자유주의연구회 초청강의

기후 위기론과 탄소 중립의 불편한 사실

『불편한 사실』은 '민주주의의 생존', '진정한 과학의 부활', '객관적 진리의 승리'를 위해 꼭 필요한 책이다. 훌륭한 자료조사, 명쾌한 문장, 멋진 시각적 표현, 그리고 무엇보다 모든 내용을 사실에 기초하고 있다.

크리스토퍼 몽크톤(영국 언론인)

2021. 6. 3.

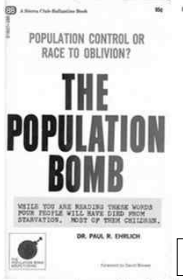
이화여대 환경공학과 교수 박석순
(전)국립환경과학원 원장

강의 개요

1. 환경 비관론과 낙관론
2. 지구온난화의 등장
3. 기후 위기론의 과학적 허상
4. 이산화탄소와 화석연료 재평가
5. 기후 재난 거짓말
6. 정치사회적 현황과 전망

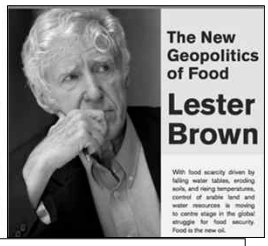
1. 환경 비관론과 낙관론

환경 비관론(Eco-Pessimism)

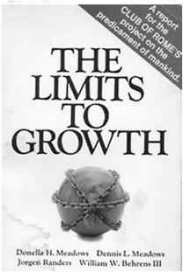


Paul Ehrlich's *Population Bomb* (1968)

- Neo-Malthusians: population growth will increase faster than food production
- Population growth causes famine and conflict
  - Civilization would end by the end of the 20th century



1980년대가 되면 전 세계 40억 명(미국 6,500만 명)이 굶어 죽게 된다.

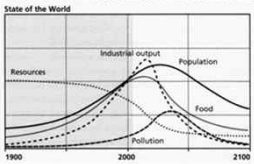


1992년 석유 고갈

2010~2030: 오염, 자원부족, 식량 부족 ➔ 산업 생산이 감소

Jorgen Randers, Jay Forrester, Donella Meadows, Dennis Meadows, and William W. Behrens III in 1972

Limits to Growth? 1972 Study



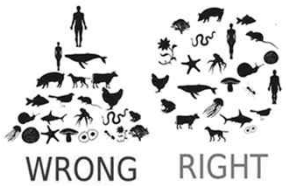
- BAU Computer Model for "World 3"
- Pollution and resource scarcity starts to impact ind.productn and then food in decades 2010-2030

산업문명은 인류에게 음울한 미래를 가져올 것이다.

1970년 지구의 날

생태근본주의(Deep Ecology)

"인구가 줄어야 지구가 산다"
1973년 아른 네스,
노르웨이 오슬로대 교수

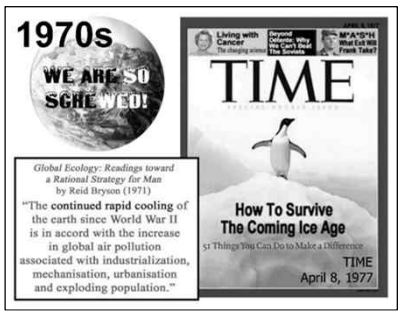


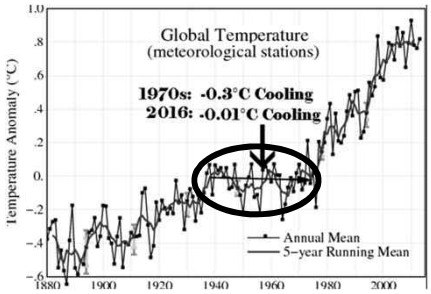
사회생태주의(Social Ecology)


Murray Bookchin

머레이 북친, 미국 라마포대 교수
- **사회주의 계획경제가 환경 우위다**
- **자유민주주의 시장경제는 파괴되어야 한다**
- **자본주의는 지구 생태계의 암적인 존재다**

지구냉각화 소동(1970년대)



