



Caring for the Earth

The Climate Emergency is here



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United Church of Underhill

April 26, 2020





**Grandchildren digging cover crop
January 3, 2020 (smart resilience)**

Garden soil unfrozen all winter

[Cover crop, mulch and some snow cover]

First time since Vermont settled



February 5, 2020

**Soil still unfrozen
(despite T_{\min} to -5F)**



March 1, 2020

Issues

- *Science of climate change: alanbetts.com*
 - *Lessons from the Covid-19 crisis*
- **What are our challenges?**
 - What are our responsibilities?
 - Right now to each other & society
 - To our children & to the Earth
 - *Will we sacrifice them to “Business as Usual”?*
 - *Or will we creatively transform society?*
 - *Guided by moral values rather than profit*
 - *Will we reconnect to the Earth*
- *Where will we find Peace and Joy?*

This is Dhauladhar mountain range of Himachal, visible after 30 yrs, from Jalandhar (Punjab) after pollution drops to its lowest level. This is approx. 200 km away straight. [#Lockdown21](#)
[#MotherNature](#) [#Global](#) healing.



6,760 10:21 AM - Apr 3, 2020 · New Delhi, India

Rollback of environmental laws

- **Hiding behind Covid-19 crisis, Trump is prioritizing polluters over public health & climate change!**
- **Stop monitoring & reporting air and water pollution – as global economy crumbles!**
- **Rolling back automobile emissions and fuel efficiency standards – burn more oil!**
- **Lawsuits are starting....**

Different Mindsets-1

- ***Technology will save us***
 - ***We are in charge: no need to change behavior***
 - ***Economics based on individual consumerism produces 'wealth'***
 - ***Oil has made us rich***
 - ***Inventions will power the future***
- **Climate, life & humanity interwoven**
 - Environmental intelligence crucial
 - Community imagination & creativity essential
 - Intergenerational time-frame
 - Sustainability & Justice interwoven

Environmental Intelligence

- “Blend of natural science, social science and indigenous knowledge that helps humans interact constructively and creatively with the living natural world”
 - Missing as we exploit the environment to support corporate profits; dumping the costs on the poor, the indigenous, our children and all life
- Huge conscious challenge for society
 - Key to smart community resilience
 - Spiritual roots are key

Different Mindsets-2

- **Western capitalist mindset**
 - Anthropocentric, egocentric & dualistic
 - Exploit & subdue natural world & people
 - Growth based on cheap fossil fuel
(\$3/barrel, 1945-1973, when OPEC rebelled)
 - *[Driving climate change & ecosystem loss]*
- **Indigenous mindset**
 - Ecocentric: respecting life and nature
 - Shared resources, holistic
 - Long-term view
 - *[Not part of our education]*

Economic doctrine vs Reality

- “Free market” promotes material growth
 - = Freedom to exploit Earth’s resources & poor
 - “Regulation” interferes with growth/profits
 - The assets and interests of the wealthy must be protected, since they fund politicians
 - Choices must be “cost-effective” now: future costs can be *discounted* or paid for later
- Economics driving Climate Change
- since Earth does not discount the future accumulates energy imbalance in oceans
 - Catastrophe ahead for our children and all life
 - Embracing indigenous worldview essential

Financial Interests Amoral

- **Fossil fuels reserves are worth \$20-30T**
 - Big money: “of course we will burn them”
- **Banking: JP Morgan Chase is leading US bank investing in new fossil fuel development**
 - CEO chairs business roundtable and talks soothingly about improving capitalism to create a healthier society with affordable health care and better climate policies (*Time*:2/3/20)
- **World's largest asset manager is BlackRock; also the world's largest investor in fossil fuel companies and utilities**
 - Web-site talks about “integrating environmental, social and governance practices into our investment processes to creating positive social impact”
- **Insurance industry routinely invests enormous sums in the fossil-fuel industry**

Capitalism and Covid-19

- **Capitalism exploits people and resources to maximize profit and minimize costs**
 - **Has no consideration for resilience and long-term stability.**
 - **Or justice for working people, or for life on Earth**
- **Covid-19 exposed**
 - **the servitude of the poor with limited assets and health care**
 - **The collapse of the vulnerable global economy**
 - **The exploitation in the health-care system**

Community Resilience

- ***Shared* local infrastructure, resources, knowledge and awareness**
 - Designed to maximize efficiency and renewable energy use; and consume less
 - Localized shared food supply
 - Shared efficient transport system
 - Support ecosystems long-term
 - *Needs imaginative community*
 - ***Contrast to ‘happy isolated individuals addicted to consumerism, escapism and the media’***
(Joanna Macy)

Distinguish Human-made World and the Natural World

- We understand the human-made world, the world of computers & technology – because we made it - predictable, controllable
- The same is not true of the natural world – which is far more complex and alive. We struggle to understand it. Prediction & control are uncertain
- *E. F. Schumacher called it the ‘created’ world*

- **Strengths of science:**
 - integrity, honesty and communication
 - *particularly valuable in a society lost in ignorance and deceit*
- **Limits of science:**
 - tangible, measurable and communicable
 - *hard to deal with the complexity and interconnections of the living natural world*

The Coming Catastrophe

- **What are the challenges ahead?**
 - Complex living systems: nearing collapse
 - Fossil capitalism incompatible with livable Earth
 - Financial, political & social resistance to change
 - Corruption in the system at many levels
- **Moral issues surfacing at last**
 - Sacrificing our children and the poor
 - Extinction of species & stable biosphere
- ***Global Rebellion has started***

Greta Thunberg (born Jan 2, 2003)

[Fridaysforfuture.org](https://fridaysforfuture.org)



Swedish parliament: Fall, 2018

Crossing Atlantic in August, 2019



September 20-27, 2019

- 7.6 million, 185 countries: School strikes demanding climate action (*Ongoing*)



Extinction Rebellion

- Destruction of Earth now a Civil Rights issue
 - Can only be checked by civil disobedience
 - To defend the rights of our children
 - To defend the rights of the Earth
- Shut down London 4/15 to 4/17 till UK and Scottish governments declared “Climate Emergency”
- October 7-14: actions in 60 cities around the world
 - *Motto: Compassion; awareness; courage*
 - *Visionary and creative* [***https://rebellion.earth***](https://rebellion.earth)
 - Force large reductions in C-emissions this decade
 - *XR-Newsletter 34_ Hell and High Water (weekly)*

Frederick Douglass, 1857

“Power concedes nothing without a demand. It never did and it never will. Find out just what any people will quietly submit to and you have found out the exact measure of injustice and wrong which will be imposed upon them, and these will continue till they are resisted ...”

