Climate Change & Dermatology: What can you do?

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Disclosures / Conflicts

• I have no relevant conflicts or disclosures

Goals

• Provide some actionable items for you
LAST WEEK: February 23
Philadelphia
Clear
68°

Thursday Today
Now 7PM 8PM 9PM 10PM 11PM 12AM
68° 65° 62° 61° 58° 57° 57°

Friday 72 55
Saturday 70 35
Sunday 46 34
Monday 57 42
Tuesday 63 52
Wednesday 67 44
Thursday 51 35

It's so warm out!

BUT IT'S WINTER

Nice to be outside...

IT'S NOT NORMAL

Lovely day.

THE EARTH IS DYING

© Sarah Andersen
Mapping global temperature changes: every year from 1850 to 2016

U.S. Daily Records Summary

<table>
<thead>
<tr>
<th>PERIOD</th>
<th>HIGH MAX</th>
<th>HIGH MIN</th>
<th>LOW MAX</th>
<th>LOW MIN</th>
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<tr>
<td>Last 7 Days</td>
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<td>1056</td>
<td>114</td>
<td>68</td>
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<td>Last 30 Days</td>
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<td>6119</td>
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<td>Month to Date</td>
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<td>5070</td>
<td>185</td>
<td>95</td>
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<tr>
<td>Year to Date</td>
<td>8337</td>
<td>8842</td>
<td>1577</td>
<td>1230</td>
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U.S. All Time Records Summary

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<th>HIGH MIN</th>
<th>LOW MAX</th>
<th>LOW MIN</th>
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</thead>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Last 30 Days</td>
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<tr>
<td>Year to Date</td>
<td>0</td>
<td>1</td>
<td>5</td>
<td>6</td>
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How Much Warmer Was Your City in 2015?

By K.K. REBECCA KAI FEB. 19, 2016

Scientists declared that 2015 was Earth’s hottest year on record. In a database of 5,400 cities provided by AccuWeather, about 90 percent of them were warmer than normal. Enter your city in the field below to see how much warmer it was last year. RELATED ARTICLE

Temperature Average: 59.1° ▲ 2.2° above normal
°F °C


Bars represent range between the daily high and low. Record high: Actual high and normal range. Record low: Actual low.
<table>
<thead>
<tr>
<th></th>
<th>2010</th>
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<tr>
<td>Climate</td>
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<tr>
<td>Diarrheal Infections</td>
<td>85,000</td>
<td>150,000</td>
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<tr>
<td>Heat &amp; Cold Illnesses</td>
<td>35,000</td>
<td>35,000</td>
</tr>
<tr>
<td>Hunger</td>
<td>225,000</td>
<td>380,000</td>
</tr>
<tr>
<td>Malaria &amp; Vector Borne Diseases</td>
<td>20,000</td>
<td>20,000</td>
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<tr>
<td>Meningitis</td>
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<td>40,000</td>
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<td>Environmental Disasters</td>
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<td>7,000</td>
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<tr>
<td>Carbon</td>
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<tr>
<td>Air Pollution</td>
<td>1,400,000</td>
<td>2,100,000</td>
</tr>
<tr>
<td>Indoor Smoke</td>
<td>3,100,000</td>
<td>3,100,000</td>
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<tr>
<td>Occupational Hazards</td>
<td>55,000</td>
<td>80,000</td>
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<tr>
<td>Skin Cancer</td>
<td>20,000</td>
<td>45,000</td>
</tr>
<tr>
<td>World</td>
<td><strong>4,975,000</strong></td>
<td><strong>5,957,000</strong></td>
</tr>
</tbody>
</table>
What can you do?
Support organizations that make a difference

• Climate Defense Fund
• Citizens Climate Lobby
• Union of Concerned Scientists
• World Wildlife Fund
• Nature Conservatory
• Natural Resources Defense Council
• Environmental defense fund
• 350.org
• Sierra Club
• And more... http://morethanscientists.org/get-involved/
Invest and Divest?