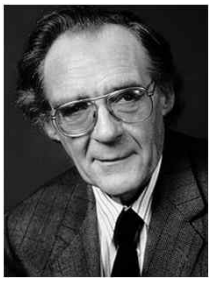


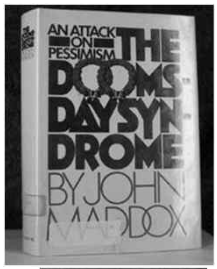
환경 낙관론(Eco-Optimism)

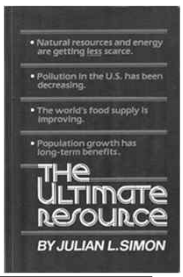
"과학과 기술의 발달과 법과 제도 개선으로 해결 가능"

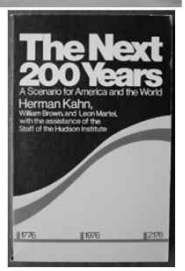
존 매독스<종말의 날 증후군, 1972>
허만 칸 <다음 200년, 1976>

줄리언 사이먼<궁극적 자원, 1981>





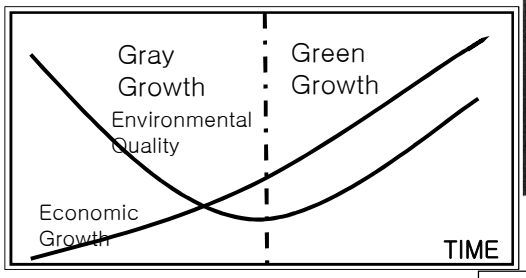


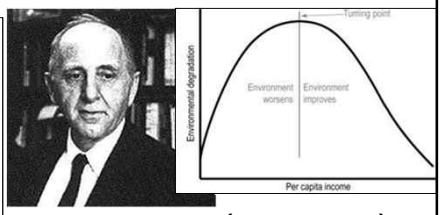


환경과학과 기술, 법과 제도 발달

2. 지구온난화의 등장

환경 낙관론의 승리



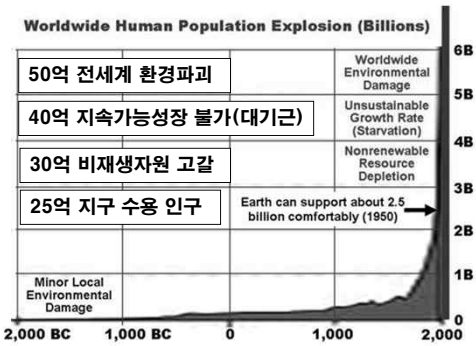


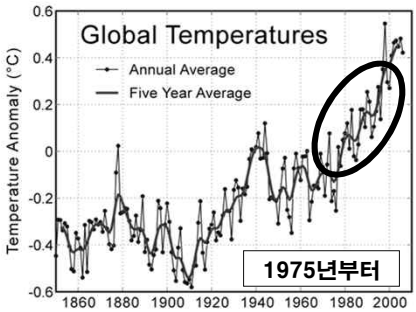
Simon Kusnetz(1901～1985)
1971년 노벨경제학상

U-Turn 이론이 현실로 나타남

자유민주주의 시장경제의 승리

환경 비관론자들의 새로운 대상

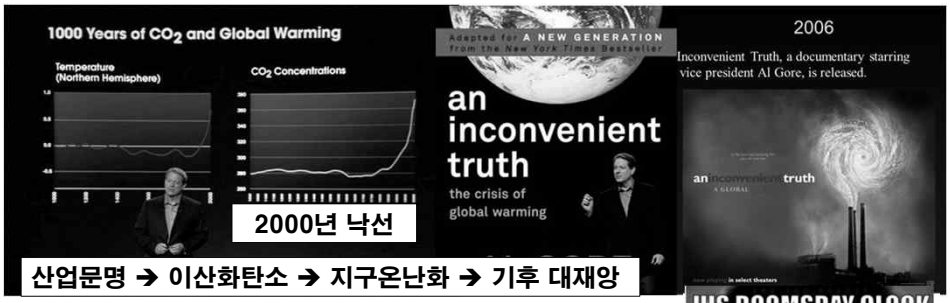




NASA scientist
James E. Hansen
testifying in June 1988.