[Jamaican Black Baptist minister (Samuel Sharpe) 12/25/1831 Rebellion, led to Slavery Abolition Act (1833) for entire British Empire]

Recap Perspective

- Much of western philosophy and theology formed when humanity had a limited understanding of its place in the natural world; but the structures of belief didn't matter too much
because our impact was small.
- All this started to change with the industrial revolution powered by fossil fuels. Now humanity has a *global impact on the natural world*, and understanding our place in it is paramount.
- *Science and technology created this situation*, and must help us find a way out, by helping us understand the earth as a global system
- *But we need moral guidance*

Moral framework?

- Separation of church, state and science enabled rise of science/technology in an *amoral* framework
 - Driven by creative exploration
 - Framed by sense of human superiority and power
 - Supported by money and capitalism
- Christianity's Roman Catholic framework was created at the Council of Nicea in 325 AD
 - when Emperor Constantine of Rome proposed a deal
 - Define Christianity with a clear enforceable set of doctrines
 - Select the Greek gospels with their dualistic framework and a clear sense of human power over the natural world
 - Suppress the holistic indigenous Aramaic gospels
- Catastrophe: a million (?) Jewish and Assyrian Christians, who understood *Yeshua's Aramaic teachings*, perished as heretics within a century or two
 - Roman Catholic church lost its holistic indigenous roots
 - *That Christians must now recover!*

Read *Laudate Si*

- **Pope Francis understands the core issues**
 - The need for spiritual guidance to direct technology
 - That the exploitation of the Earth and the poor is immoral
 - That human relations with nature and the past teaching of the Christian churches on this need to be rewritten
- **Despite this, much of the Catholic Church has been resistant to deep change**
- **Returning to the indigenous mindset of the Aramaic teacher, Yeshua, is transformative**
 - *Provides the guidance, creativity and joy needed*
- *How can you approach this?*

“Thy will be done on earth”

requires that people of faith have a
deep understanding of Earth, Spirit &
the whole Creation, so we can be
responsible stewards

Take Creation to your spiritual practice!
Take your personal savior to Creation!

Yeshua's world was the indigenous world

I think of his core teaching as

“Come with me into my world, the world of the Creator, where you will see the truth of the living web of the Creation; and that truth will set you free to act on behalf of the Creator”

***Take Creation to your spiritual practice!
Take your personal savior to Creation!***

Discussion after service *(and practical issues)*

- <https://alanbetts.com>

Gracious Father, fill us with thy spirit and understanding, and connect us with the web of life, your creation.

Help us reach out to one another in love and gratitude, generosity and courage.

Together we can reimagine our society & create a path forward for the Earth.

Let us remember those that will come after us; our children and grandchildren and their grandchildren.

Let us remember those who live in poverty, and reach out to them with a grateful heart.

Give us the clarity, courage and humility to drive change, so that *“Thy Will be done on Earth”*.

In Thy name we pray, Amen

What can I do?

- **What can I do?**
 - In my home and family
 - In my surroundings and community
 - What is immediate and what needs planning?
- **How can I help my neighbors?**
 - and how can they help me?
- **What attitudes are holding me back?**
 - How can I soften?

Efficient transport

- Gasoline to hybrid: 50% gain to 50mpg
- Hybrid to plug-in hybrid: now 135mpg
- Electricity from community solar array



>3000lbs and 135 mpg
Payload: 750 lbs at 60 mph



180lbs: solar panel on roof
Payload: 350lbs at 20 mph

**Share
transportation!**

73lb Cargo bike;
300 lbs at 20 mph



Hurricane seasons

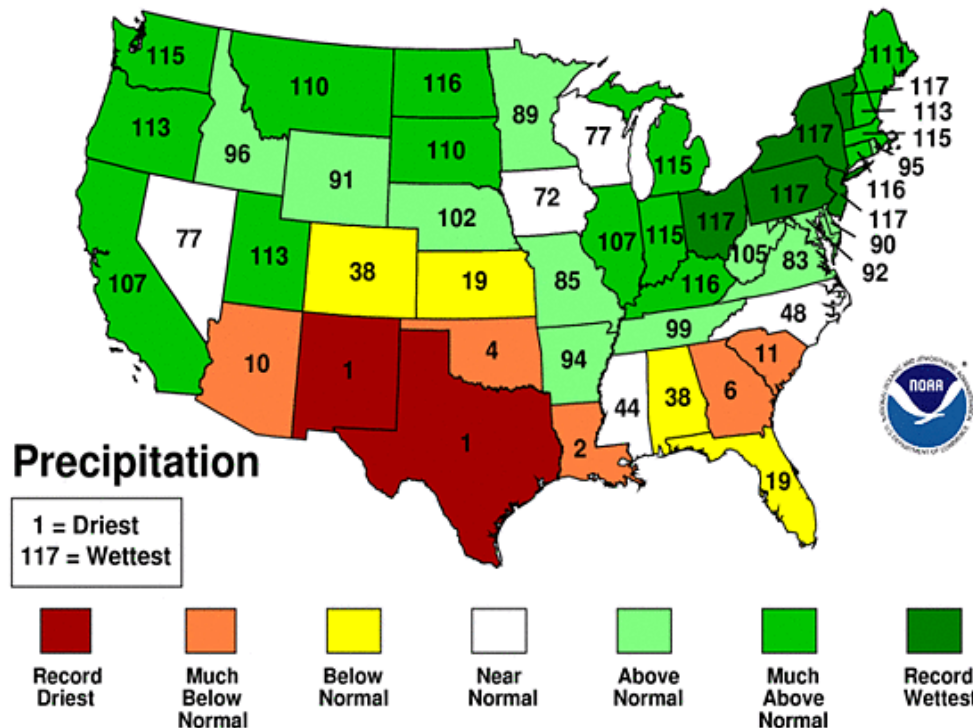
- Earth is warming as greenhouse gases increase and reflective ice cover falls
- *Oceans are storing 93% of heat*
 - Warmer Atlantic, Caribbean, Gulf of Mexico and Gulf Stream means stronger hurricanes; when vertical shear is low
- *2017: Harvey, Irma, Maria*
- *2018: Florence, Michael*
- *2019: Barry, Dorian*

2011 Floods: VT and NY

- Record spring flood: Lake Champlain
- Record flood with Tropical Storm Irene

March-August 2011 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



March-August, 2011

- Record wet : OH to VT
- Record drought: TX & NM
- Pattern nearly stationary

Value of Flood Plains



- **Otter Creek after Irene on August 30, 2011**
 - **River rose ten feet: flood plain saved Middlebury**

