

MAXIMIZING YOUR AUTOMATION SYSTEM (And WHY)

March 2018



Timothy B. Janos

400+ energy audits
\$150 million in savings

>25% ROI

>200+ seminars on 6 continents

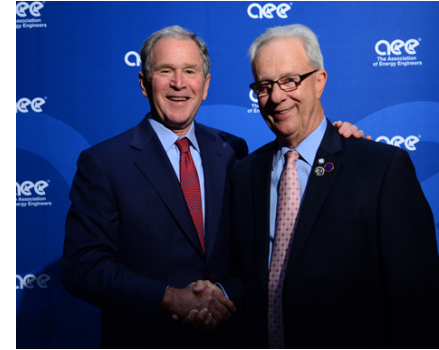
Certification boards (CEM, CEA, CIEP)

Past President of AEE - *90 countries*

Publications



Facility Managers Newsletter



AEE Fellow - Energy Managers Hall of Fame



Training conducted throughout the world





Your Seminar Instructor:

Timothy B. Janos

F.A.E.E., C.E.M., C.E.A., C.I.E.P, C.R.M., C.S.D.P., B.E.P., C.D.S.M., C.E.M.S.C.

- AEE Fellow AEE Hall of Fame
- International President 2006
- Director of Special Projects
- Life Member
- CEM Board Chairman 1994 – 2014
- CEA Board Chairman
- CEM #2024 – 1983
- CIEP Board Chairman



President – Spectrum Energy Consultants
tim@spectrumenergy.net



You have an Energy
Management
System



The Need for Energy Management

Three Major Problems

America has three national priorities that dictate saving energy:

1. Environmental Quality - Reduce global climate change
2. Economic Competitiveness – Reduce costs and create jobs
3. Energy Security – Import or Export

We need an Energy Efficient Economy!



Professional Interest

Energy Management Jobs



- Building/facility/plant energy manager
- Building/facility/plant maintenance manager
- Utility energy auditor/energy analyst
- State/federal agency energy analyst
- Consulting energy auditor and analyst
- ESCO energy auditor and analyst

Driving Factors in Business/Industry

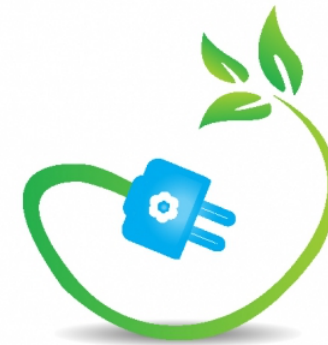
- Environmental regulations
- Product quality improvement
- Productivity improvement
- Energy - relates to the other three



Interface Areas with Energy Management



- Sustainability
- Green buildings
- Renewable energy
- Energy productivity improvement
 - Lean Manufacturing,
 - TQM,
 - Six Sigma
- Greenhouse gas management
- Carbon footprint reduction
- Water conservation



Executive Order 13693

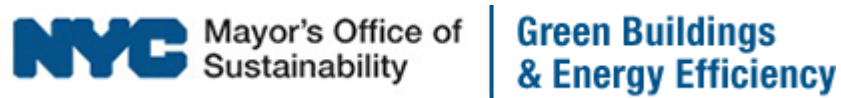
(March 19, 2015)

Federal Facility Mandate to Reduce in GHGs by 40%

- Some Specifics:
 - By 2025- Require 30% of Building Electricity from Renewable Sources.
 - With Incremental Progress Milestones
 - By 2025- Reduce GHG Emissions from Fleets by 30% from 2014 levels.
 - With Incremental Progress Milestones
- Reduce Energy Intensity by 2.5% per year (2016-2025).
- Reduce Water Intensity by 2% per year (2016-2025).

State and Local Governments

- New York 84 – Requires Benchmarking of all buildings



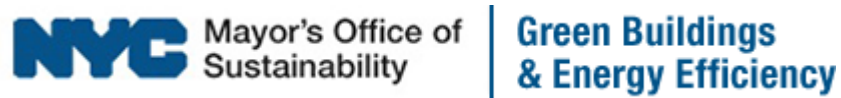
NYC Benchmarking Law

The NYC Benchmarking Law requires owners of large buildings to annually measure their energy and water consumption in a process called benchmarking. The law standardizes this process by requiring building owners to enter their annual energy and water use in the U.S. Environmental Protection Agency's (EPA) online tool, ENERGY STAR Portfolio Manager® and use the tool to submit data to the City. This data informs gives building owners about a building's energy and water consumption compared to similar buildings, and tracks progress year over year to help in energy efficiency planning.

Benchmarking data is also disclosed publicly, analyzed in reports, visualized in the NYC Energy and Water Performance Map, included in energy efficiency policy development efforts such as the Buildings Technical Working Group Final Report, and used to develop free resources such as the NYC Retrofit Accelerator and Community Retrofit NYC to help building owners use less energy and save money.

