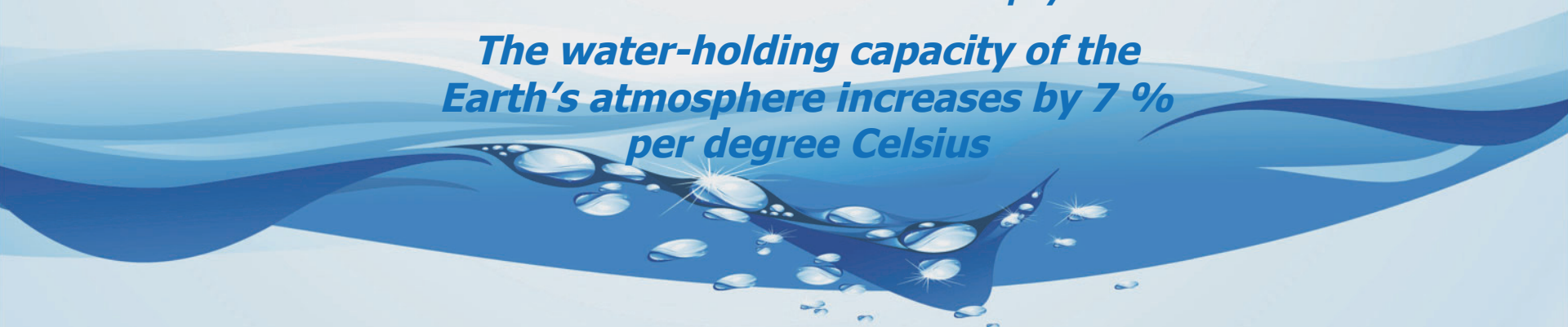


Rudolf Clausius



Benoit Clapeyron

***The water-holding capacity of the
Earth's atmosphere increases by 7 %
per degree Celsius***



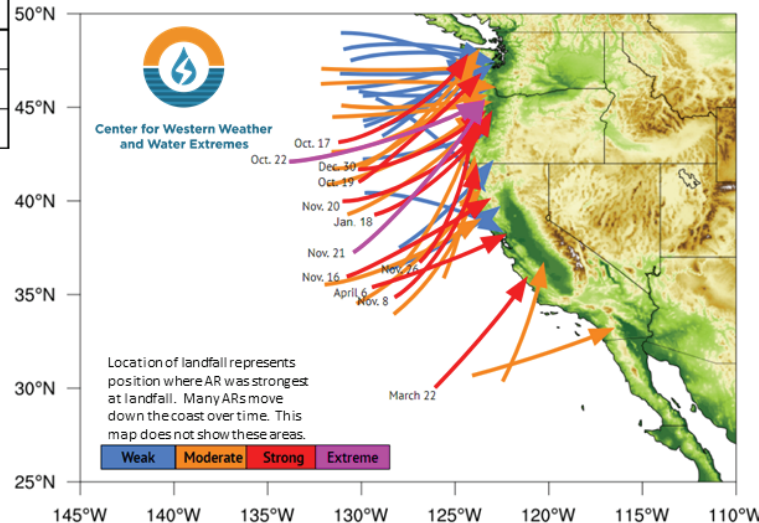


Distribution of Landfalling Atmospheric Rivers on the U.S. West Coast During Water Year 2018 Through April

AR Strength	AR Count*
Weak	16
Moderate	16
Strong	10
Extreme	2
Exceptional	0

- **44** Atmospheric Rivers made landfall on the West Coast during the 2018 water year through April

Ralph/CW3E AR Strength Scale	
■	Weak: $IVT=250-500 \text{ kg m}^{-1} \text{ s}^{-1}$
■	Moderate: $IVT=500-750 \text{ kg m}^{-1} \text{ s}^{-1}$
■	Strong: $IVT=750-1000 \text{ kg m}^{-1} \text{ s}^{-1}$
■	Extreme: $IVT=1000-1250 \text{ kg m}^{-1} \text{ s}^{-1}$
■	Exceptional: $IVT>1250 \text{ kg m}^{-1} \text{ s}^{-1}$