Irene: Resilience

- **13 towns cut off overnight**
 - Including Rochester & Stockbridge
- **State emergency systems flooded**
- **FEMA: no road access**
- **Communities reorganized overnight**
- **Those with equipment stepped in**
 - “Can fix this in 72 hrs”: will need engineer to check bridge (Brandon)
 - “We worked 120hrs last week...” (Wardsboro)
 - Social networks collected supplies; and rescue services across mountains
 - *Communication networks critical*

Flooding increasing

- Warmer temps = higher rain-rate (4%/°F)
- As Arctic warms 2X faster than equator
 - N-S temperature gradient decreasing
 - Westerly jet-stream slowing & meandering
 - Patterns stationary for longer
- **Slower moving storms mean more rain over one place - more flooding**
- Harvey stayed 4 days over Houston, raining 10 in/day [*Florence 3 days; NC*]

Management of water

- Engineering approach was to get it off the land into streams & rivers (“manage it”)
 - Must now oversize all culverts/ bridges
- As extremes of flood and drought increase
 - Need to store water in ground for summer use
- Summer water extraction by roots from ground storage damps 60% of precipitation anomalies: maintains evaporation in dry years

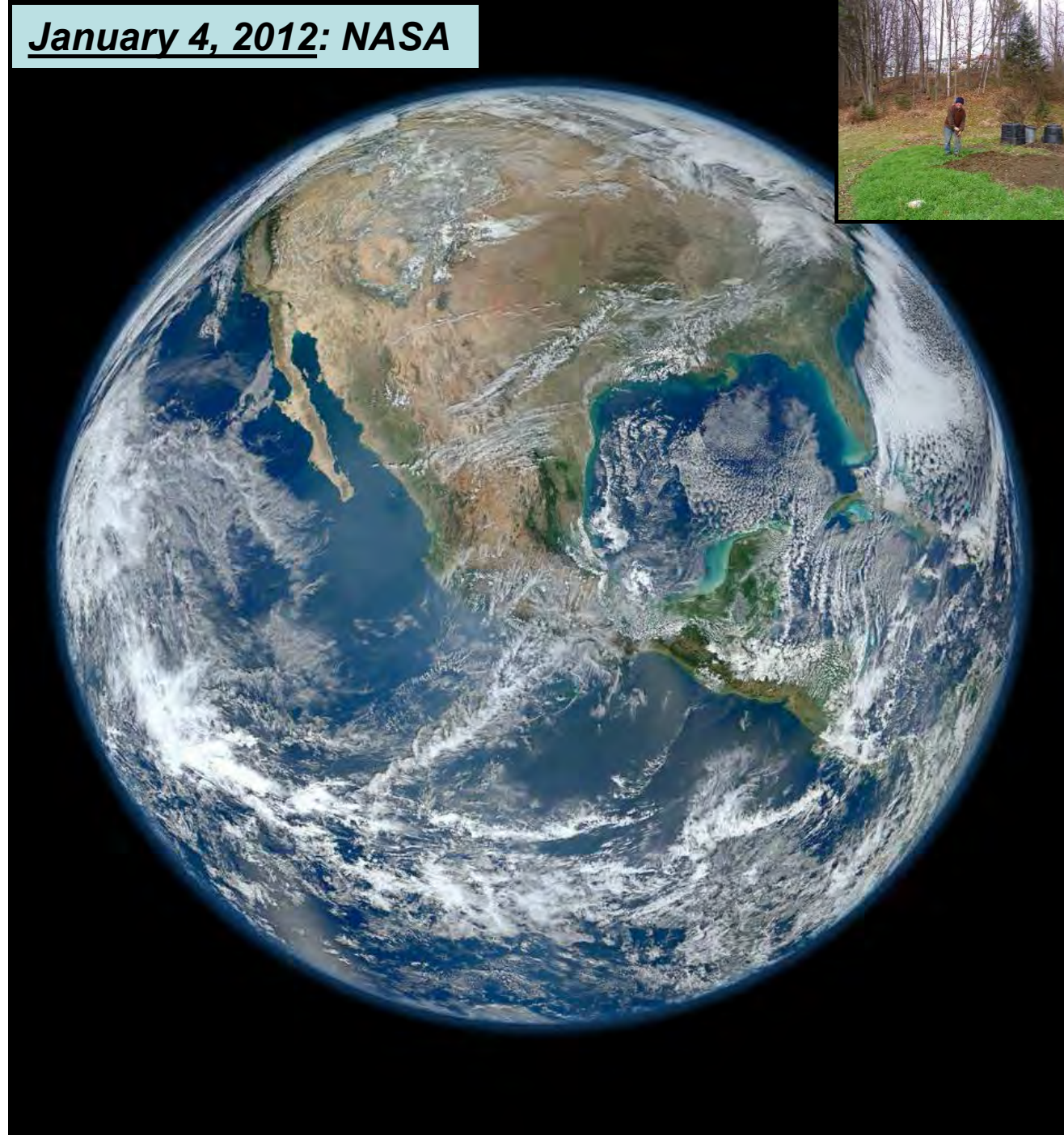
Gardening in Vermont for 40 years

- How long was growing season in 1970s?
 - About 125 days: now 155 days
- How long was the ground frozen?
 - About 155 days: now 125 or much less
 - No longer hard freeze in November
- Winter climate zones in 1970's were
 - Zones 4-5: now zones 5-6 (10F warmer)
- BUT winter variability increasing

Earth's climate sustains life

- **Greenhouse gases keep Earth warm**
 - Increase of CO₂ warms further
 - Evaporation of more water vapor triples warming
- **Ice & snow melt; less reflection of sun**
 - Arctic warms
 - Winters warm
- **Oceans store heat & get warmer**
- ***Extreme weather is increasing as Arctic warms; westerlies slow down***

January 4, 2012: NASA



My Wake-up Call: Gardening in January, Pittsford, VT



January 7, 2007

December 2006:

- Warmest on record



January 10, 2008

Warm Fall:

- Record Arctic sea-ice melt
- Snow cover in December,
ground unfrozen



January 2, 2012



March 11, 2012



October 2011– March 2012

- **Warmest 6 months on record**
- **My garden frozen only 67 days**
- **January 15, 2013**