State and Local Governments

- New York 87 – Requires Auditing and Commissioning



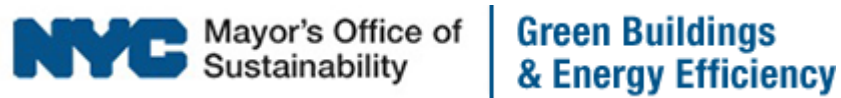
L87: Energy Audits & Retro-commissioning

Local Law 87 (LL87) mandates that buildings over 50,000 gross square feet undergo periodic energy audit and retro-commissioning measures, as part of the Greener, Greater Buildings Plan (GGBP). The intent of this law is to inform building owners of their energy consumption through energy audits, which are surveys and analyses of energy use, and retro-commissioning, the process of ensuring correct equipment installation and performance.

In addition to benchmarking annual energy and water consumption, energy audits and retro-commissioning will give building owners a much more robust understanding of their buildings' performance, eventually shifting the market towards increasingly efficient, high-performing buildings.

State and Local Governments

- New York 88 – Requires Lighting Upgrades and Sub-Metering



L88: Lighting Upgrades & Sub-metering

Lighting in non-residential buildings accounts for almost 18 percent of energy use and greenhouse gas emissions in New York City buildings. Dramatic improvements in lighting technology over the past two decades have made it feasible to significantly reduce energy consumption by installing more efficient lighting systems that can yield significant cost savings.

Additionally, many buildings depend on a single meter to monitor electricity consumption, and as such, bill non-residential tenants a standard rate regardless of the tenant's actual consumption. Individual tenants would likely reduce their energy consumption if energy use information were made available to them regularly. Local Law 88 of 2009 (LL88), part of the Greener, Greater Buildings Plan (GGBP), brings together requirements for both lighting upgrades and sub-metering that will help buildings achieve significant energy savings



City of Chicago

Mayor Rahm Emanuel

Chicago Energy Benchmarking Homepage

NEW! 2017 Chicago Energy Benchmarking Report & Data Release

On February 9, 2018 the City of Chicago released its 2017 Chicago Energy Benchmarking Report and Infographic. The City also posted energy data for over 2,700 properties, as authorized under the Chicago Energy Benchmarking Ordinance. [Click here](#) to read the report or 1-page Infographic, and to review the data release for 2017 and for all previous years.

Chicago Energy Rating System

On November 21st, 2017, the Chicago City Council approved updates to the Chicago Energy Benchmarking Ordinance in order to improve the visibility and transparency of the reported information, while also making the information easier to understand. A summary of the changes and some of the benefits are provided in this summary, and this FAQ document provides answers to frequently asked questions. [The full ordinance can be downloaded here.](#)

In summary, the updates will create a new Chicago Energy Rating system starting in 2019 for buildings required to benchmark. Properties in compliance with benchmarking reporting will receive between one and four stars on a four-star rating system, based on their 1-100 ENERGY STAR score. Properties with one, two, or three stars will be able to earn an additional star if they have improved by at least 10 points in the past two reporting years. Building owners will be required to post their rating in a prominent location, and to share the rating at time of listing the property for lease or sale. The new rating system goes into effect in 2019.



Building Monitoring System

You cannot manage what you don't measure, and what you don't manage can cost you. This is one reason the Alaska Housing Finance Corporation (AHFC) developed a free open source building monitoring system that measure real-time energy use and provides a complete summary of operating performance. The system is able to track building occupancy, temperature, electricity, and fuel use as well as access data from multiple sources, including established weather stations, building automation systems, databases, and other points.

AHFC realized close to 18% energy and cost savings after installing a building monitoring system on their Anchorage office building. To explore the AHFC near real-time building data visit <https://bms.ahfc.us>.

To learn more and access the free building monitoring system source code and detailed installation instructions visit <https://code.ahfc.us/energy/bmon>.

Energy Management Definition

Energy Management: the use of engineering and economic principles to control the cost of energy to provide needed services in buildings and industries.

Energy cost reduction results from:

- Improvements in energy efficiency,
- Changing patterns of energy use,
- Shifting to other sources of energy.



The Bottom Line:

Why Do Energy Management?