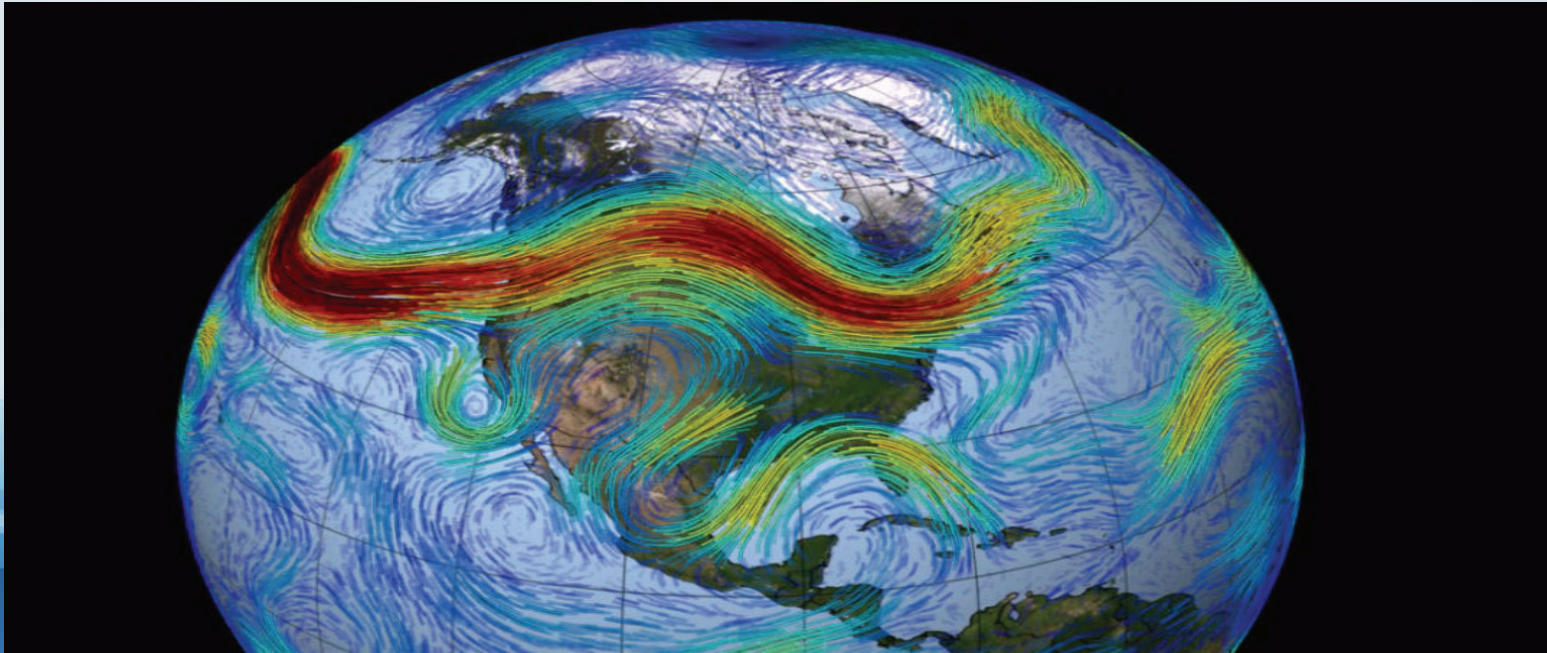


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Follow the Water: The Northern Hemisphere Jet Stream





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Follow the Water: The Northern Hemisphere Jet Stream



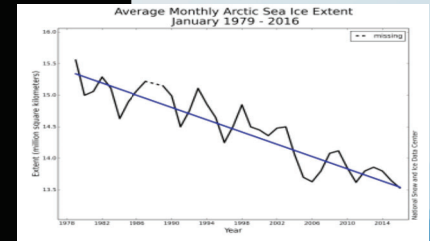
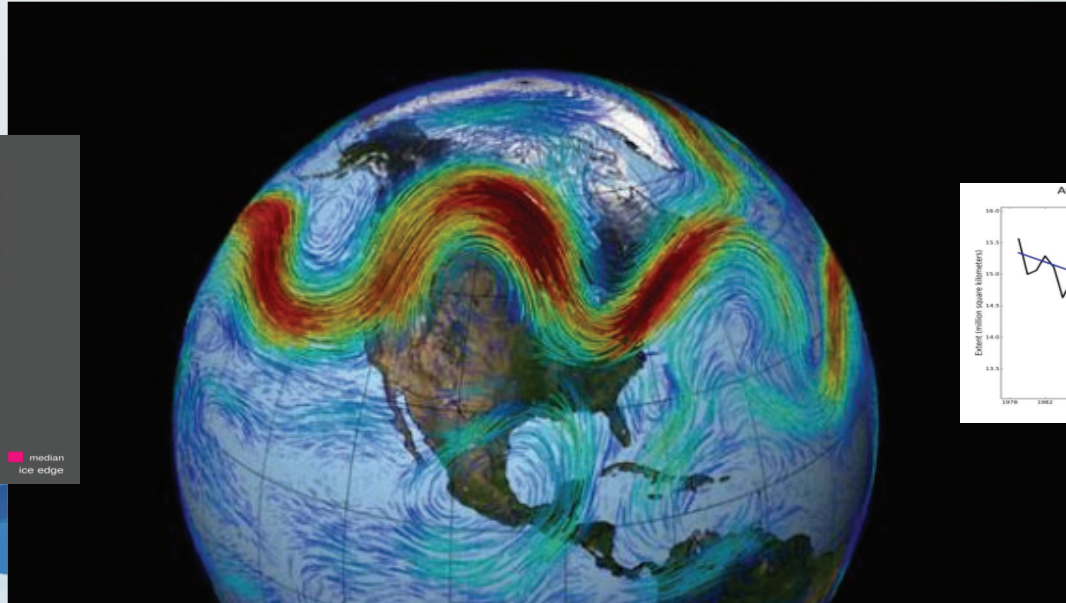
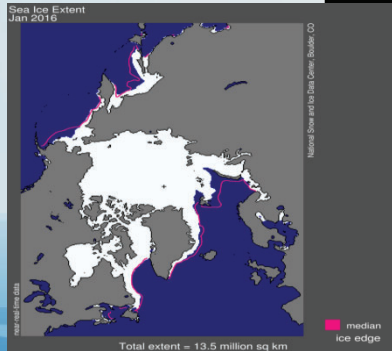