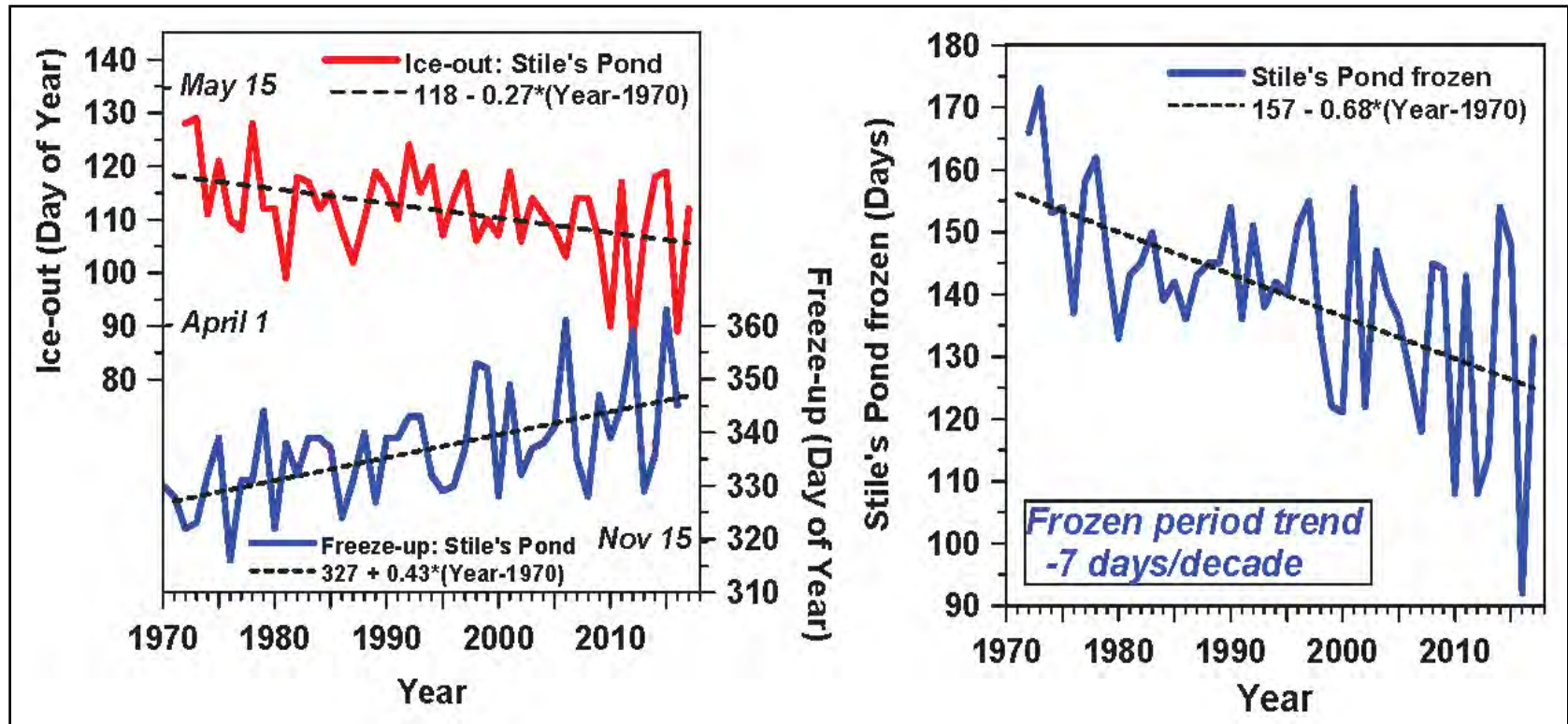
February 5, 2016

(Digging in Feb. first time ever)



Marker: Lake Freeze-up & Ice-out

Frozen Period Shrinking: variability huge



- Freeze-up later by +4 days / decade
- Ice-out earlier by -3 days / decade
- Lake frozen period trend - 7 days/decade
- Interannual variability \approx 40 yr trend

Stiles Pond:
"Eye on the Sky"