기온 측정
온도계 1659년부터(영국)
기상 기구 1950년대 중반
1979년부터 위성 측정

앨 고어의 불편한 진실(2006)



2000년 낙선

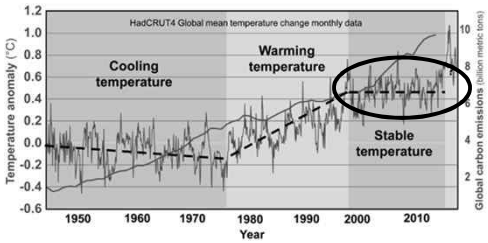
산업문명 ➔ 이산화탄소 ➔ 지구온난화 ➔ 기후 대재앙

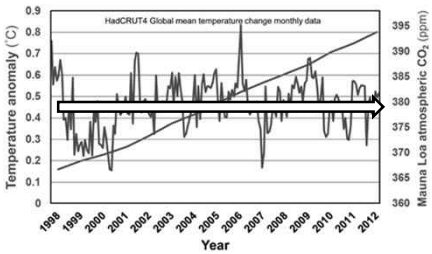
우리가 지구를 구할 수 있는 시간은 10년밖에 남지 않았습니다. 지금부터 세어봅시다. 2006년 1월 27일

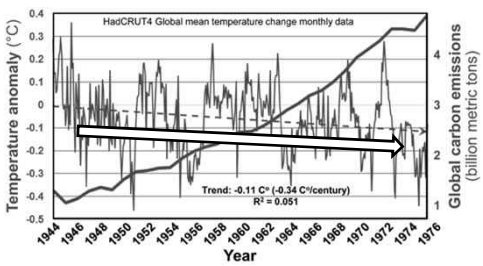
2007년 노벨평화상

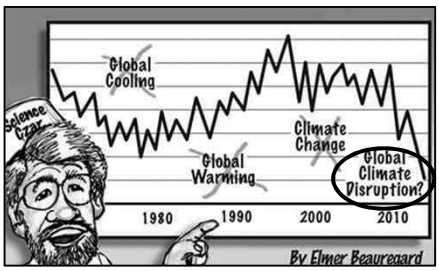
2007년 아카데미 최우수 다큐멘트리상

지구온난화의 중단(1998년부터)





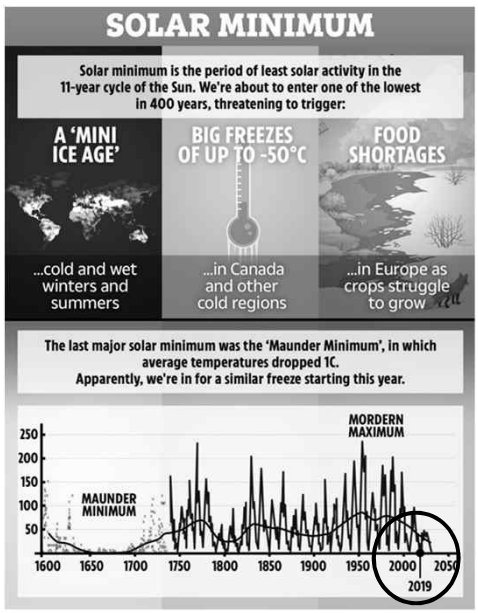


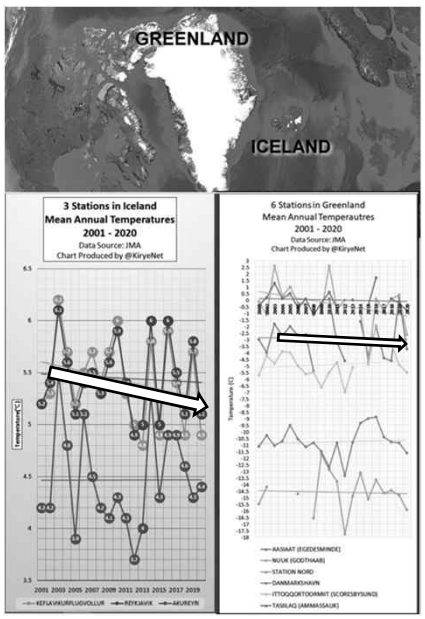


지구온난화에서 기후변화로(2005년경)

기후혼란?