- Direct \$\$ Savings, very often with Low Risk, and...
- Many Non-Utility Benefits:
 - Maintenance, Material & Labor Savings
 - Improved Building Value
 - Better Cost-Competitiveness
 - Often, the Project ROI > Company's Profit Margin
 - Often, the Project ROI > Cost of Finance
 - Improved "Green", "Sustainable" Image
 - Boost Sales and/or Employee Recruitment
 - Reduced Pollution in OUR Environment
 - Ability to Meet Supplier/Govt. Requirements

Typical Energy Savings

- No-cost actions and maintenance
 - 5 to 15 percent savings
- Low-cost or short payback actions
 - 15 to 30 percent savings
- Higher-cost or longer payback action
 - 30 to 50 percent savings



GLOBAL ENERGY TRENDS 2018



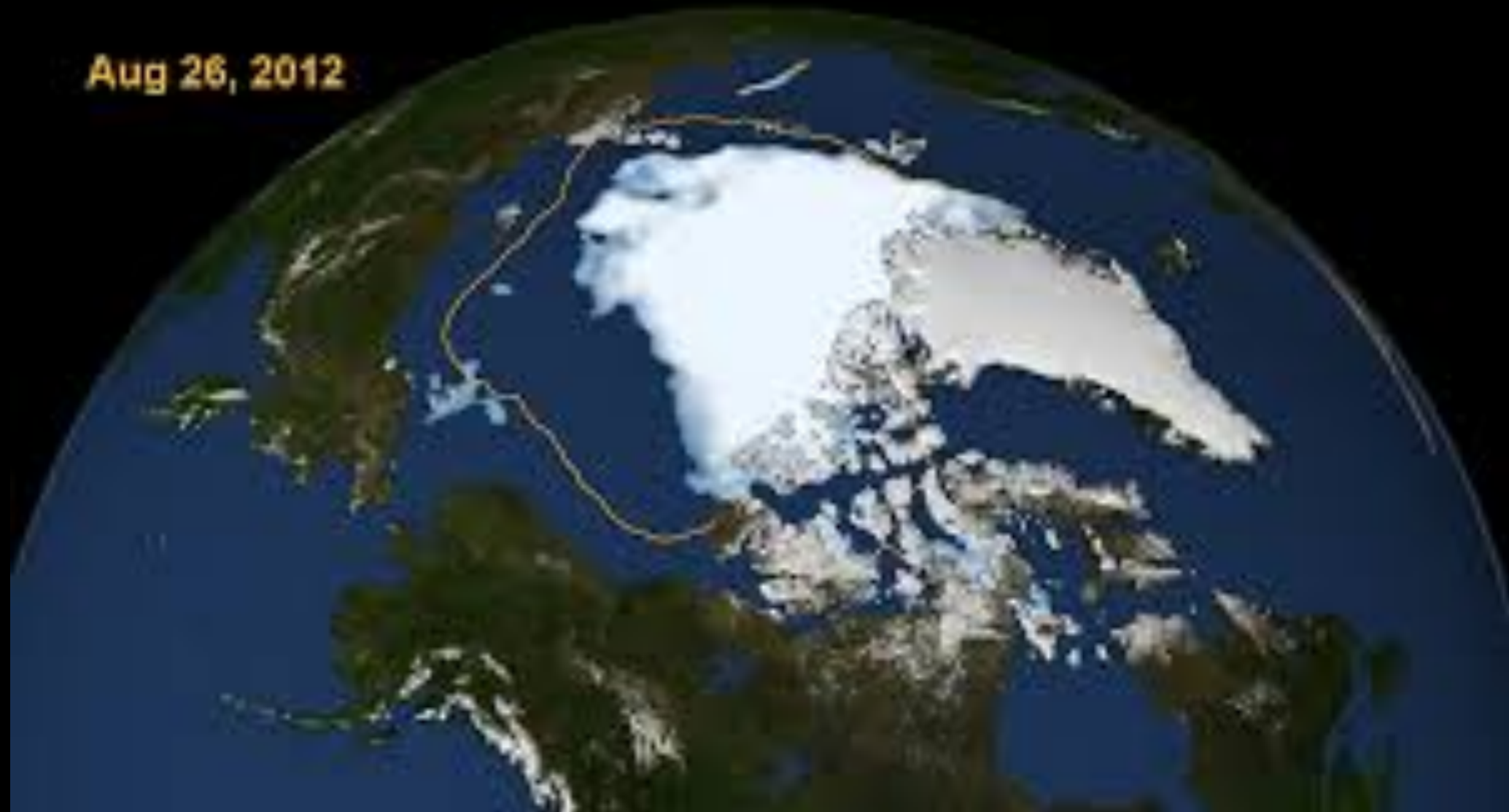
Energy-Environmental-Economic Challenges

A satellite view of Earth showing the Western Hemisphere, including North and South America, the Atlantic Ocean, and the Pacific Ocean. The text "THERE IS NO PLANET B" is overlaid in white, bold, sans-serif font across the center of the globe.