March 3, 2017

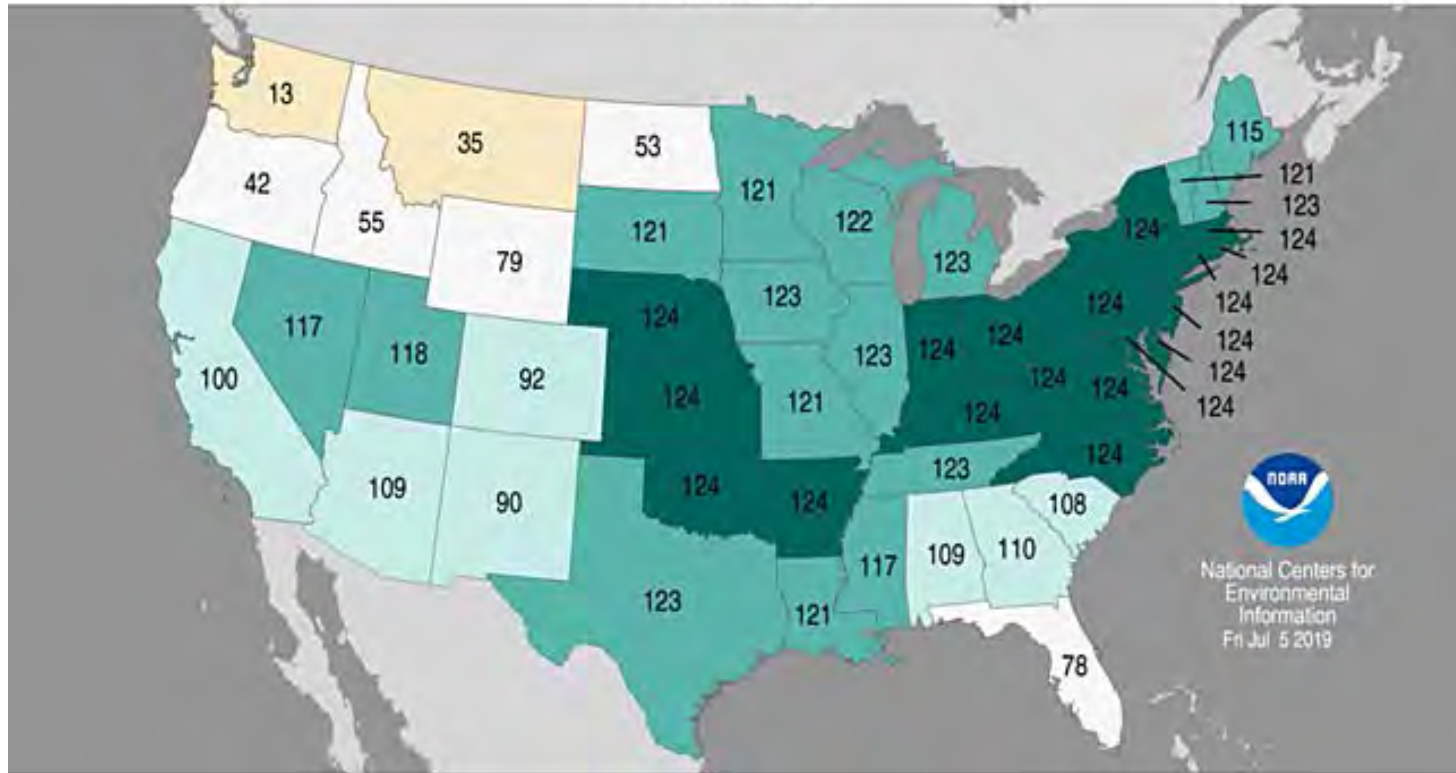


July 2018 to June 2019

Statewide Precipitation Ranks

July 2018–June 2019

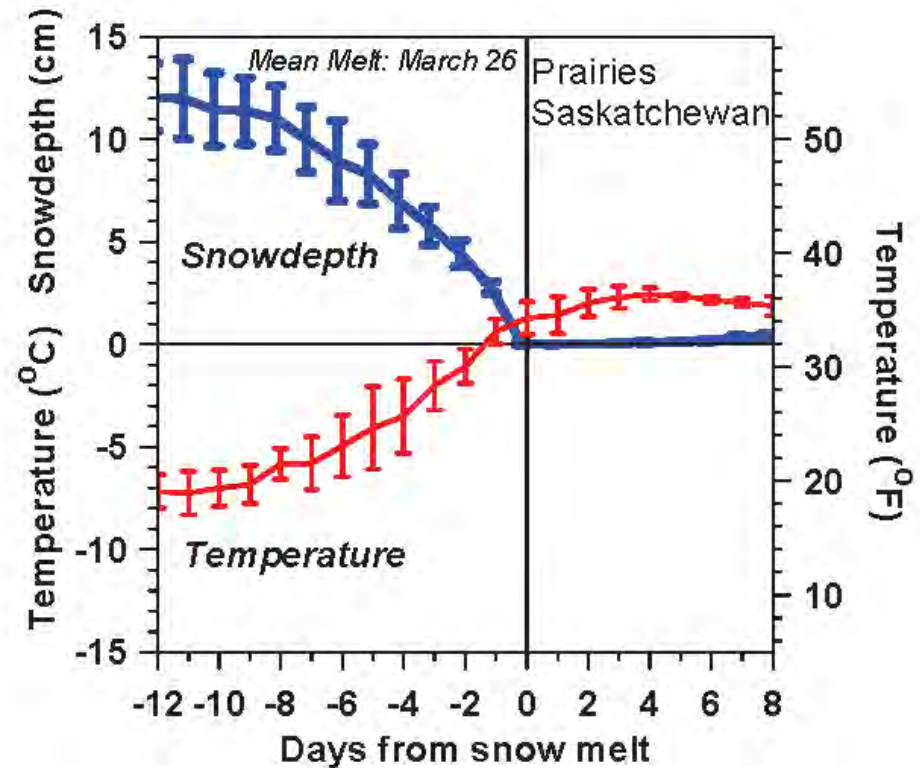
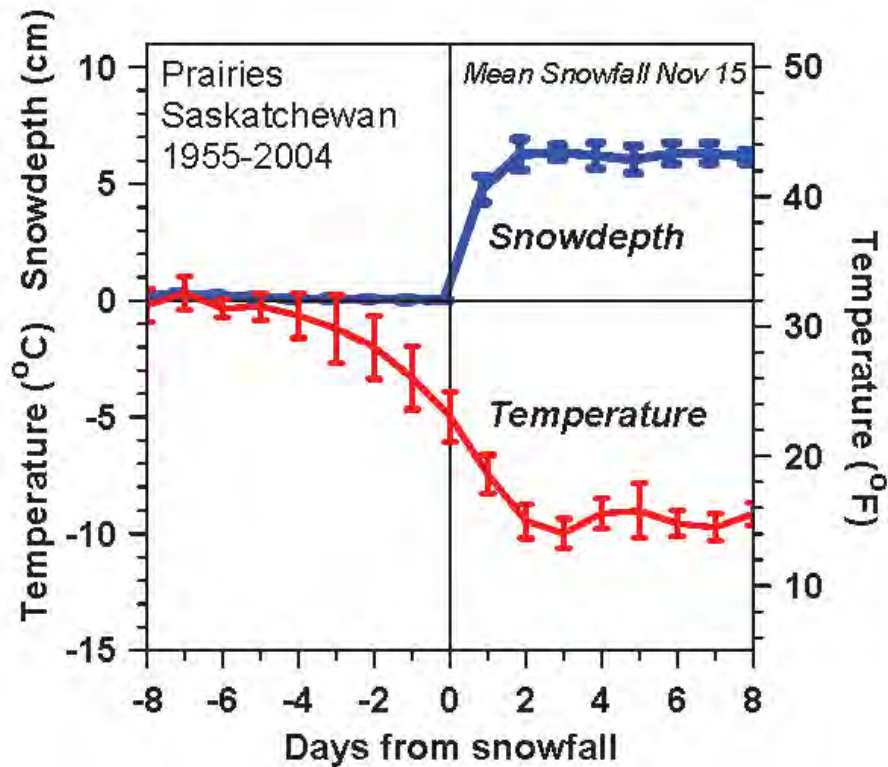
Period: 1895–2019