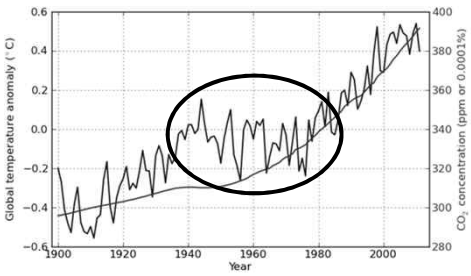
소빙하기의 시작(2014년)



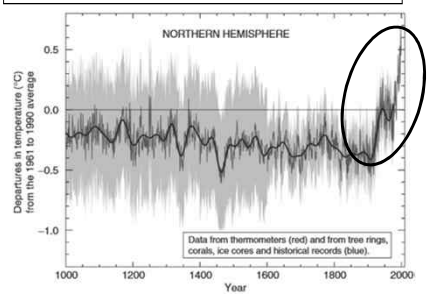


3. 기후 위기론의 과학적 허상

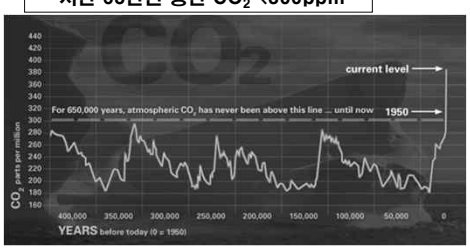
(1)이산화탄소가 기온 상승 유발



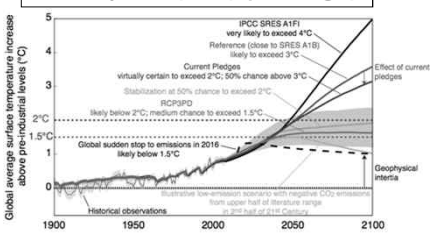
(2)하키 스틱: 지금까지 유래 없는 기온 상승



(3)이산화탄소 ➔ 기온 상승
지난 65만년 동안 CO_2 <300ppm

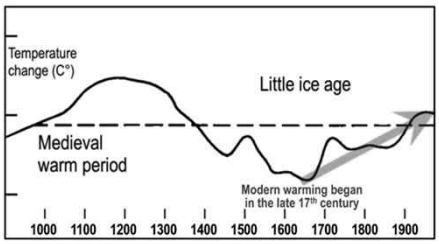


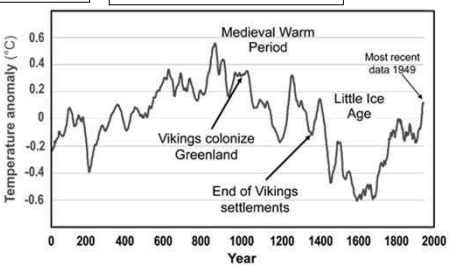
(4)컴퓨터 모델 예측: 최대 6.4°C 증가

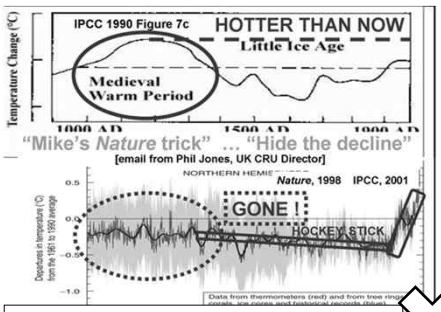


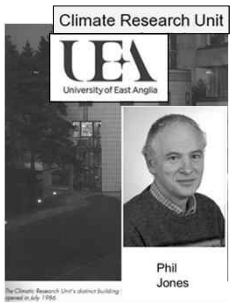
조작된 하키 스틱의 기후 게이트(2009년)

Climate Gate 1









(2)하키 스틱: 지금까지 유래 없는 기온 상승

2009년 이메일 해킹으로 밝혀짐

두 번째 기후 게이트

2017년 내부 고발 사건(Climate Gate 2.0)


The Mail ON SUNDAY

The Mail on Sunday today reveals astonishing evidence that the organisation that is the world's leading source of climate data rushed to publish a landmark paper that exaggerated global warming and was timed to influence the historic Paris Agreement on climate change.