**THERE IS NO
PLANET B**

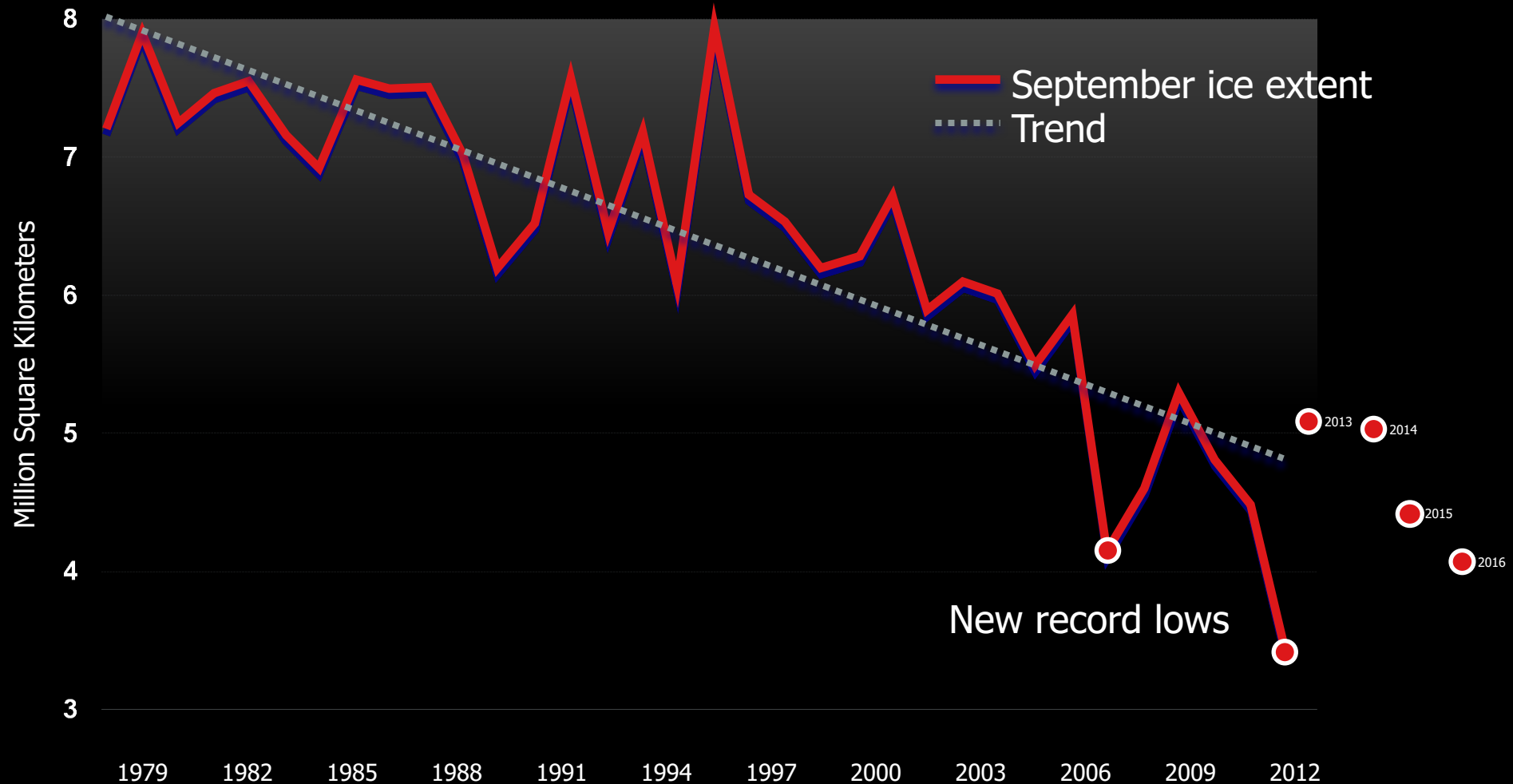


Aug 26, 2012



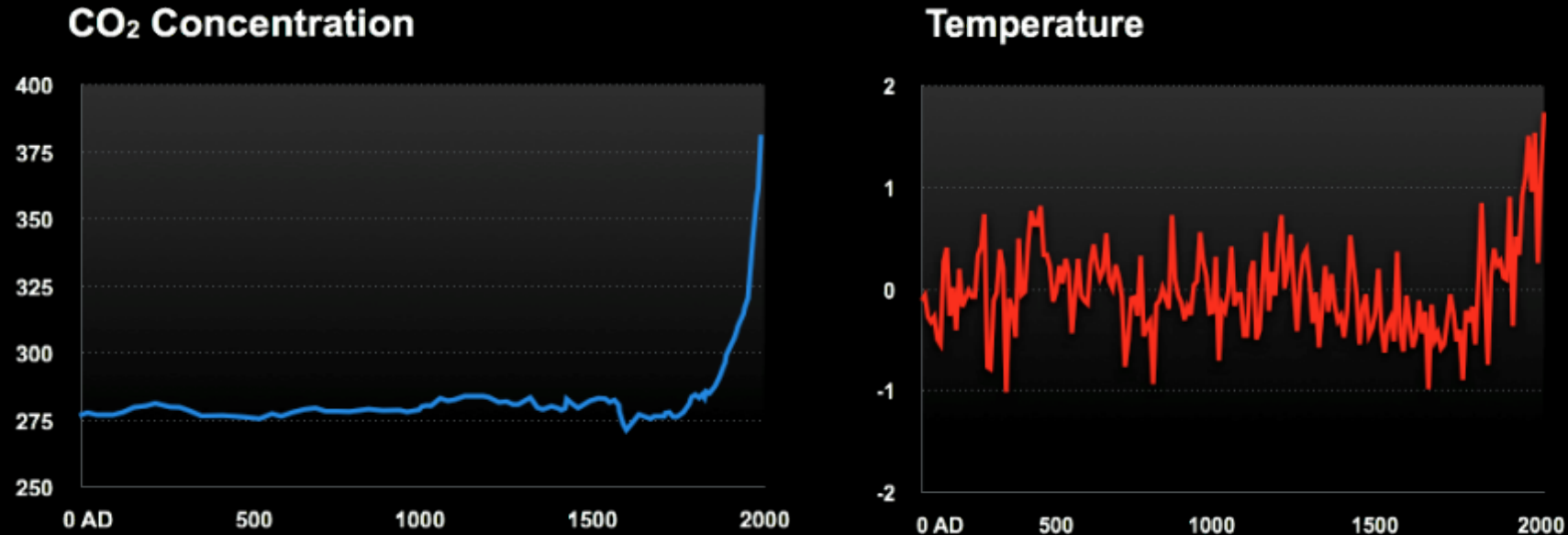
September Arctic Sea ice extent

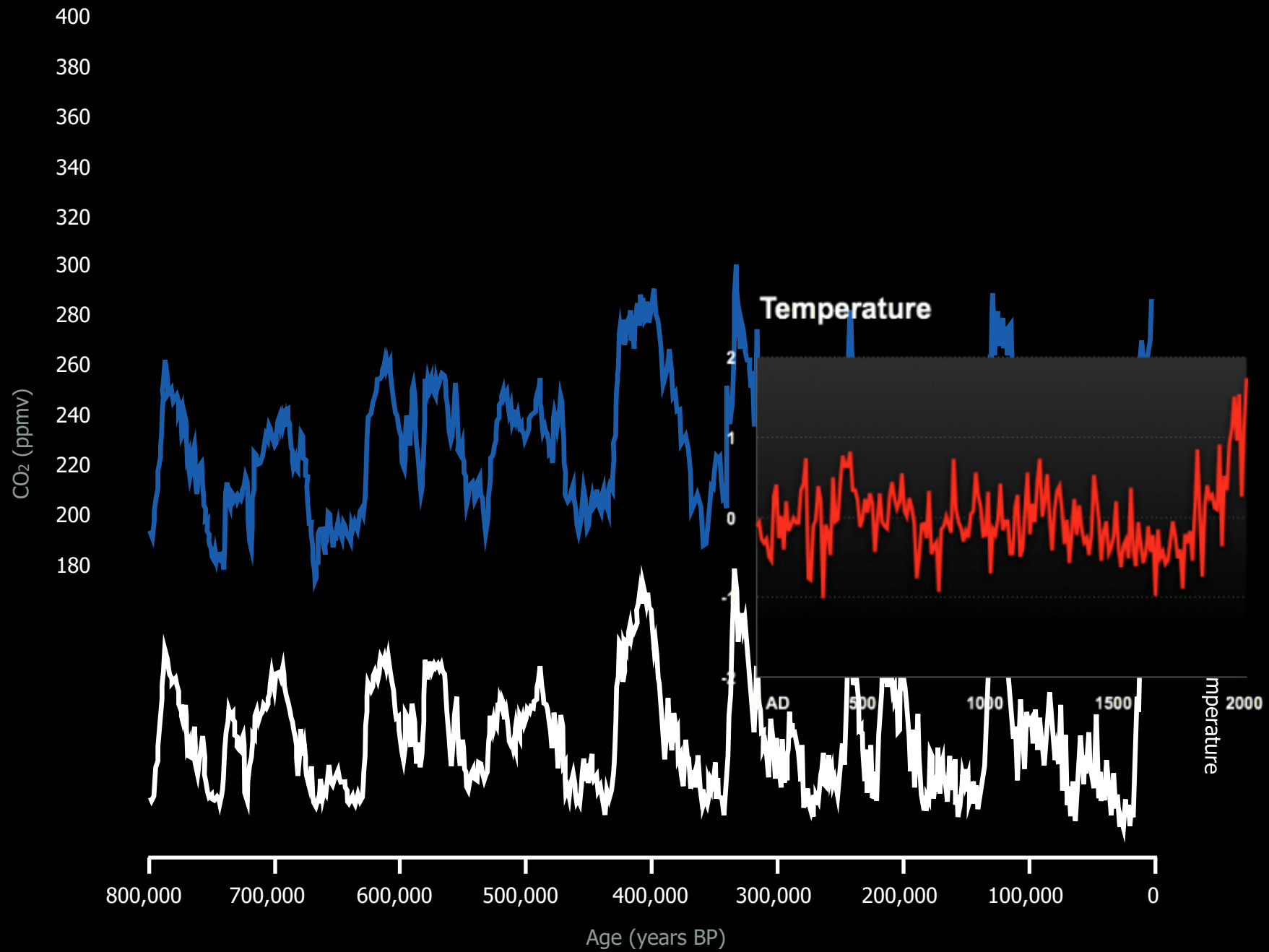
1979 – 2016

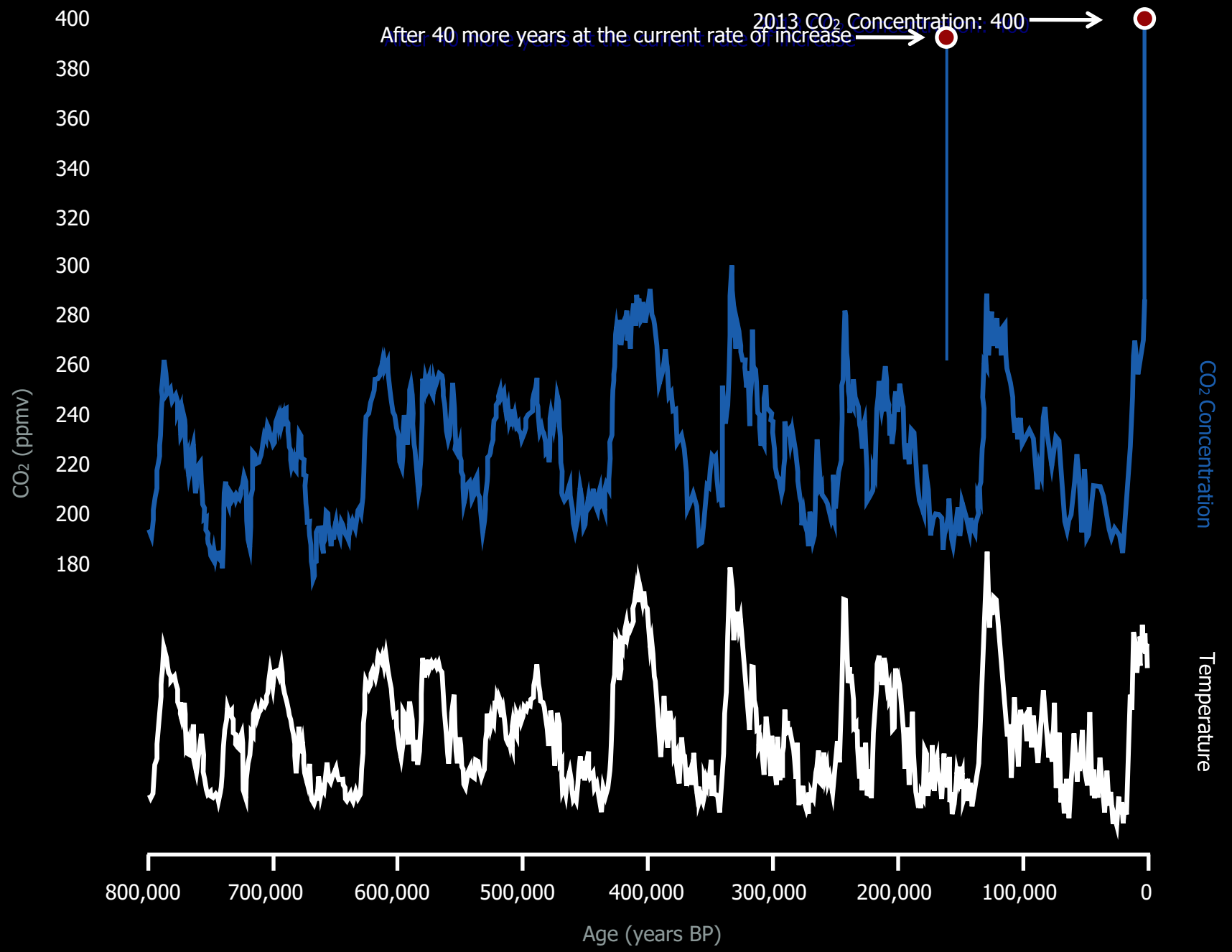


As CO₂ Increases, So Does the Temperature