Record Precipitation Eastern & Central US

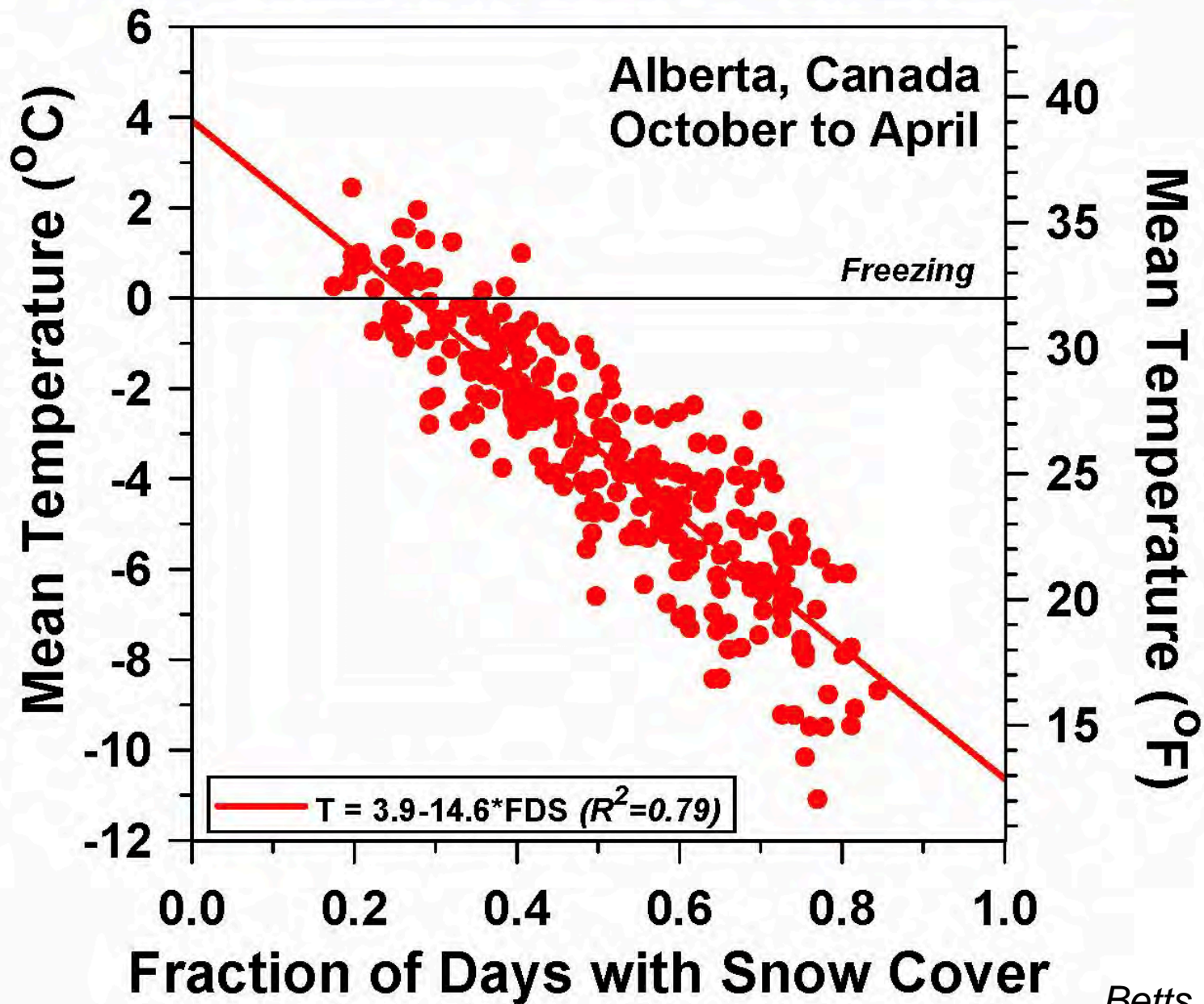
2019 Mississippi flooding longest on record

Snowfall and Snowmelt



- Temperature changes 10°C with snow cover
- Snow cover is a 'climate switch'
- *Fast transitions in 'local climate'*
 - *Snow reflects sunlight*
 - *Reduces evaporation and water vapor greenhouse*

More snow cover - Colder temperatures



Impact of Snow

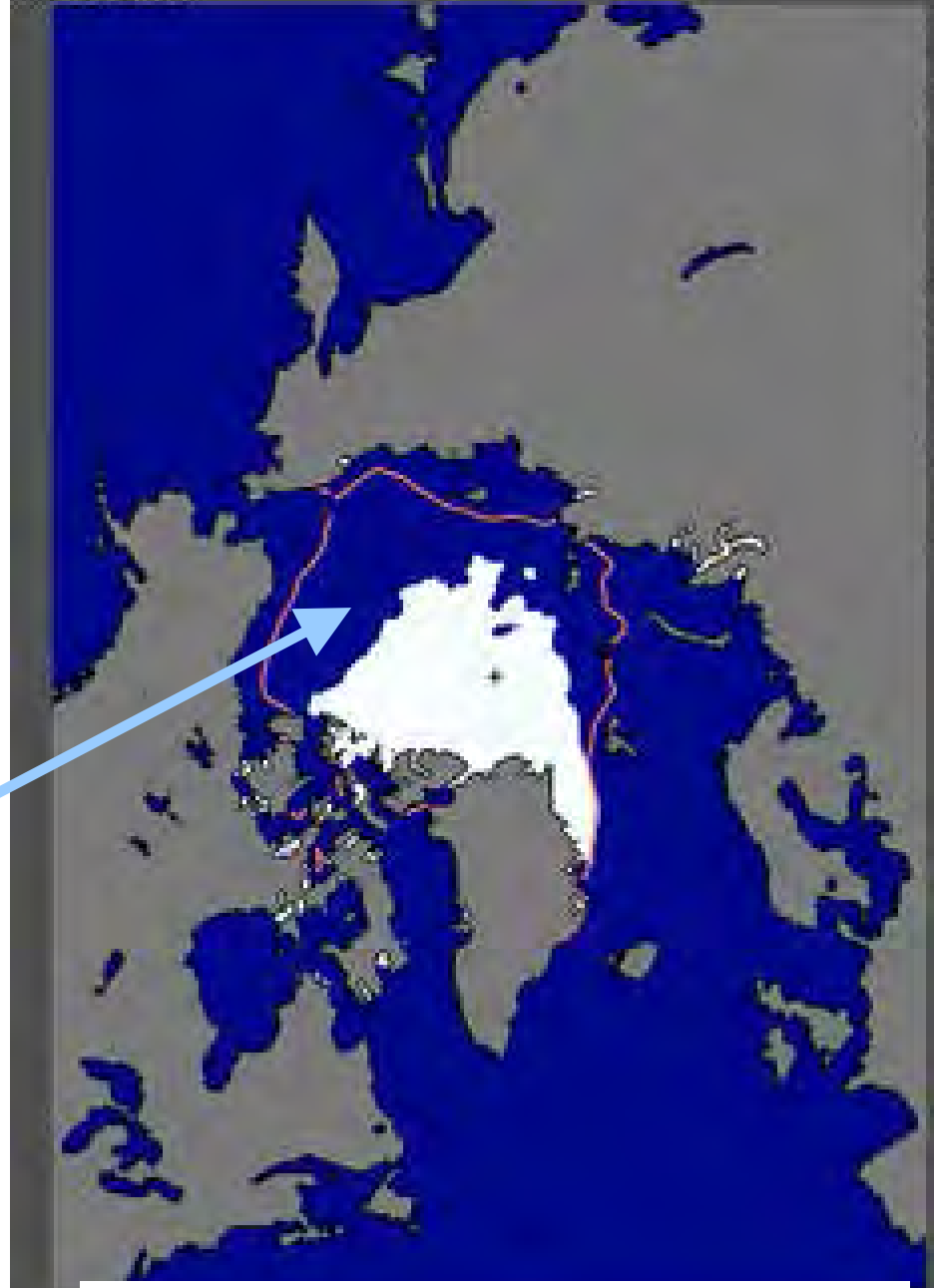
- **Distinct warm and cold season states**
- **Snow cover is the “climate switch”**