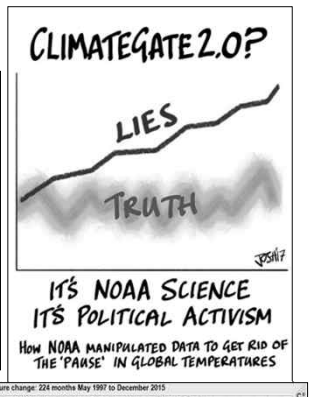
A high-level whistleblower has told this

own rules on scientific integrity when it

2015년 파리협약 직전 보고서

Dr. John Bates, a top NOAA scientist with an impeccable reputation, has shown irrefutable evidence that the Pausebuster paper was based on misleading, erified data.

2017년 2월 4일 The whistleblower

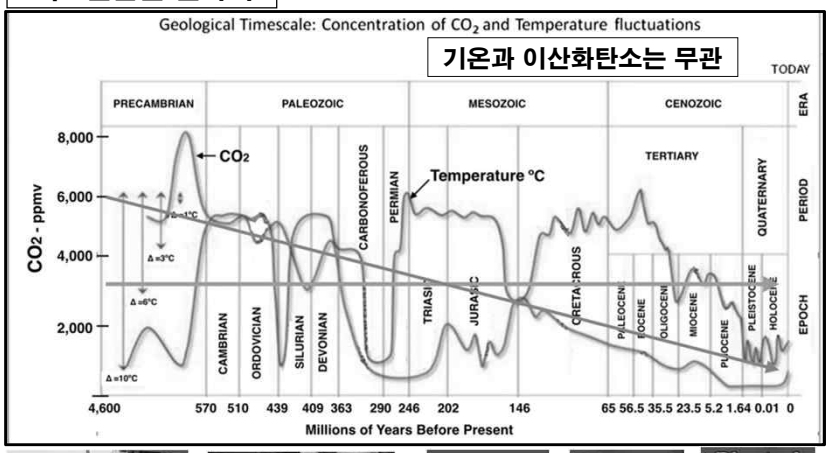


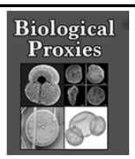

Thomas Karl, Director NCEI/NCDC

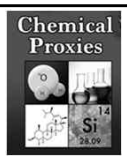
(1)이산화탄소가 기온 상승 유발

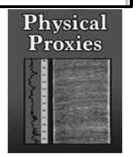
고기후학에서 관측된 자료

5억 7천만년 전까지

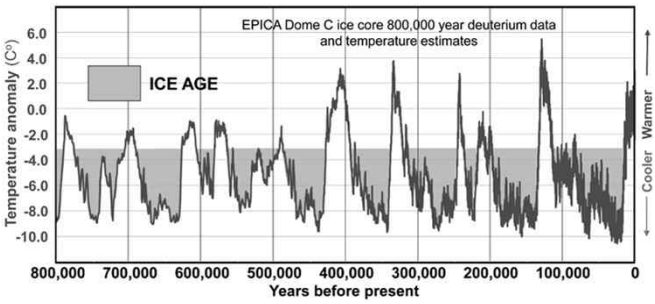


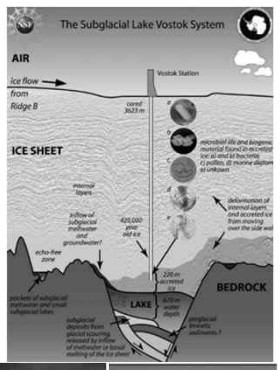


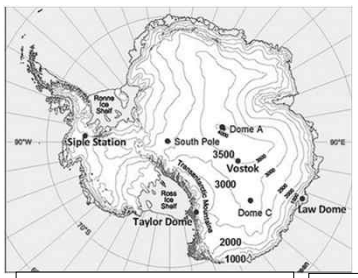


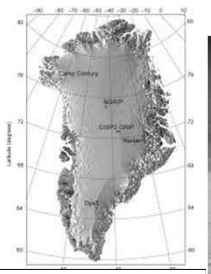


인류 출현 이후(50만년)





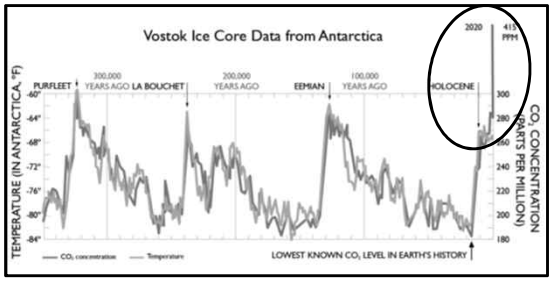




남극 빙핵(81만년 전까지)