• Divestment is controversial
  • The economics involved are beyond the scope of this talk
  • Many suggest advocating for a Carbon Tax is better

• Investment
  • There are some funds designed around green/renewable energy
  • I am hesitant to make any specific recommendations ...
    ... come talk to me if you want to hear some details

• Purchase carbon offsets
  • Climate Action Reserve can help check the quality of offsets
Engage and speak up

• There are too many examples of climate scientists being bullied or quieted by government
  • Bush era website deletions, prior government in Canada, and within 1 hour of the Trump inauguration the White House and .gov websites began removing references to climate

• Contact your representatives & say this is an important issue

• Engage with patients
  • When you see a seasonal eruption out of place, say so!
    • Lyme in Maine, or Canada?
    • Expanding range of Coccidioidomycosis?
    • “Tropical” illnesses in Texas, Florida, and beyond?
    • Sun burn in February from 80 degree days?
Practical things you can do

Many changes are easy, low cost – and can save money

• Choose a utility company that generates power from wind/solar (Green-e Energy is an organization that certifies)
• Make your home / office more energy efficient (can claim federal tax credits)
  • Energy-efficient appliances (Energy Star label)
  • Better bulbs: LEDs use up to 80% less energy (and are cheaper!)
• Improve electricity
  • Turn off lights as you leave – and turn off computers and electronics
  • Use power strips to curb “vampire” appliances
• Change your office culture
  • No more Keurig/K-cups
  • Switch from Styrofoam cups to paper cups... or buy everyone a personal mug

NRDC.org
Personal changes you can make

- Alter your diet
  - 10% of US energy goes into food; 40% of that is wasted
  - Buy local – join a farm-share, and buy fresh (frozen food uses 10x as much energy)
  - Livestock is very resource-intense
    - Every bit helps; less beef is easy and makes a big difference
    - Meat eaters contribute 2x as much warming as vegetarians
    - Beef leads to 5x the pollution and 28x the land/water use as chicken
- Pay attention to the little things
  - Disposable chopsticks lead to 4 million trees harvested per year
  - Estimated 1 trillion non-biodegradable plastic bags per year
- Improve home efficiency
  - Insulate home, seal cracks, and upgrade windows (double glazed save 70% energy)
  - Use fans during the summer, and keep it 2° cooler in winter (bundle up) = 2000 lbs of CO₂/year
  - Insulate pipes and water heater (and set water heater to 55-60°C)
  - Upgrade appliances, especially refrigerators, to energy efficient (Energy Star) versions
  - LED bulbs use 15% the power, last longer, and can save hundreds of dollars over their life
- Recycle: recycling ½ of your waste can save 2 tons of CO₂/year
- Conserve water: fix leaks, shower faster, use low-flow toilets, turn off water while brushing/shaving
- Plant a garden, or a tree

Bigger changes to consider: Cars and Planes

• Change your commute
  • Bike or walk
  • Public transportation
  • Buy a fuel-efficient car (hybrids or electric vehicles)
    • Keep it tuned up – inflated tires and air filters are easy (and can boost mpg by 4-40%)

• Fly less
  • Average American generates 19 tons of CO$_2$ / year; one cross-country flight generates equivalent of 2-3 tons
  • Can we reorganize scientific meetings – Skype/Facetime/Google
  • Can we revamp Residency Applicant Interview season travel
  • Take a train trip or road trip for vacation instead

• Vote – with this as a key issue
Help with climate science?