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What we know scientifically: The loss of Arctic sea ice appears to be causing the jet stream to meander.





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Thawing of the Cryospheric Cap: Setting Fire to Water.



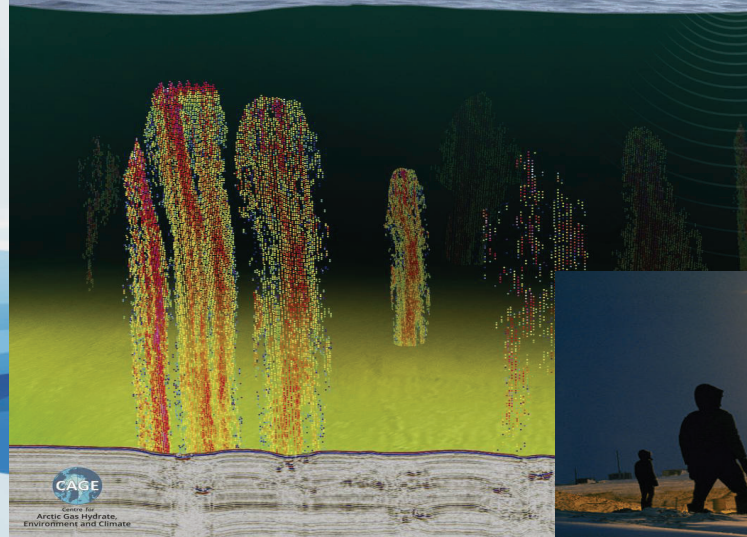


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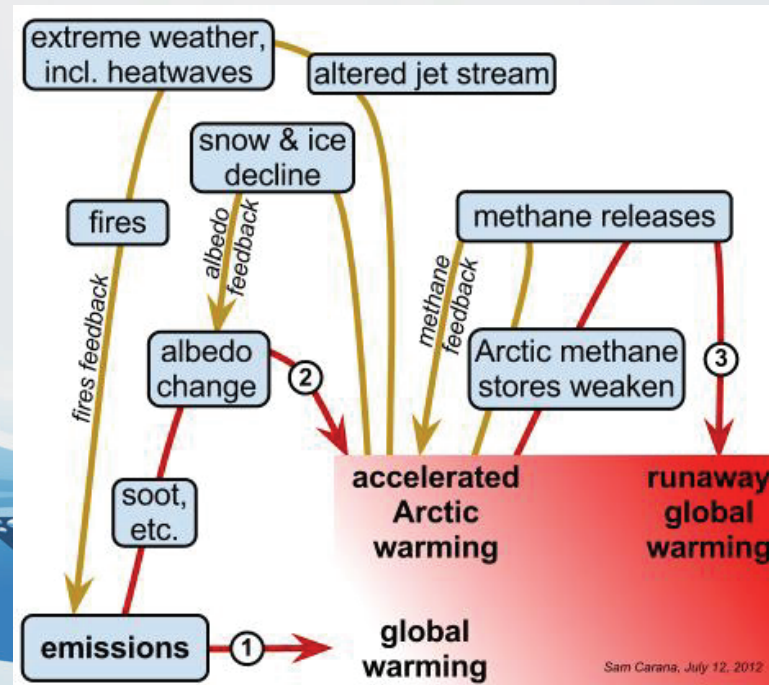
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Arctic Methane Plumes