그린란드(15만년 전까지

이산화탄소와 기후변화(40만년)

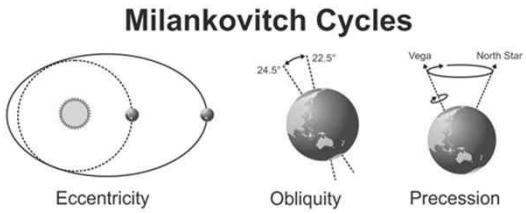


기온 증가➔CO_2 증가(8백년 차이)

이전 간빙기: 낮은 CO_2, 높은 기온

상관관계는 있지만 인과관계(이산화탄소➔기온)는 아님

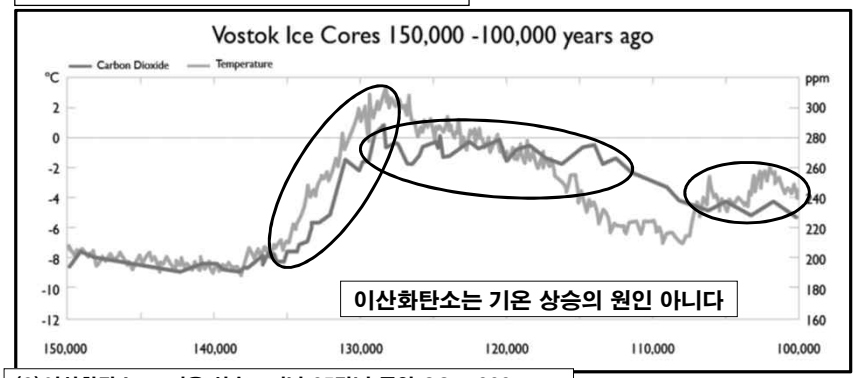
기온 변화는 태양과 지구 거리 각도



빙하기 70,000~125,000년, 간빙기 10,000~15,000년

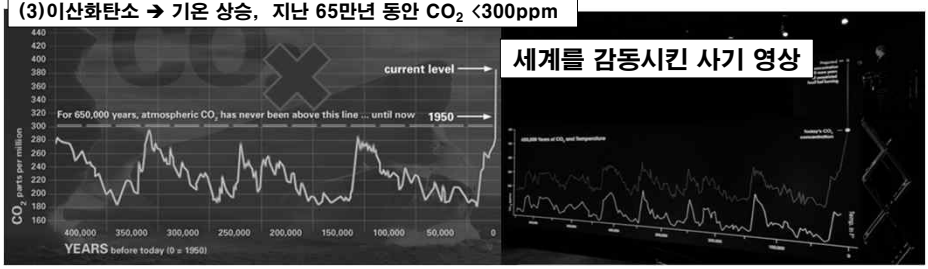
기온 ➔ 바다 수온 ➔ CO_2

관측 사례(150,000~100,000년)