With snow

- **Prairies: Temperature falls 10°C (18°F)**
 - **snow reflects 70%**
- **Vermont: Temperature falls 6°C (10°F)**
 - **snow reflects 35% (because more forest)**

- Half the Arctic Sea Ice Melted in 2012
- Open water in Oct. Nov. gives warmer Fall in Northeast

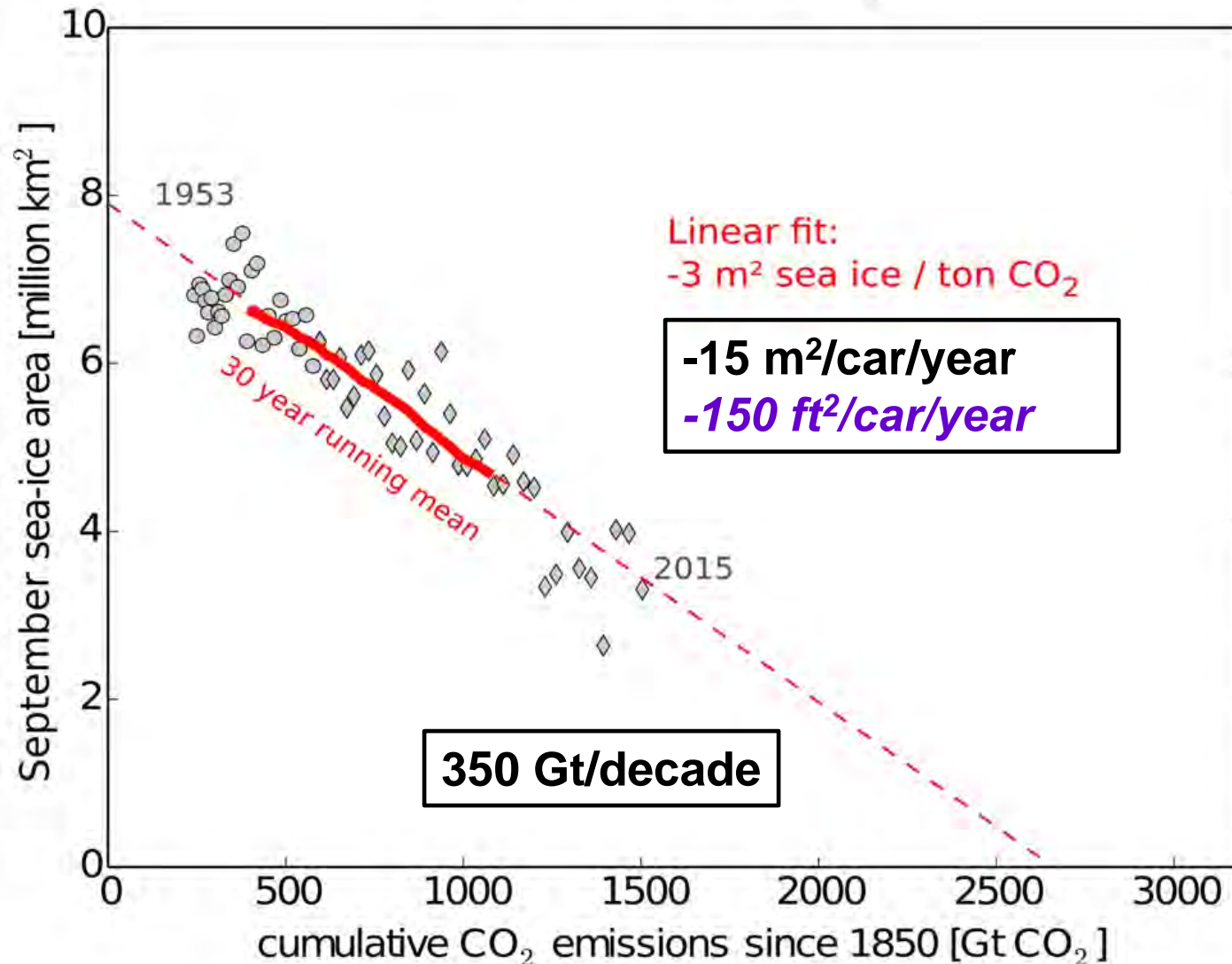
- Positive feedbacks:
- *Less ice, less reflection of sunlight*
- *More evaporation, larger vapor greenhouse effect*
- Same feedbacks as in our winters



World promised to stop “Dangerous Climate Change”? (UNFCCC 1992)

- **How?** Quickly stabilize atmospheric CO₂
- This means an 80% drop in CO₂ emissions!
- **Possible but difficult for industrial societies**
 - Fossil fuels have driven our industrial growth and population growth for 200 years
 - “Lifestyle” has become dependent on fossil fuels
 - **Powerful vested interests**: trillions \$ at stake
 - No ‘smart’ moral guidance