Follow the Water: Arctic climate warming feedbacks



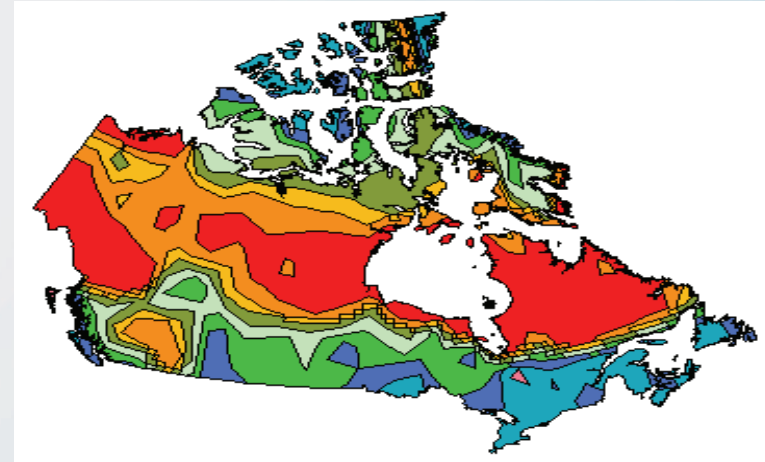
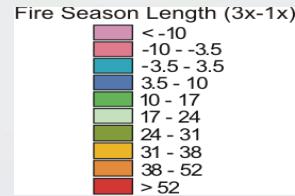
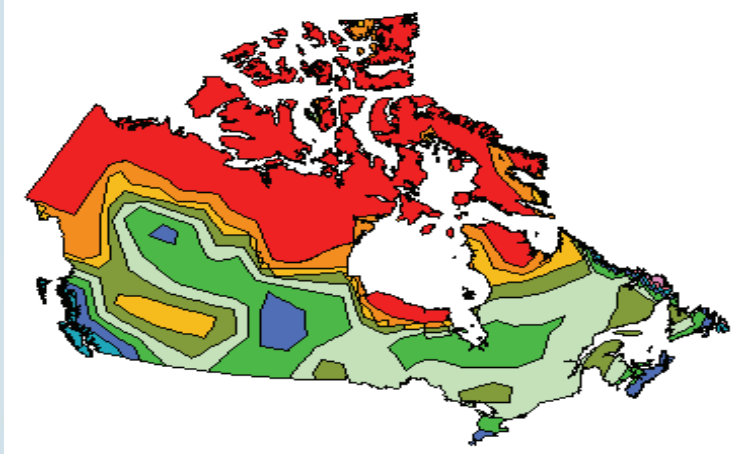
Length of fire season



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CCC -3xCO₂

Hadley -3xCO₂

Fire season length increases by 10-50 days over much of the boreal according to the Canadian and Hadley GCMs



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Follow the Water: Seasonal snow cover