• OldWeather.org or Weather Detective
  • Provide historical data to fill in climate record gaps
  • Transcribe ships’ logs to learn about past climate conditions

• ClimatePrediction.net
  • Converts your computer into a climate simulator through running free software

• Data.rescue@home
  • Digitize historical weather data from around the world

www.forbes.com/sites/marshallshepherd
Resources & References

Some general useful resources
• Climate.gov
• Climate Central.org
• Natural resources defense council (NRDC.org)
• Climate Action Reserve (http://www.climateactionreserve.org/)
• Cleanet.org
• US Natl Academy of Sciences – Climate Change: Evidence and Causes primer
  http://nas-sites.org/americasclimatechoices/events/a-discussion-on-climate-change-evidence-and-causes/
• 50 things everyone can do: https://johncarlosbaez.wordpress.com/2011/05/27/the-one-best-thing-everyone-could-do-to-slow-down-climate-change/

Small business solutions:
• http://www.epa.gov/osbp/pdfs/smart_steps_greening_guide_042101.pdf
• http://smallbusiness.chron.com/businesses-should-green-766.html
• http://www.entrepreneur.com/article/224747
• http://www.aabri.com/manuscripts/131644.pdf
• https://www.sba.gov/content/federal-tax-credits-energy-efficiency

Larger organizations:
• https://hbr.org/2016/10/the-comprehensive-business-case-for-sustainability
• Ceres.org: roadmap for sustainability http://www.ceres.org/roadmap-assessment/

A little more about meat:

More on Divestment:
• https://www.theguardian.com/environment/keep-it-in-the-ground-blog/live/2015/may/26/keep-it-in-the-ground-qa-how-to-divest-your-personal-finances
• https://www.theguardian.com/money/2015/may/09/how-get-pension-fund-divest-fossil-fuels
• https://www.theguardian.com/environment/2015/may/16/how-to-divest-your-bank-account-of-fossil-fuels
Some sample facts, figures, and numbers

Each gallon of gas used = 25 pounds of heat trapping gas
   20mpg car to a 40mpg car = 4,500 gallons saved = $18,000
Replace one light bulb with compact fluorescent light bulb – 60% less energy, 300 lbs CO₂ per year
Air leaks account for 15-25% of the heat from furnaces
   Free home energy audits can reduce this, and prevent approx. $275 in wasted electricity per year
Put your fridge/freezer someplace cooler – not next to someplace warm! And defrost them regularly
Programmable thermostats
   Can reduce heating/cooling by 15% and save $200 / year (78°F summer if home, 85°F when out)
   2 degrees cooler in winter, 2 degrees warmer in summer = 2000 lbs CO₂ / year
Replace air filters in furnace/AC: 350 lbs CO₂ / year
Beef:
   1 lb beef is responsible for 18x the emission of 1 lb pasta
   If a family of four cuts meat intake in half, that’s 3 tons of emissions annually
   60% of agricultural land is for beef production, but beef is less than 2% of calories
   Leads to deforestation: 45% of deforestation is for beef
   Cows fart a lot – and methane is 23x as potent as CO₂
   And they poop a lot – and pollute water
Phantom electricity is a real problem – just leaving a laser printer plugged in and on (standby) can cost $130/yr
   A TV on standby for 21 hours, and on for 3 hours, uses almost half its energy in standby mode

http://www.ucsusa.org/global_warming/what_you_can_do/ten-personal-solutions-to.html  johncarlosbaez.wordpress: the one best thing everyone could do
Selected Significant Climate Anomalies and Events in 2016

**CANADA**
A wildfire destroyed large parts of Fort McMurray (Alberta) in early May and became the costliest natural disaster in Canada’s history.

**ARCTIC SEA ICE EXTENT**
During its growth season, the Arctic had its smallest annual maximum extent for the second year in a row. During its melt season, the Arctic reached its 2nd smallest minimum extent on record (tied with 2007).

**EUROPE**
Europe experienced its 3rd warmest year, behind only 2014 (record warm) and 2015 (2nd warmest), making the past three years the three warmest in the 107-year continental record. The average winter (Dec 2015-Feb 2016) temperature was record high.