2000 Years of CO₂ and Global Temperature



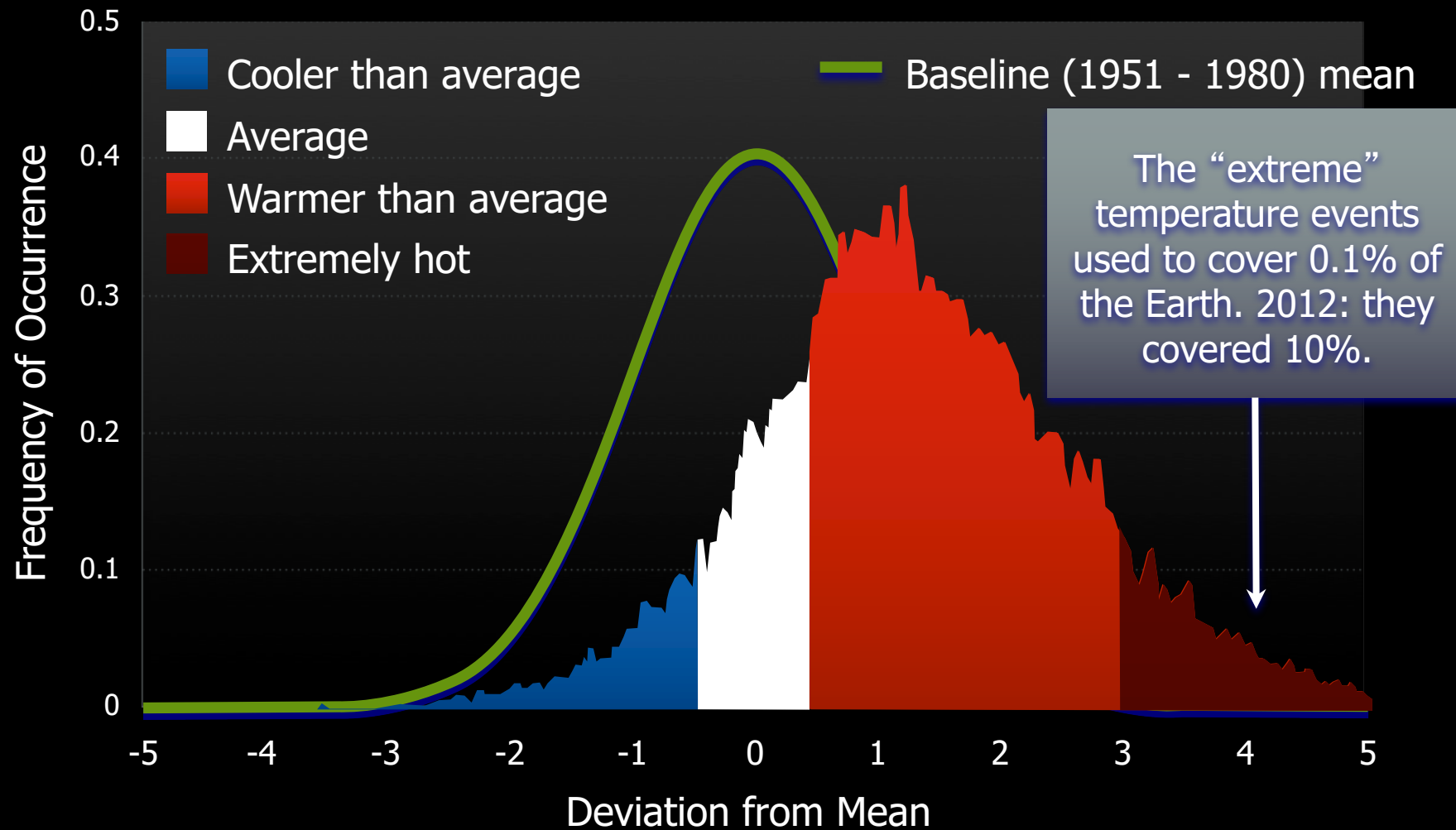




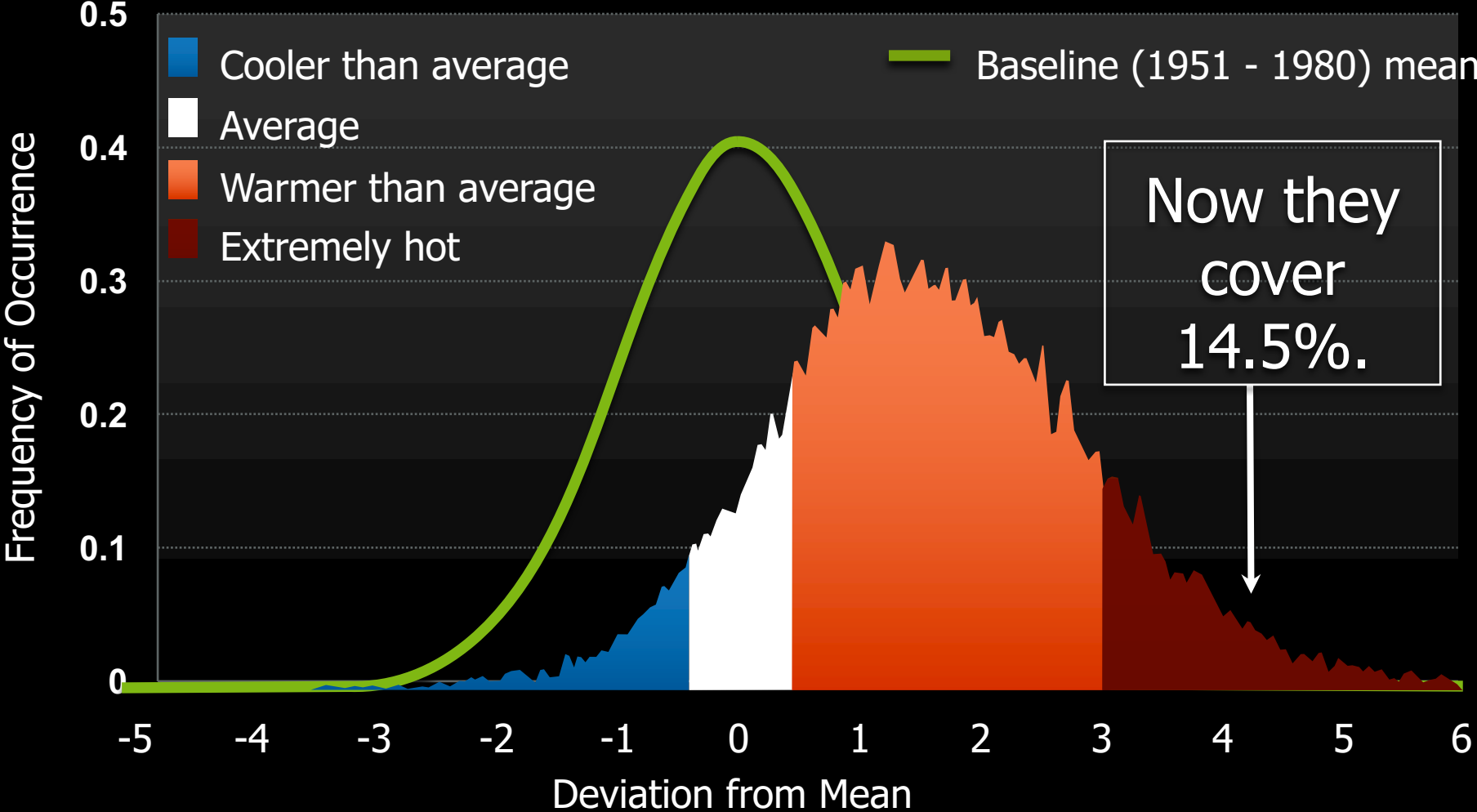
Source: National Climatic Data Center, NOAA

2017 was the **41st** consecutive year with
a global temperature above
the 20th century average

Summer temperatures have shifted



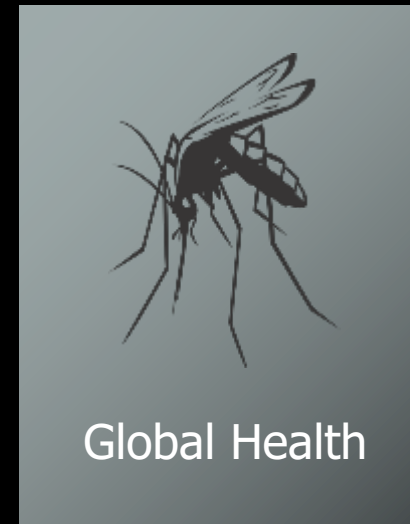