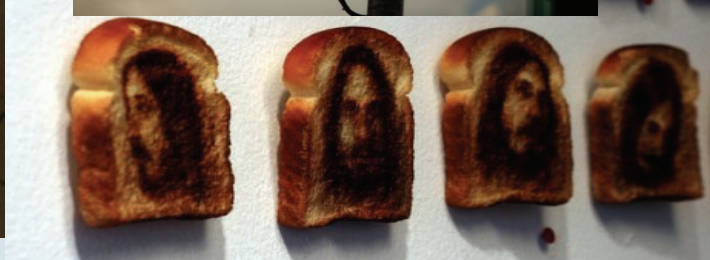


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Avoiding Pariedolia





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Some Like It Hot



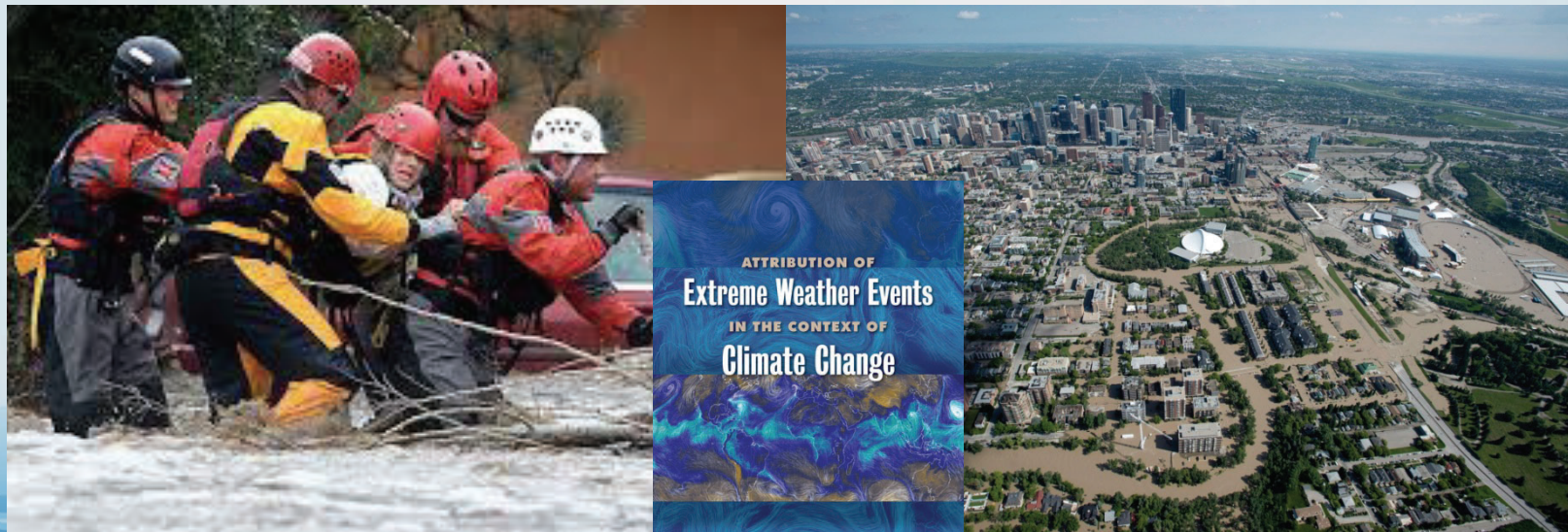


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The Rapidly Developing Science of attribution of climate effects



ATtribution OF

Extreme Weather Events

IN THE CONTEXT OF

Climate Change

The National Academies of
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The Summer the World Change





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Learning From the Burning

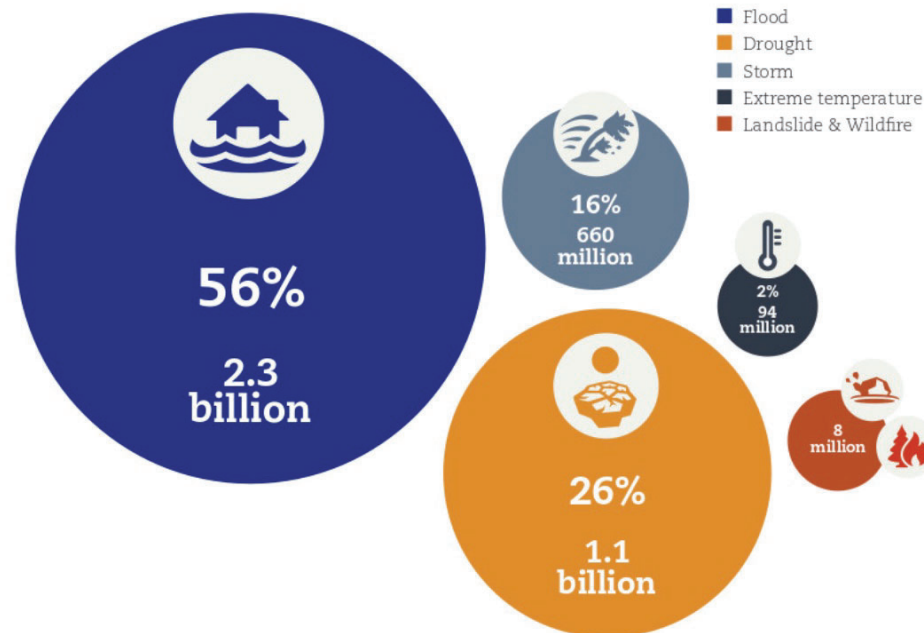




Learning From the Burning

Numbers of people affected by weather-related disasters (1995-2015)

(NB: deaths are excluded from the total affected.)





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Global Water Futures



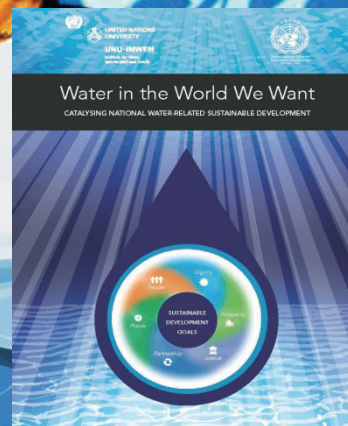


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Learning From the Burning The Restoration Imperative