**ASIA**
Asia observed its 3rd warmest year on record, behind 2015 (record warmest) and 2007 (2nd warmest); Apr, Aug, and Sep were each record warm, while Oct and Nov were both cooler than their long-term averages.

**TYPHOON LIONROCK**
(Aug 16th-Sep 21st)
Lionrock impacted northeastern areas of the Democratic People’s Republic of Korea (DPRK), where rainfall of up to 320 mm in four days led to catastrophic flooding and 133 fatalities.

**EAST ASIA**
A cold wave in late Jan impacted parts of East Asia. In southern China, Guangzhou recorded its first snow since 1967 and Nanjing its first since 1983. A low temperature of 3.1°C was observed at the Hong Kong Observatory, the 6th lowest temperature on record at that location.

**CONTIGUOUS UNITED STATES**
2016 was the 2nd warmest year on record for the contiguous U.S. Every state was warmer than average.

**ATLANTIC HURRICANE SEASON**
Above-average activity, 140% of normal ACE, 15 storms, 7 hurricanes.

**MIDDLE EAST**
On Jul 21st, according to preliminary reports, a temperature of 54.9°C was recorded at Mitribah, Kuwait. Upon verification, this will be the highest temperature on record for Asia. On Jul 22nd, Basra, Iraq, reached 53.9°C and Delhion, Iran reached 53.0°C, a new national record.

**HURRICANE MATTHEW**
Sep 20th.
Hurricane Matthew was the first Category 5 hurricane in the North Atlantic since Felix in 2007. The storm heavily impacted Haiti, Cuba, the Bahamas, and parts of the southeastern U.S. More than 1,000 fatalities were reported and thousands of homes and buildings were destroyed.

**INDIA**
On May 19th, Phalodi, India reached a temperature of 51.0°C, becoming the highest temperature on record for the country.

**EASTERN NORTH PACIFIC HURRICANE SEASON**
Above-average activity, 144% of normal ACE, 21 storms, 11 hurricanes.

**INDIAN OCEAN CYCLONE SEASON**
Near-average activity. 5 storms, 1 cyclone.

**SOUTH AMERICA**
Large areas of record warmth, particularly in the north, and much-warmer-than-average temperatures resulted in the 2nd warmest year, behind only 2015, since continental records began in 1910. Jan, Feb, and Apr were each record warm.

**AFRICA**
Southern Africa experienced two consecutive poor rainy seasons, with rainfall well below average in both 2014-15 and 2015-16, leading to serious drought and substantial agricultural losses.

**ANTARCTIC SEA ICE EXTENT**
During its growth season, the Antarctic had its 10th smallest annual maximum. During its melt season, the Arctic reached its 9th smallest minimum extent on record (tied with 2007).

**SOUTHWEST PACIFIC CYCLONE SEASON**
Average activity. 26 storms, 13 typhoons.

**TROPICAL STORM DARBY**
(Jul 11th-26th)
Tropical Storm Darby was the second tropical cyclone in the past three years to make landfall in Hawaii, and only the fifth landfalling cyclone there since records began in 1948.

**WESTERN PACIFIC OCEAN TYPHOON SEASON**
Average activity. 26 storms, 13 typhoons.

**SOUTH INDIAN CYCLONE SEASON**
Average activity. 11 storms, 6 cyclones.

**SOUTH INDIAN OCEAN CYCLONE SEASON**
Below-average activity. 8 storms, 3 cyclones.

**AUSTRALIAN CYCLONE SEASON**
Below-average activity. Lowest number of named storms since reliable records began in 1969. 7 storms, 3 cyclones.

**AUSTRALIA**
Australia observed its 4th warmest year in its 107-year national record. Tasmania was record warm. None of the past 10 years (excepting 2010) have been warmer than average and 7 of the 10 warmest years have occurred since 2005.

Please Note: Material provided in this map was compiled from NOAA State of the Climate Reports and international partners. For more information please visit: http://www.ncdc.noaa.gov/sotc