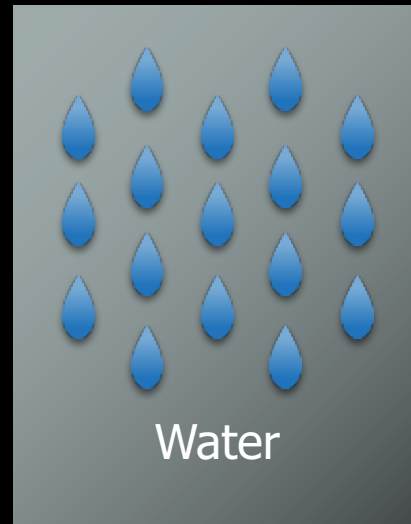
Look at last 10 years... 2005 to 2015...



Source: Hansen, et al., "Perceptions of Climate Change," Proc. Natl. Acad. Sci. USA 10.1073, August 2012 – Updated 2016

Global systems vulnerable to climate

Disruptions ~ Political/societal
instability



There is already 4% more water vapor over the oceans than there was only 30 years ago



I-10 near Houston August 2017



We have lost
more than
half
of the animals on
our planet
in the last 40
years

Source: WWF, *Living Planet Report 2014*



Coral bleaching

- Great Barrier Reef, Australia



The 2015–2016 bleaching event is the worst ever recorded on the Great Barrier Reef.

Tropical diseases on the move



The Vatican



Pay-as-you-go solar power

Low initial costs
make small solar
systems affordable
in developing
countries

Photo courtesy Azuri Technologies

Nimule, South Sudan



End of This Module

**Any
Questions?**