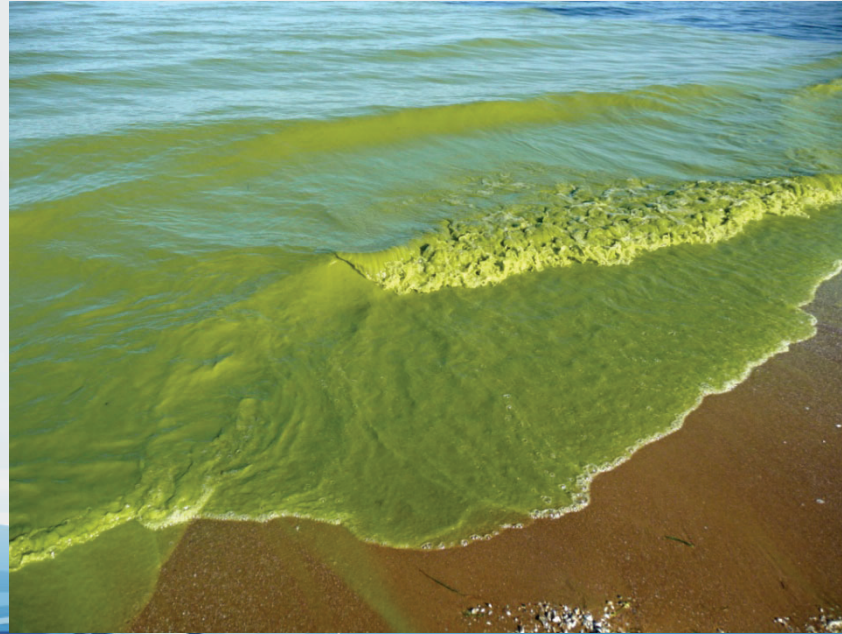


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Towards a Circular Economy





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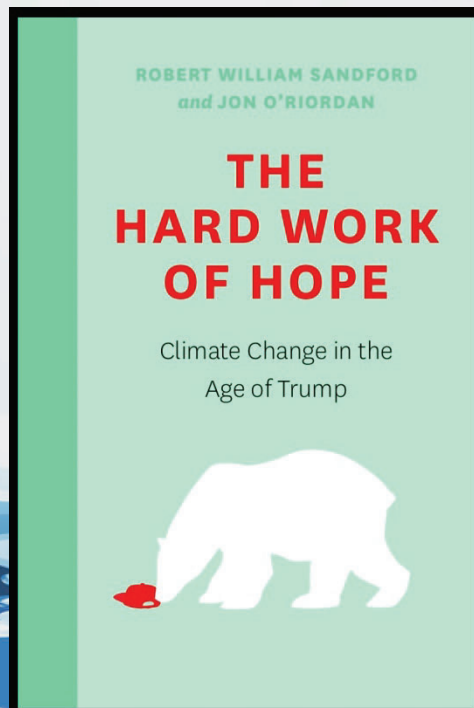


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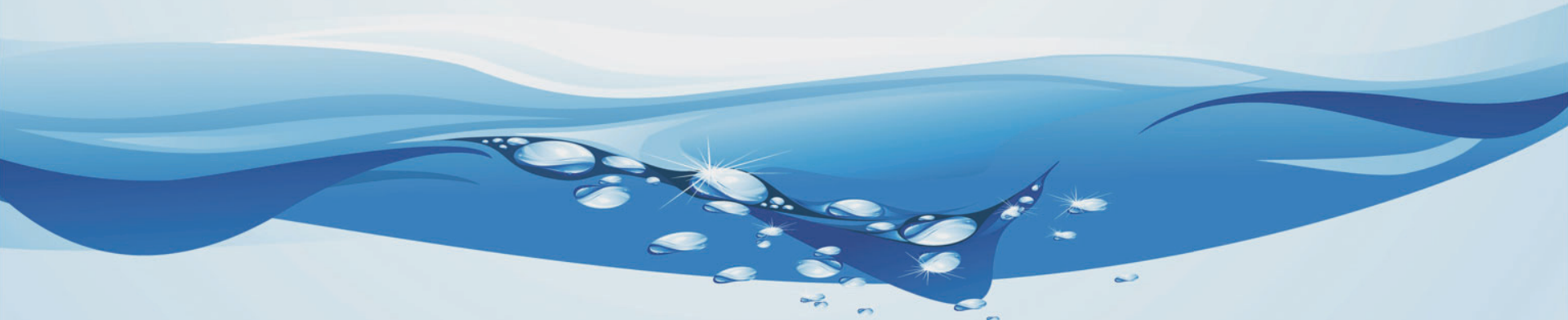
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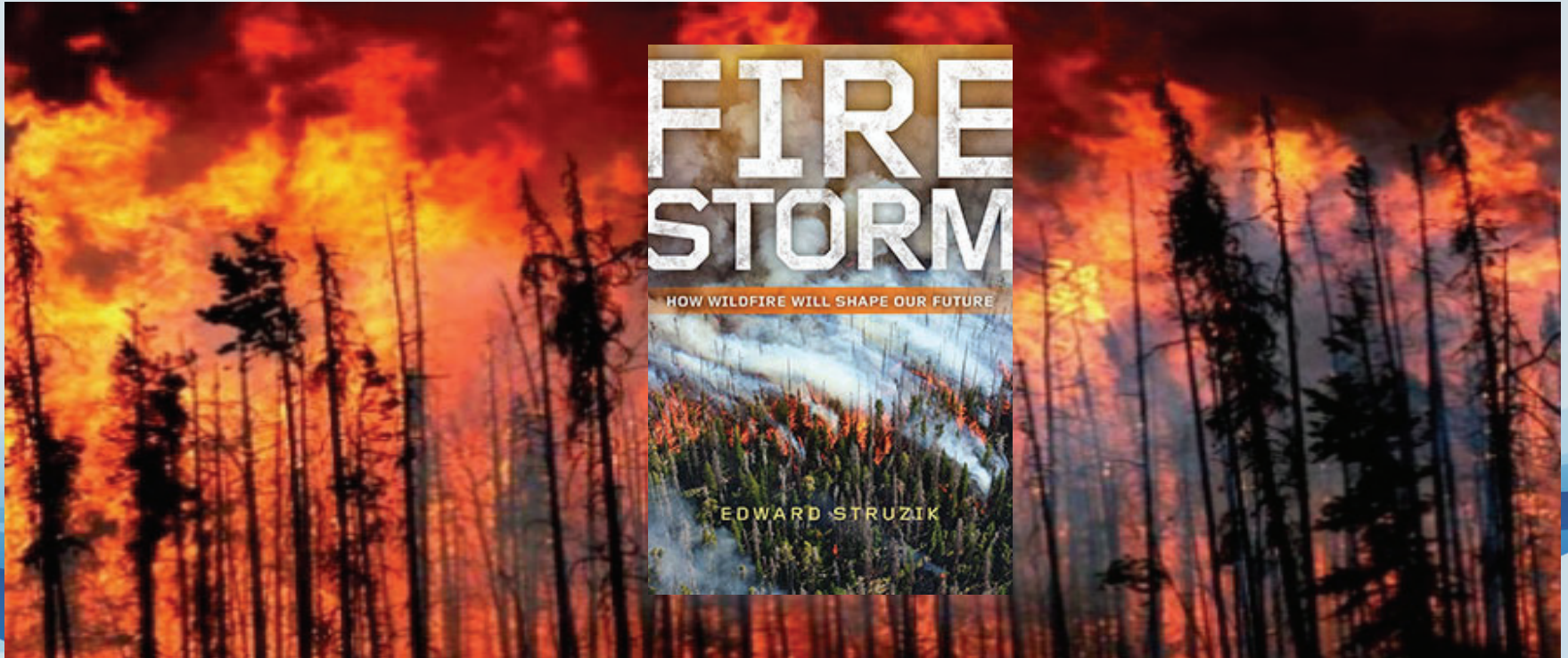