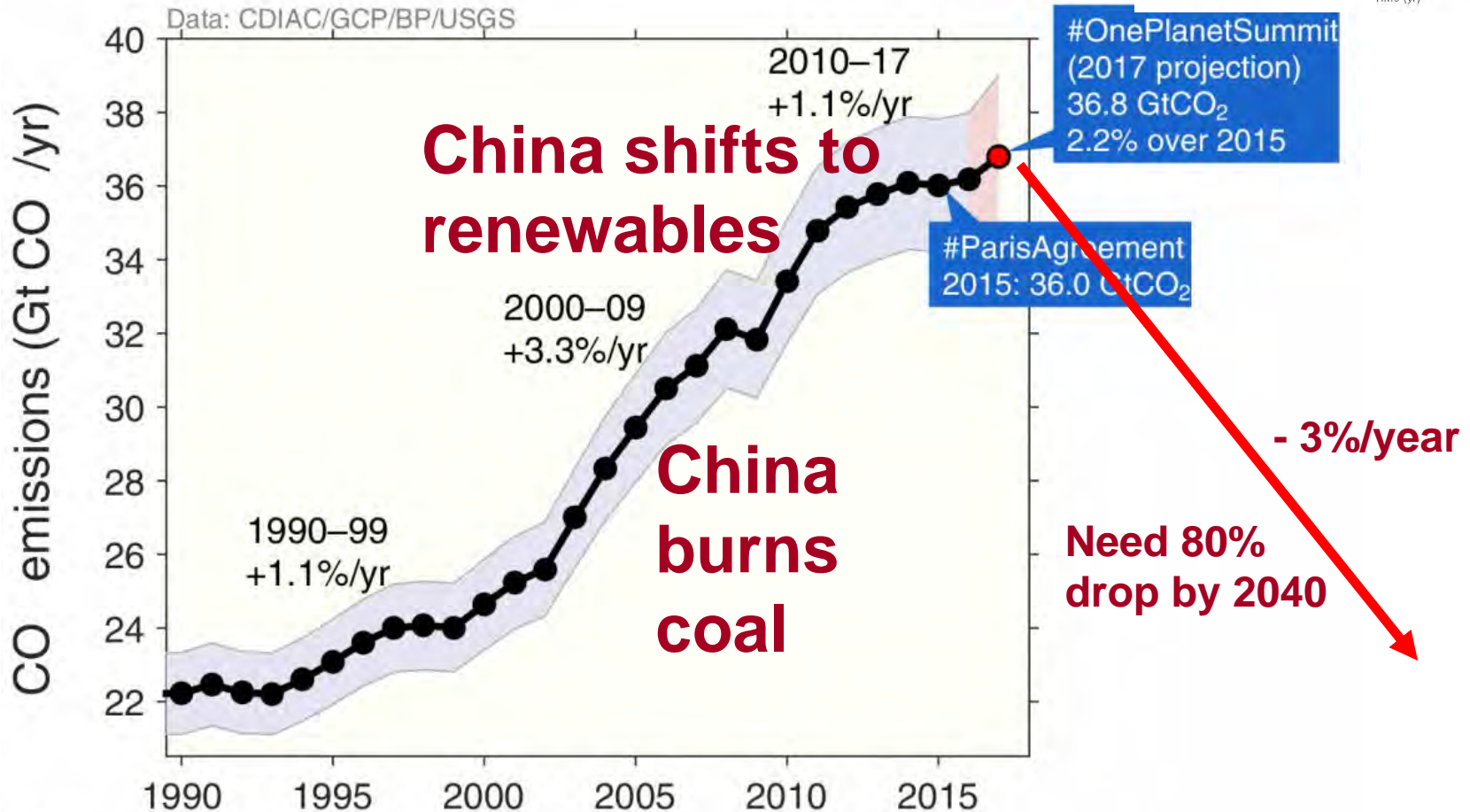
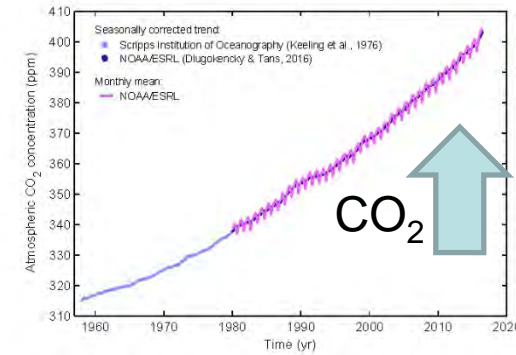
September Arctic Sea Ice Loss



2015 was Transition Year (?)

- **Climate meeting in Paris in December**
 - 188 Nations made ‘national commitments’
- **Pope Francis encyclical on the environment, climate change and our responsibilities to the Earth**
 - Exploitation of the Earth and the poor are inseparable
 - Short-term profit as primary motive is immoral
 - Told Catholic Church to act: *institutional resistance*
- **2017/20: US cancels the commitments it made**
 - 2019 UN report says one million species will be gone in the next decade or two from habitat loss and climate change

Growth of CO₂ Emissions slowed – now increasing



What do we need?

- **Future needs creative approaches**
 - Efficient society run on renewable energy...
 - *But it needs vision and deep change*
- **We need to work with the Earth's biosphere**
 - *People reconnected to landscape; to Earth*
 - Manage water on landscape
 - Manage forest diversity for a warmer climate
 - Manage diversified year-round agriculture
 - Manage energy crops and solar farms

Climate Emergency is here

- ***Last decade to avoid the worst***
 - Citizens/communities must demand action
 - Governments paralyzed by corporate \$
 - US particularly helpless
- ***Glimpse of action: 12/29/2019***
 - ***Netherlands Supreme Court ordered the government to meet 2015 climate commitments for 2020 and 2025***
 - ***Legal actions in many other countries***

What matters in Vermont?

- **Of course we cannot fix global challenge alone**
 - Don't wait for Montpelier: partial solutions by 2050 (*'while growing economy'*), veto threats....
 - Redoing capitalism critical but a huge challenge
 - Redoing financial system critical, also huge
 - Drive change in energy and transport systems
- **Relocalize as much as we can**
 - Localize food supply: year round
 - Vermont should have enough water if we plan
 - Big changes across US; southern and western drought, fires & floods - will impact migration

Strategies for Resilience

- Understand technical/ecological issues
 - And place great value on future
- Engineer for efficiency and resilience
 - Reject: “cost effective for today’s bottom line”
- Spend \$1 trillion on climate resilience
 - saves \$60 trillion later this century
- If we ignore climate change
 - Catastrophic costs for humanity and Earth’s ecosystems
 - Community resilience & resistance!
 - Needs imagination and creativity - which inspire!

Can Science & Policy be kept separate?

- *Separation was the traditional frame*
 - How scientists are trained
 - It protects the integrity of science
 - Invaluable for global cooperation
- *But we cannot solve global challenges with this dualist mindset*
 - *Dates back to Greek and Roman period*
 - *Drove the rise of science, but also driving destruction of the Earth*

Indigenous Reconnection

- *Resolve to save the Earth*
alanbetts.com/writings (1/18/2020)
 - Reconnect to Earth awareness
- *This was the holistic teaching of indigenous Aramaic teacher Yeshua*
 - that Christianity suppressed to become the state religion of Imperial Rome

What are Your Responsibilities?

- **Just do what society expects?**
 - Be docile servants; leave policy to ‘others’
 - Avoid public engagement and politics?
- **Or recognize**
 - Climate change is existential issue for humanity, the future of the Earth and its ecosystems
 - Understanding brings responsibility
 - *Your skills essential to create livable future*
 - *Deeper understanding & communication needed*