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Learning From the Burning The Restoration Imperative



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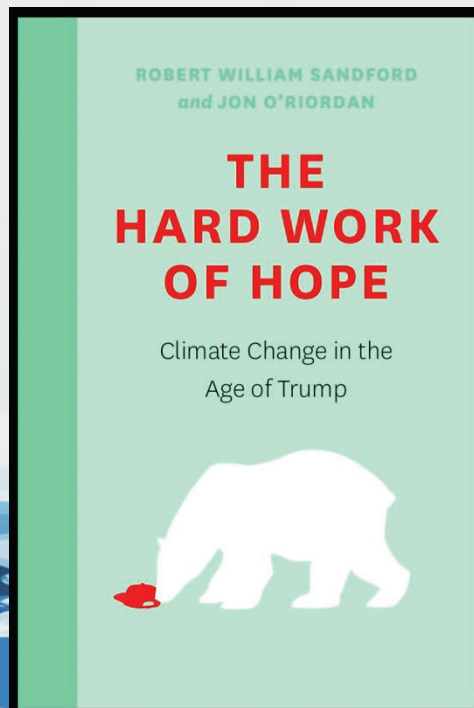


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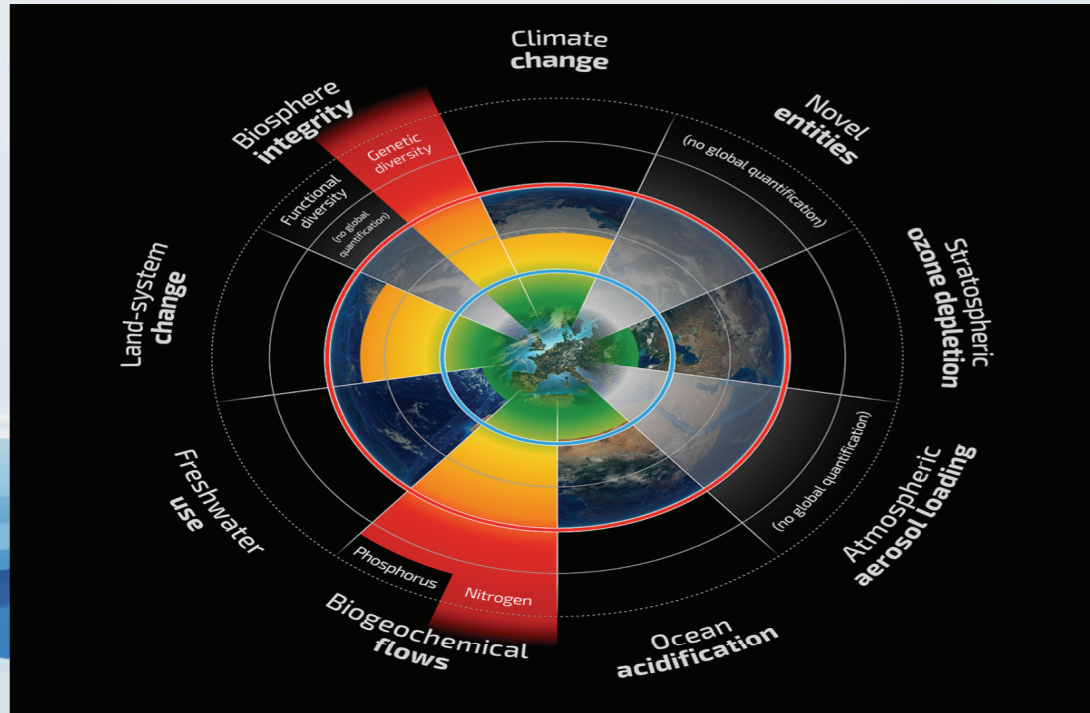


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Learning From the Burning Earth System Boundaries





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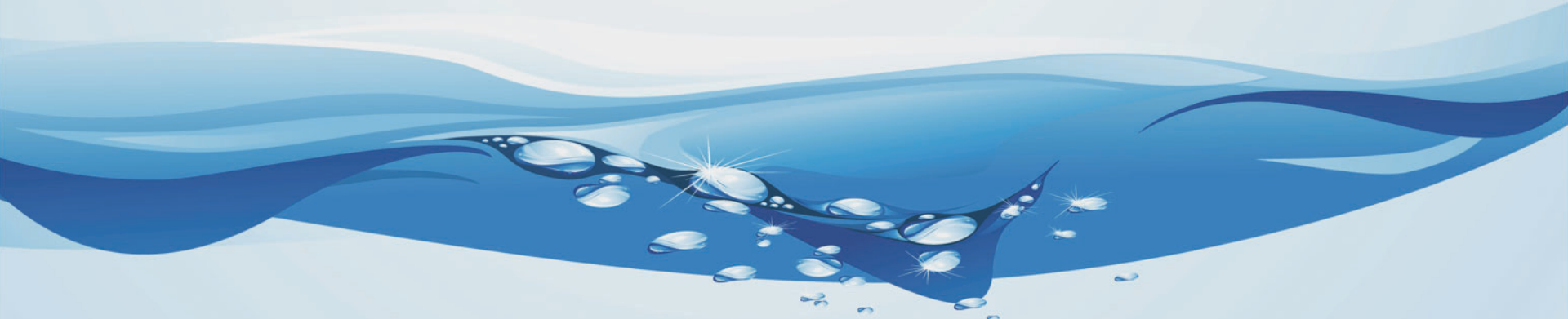
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When attribution becomes possible who pays?





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Is Paris Burning?





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British Columbia 2018



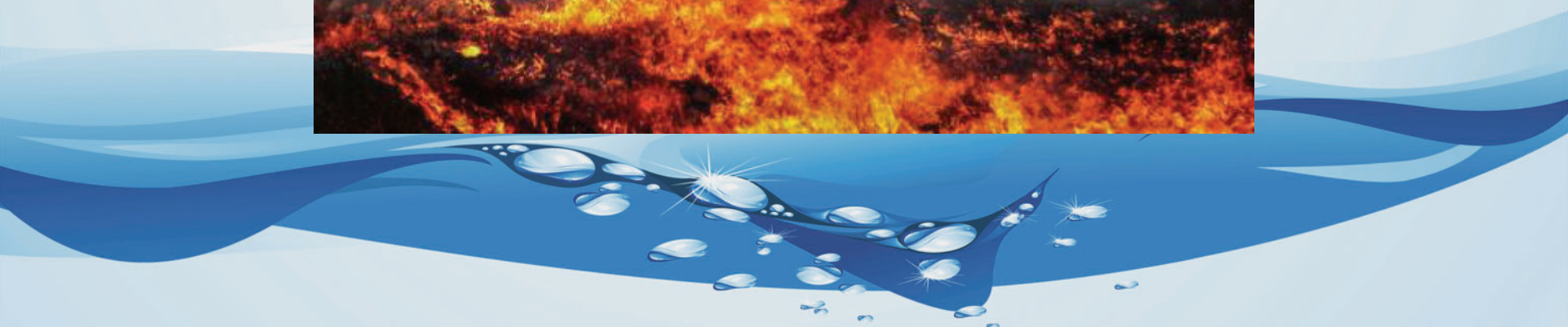


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Heavy Air Pollution May Lower Cognitive Test Scores

A new study found that verbal and math test scores in China dropped with reduced air quality. The effects were especially pronounced for men and elderly populations.

[READ MORE »](#)



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Learning From the Burning

NASA Map Reveals How This Week's Natural Disasters Affect Aerosol Velocity

NASA is tracking even the tiniest specks of matter.