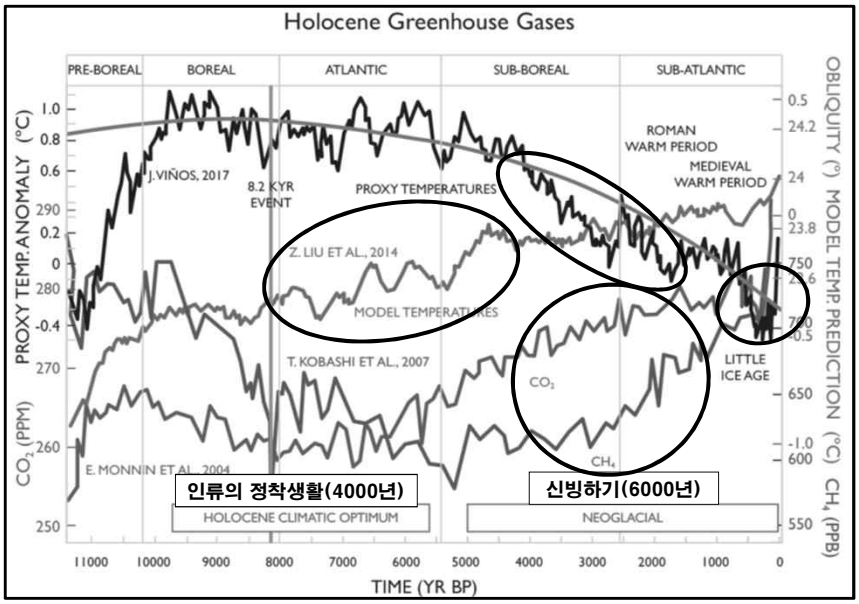
이산화탄소는 기온 상승의 원인 아니다

(3)이산화탄소 ➔ 기온 상승, 지난 65만년 동안 CO_2 <300ppm

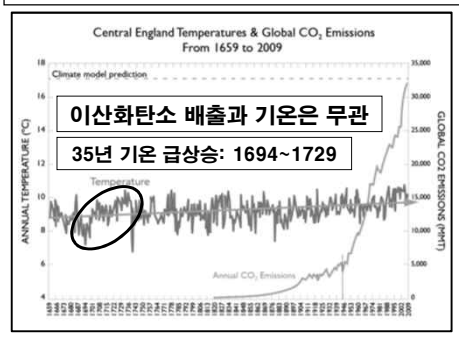


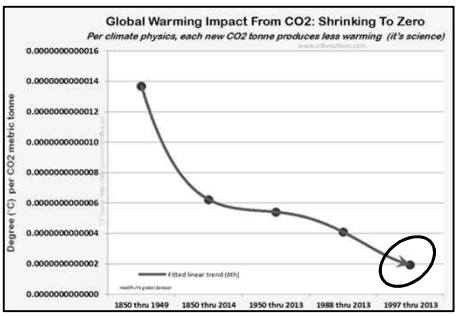
세계를 감동시킨 사기 영상

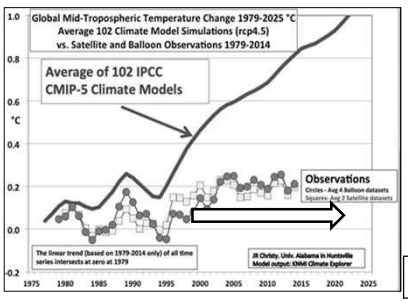
홀로세 간빙기(11,600년, 인류문명)의 기후변화



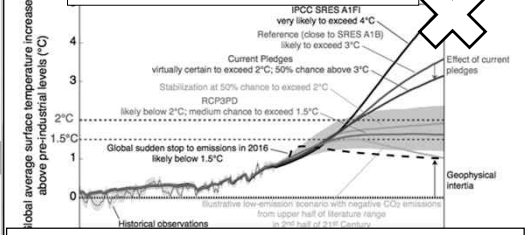
온도계 관측 기온 및 예측 모델 결과







(4)컴퓨터 모델 예측: 최대 6.4°C 증가



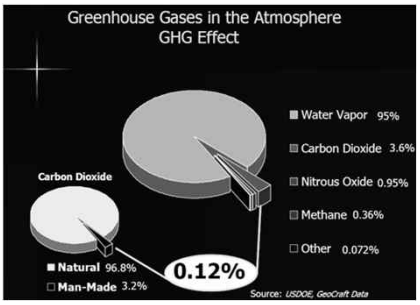
기후 위기론의 4대 과학적 근거 모두 거짓

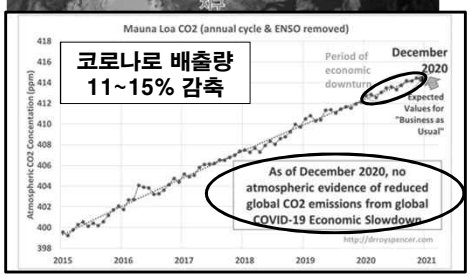
4. 이산화탄소와 화석연료 재평가

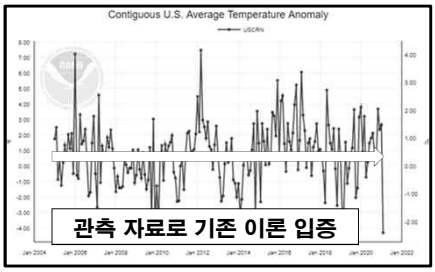
(1)온실효과

이산화탄소 미약한 온실가스

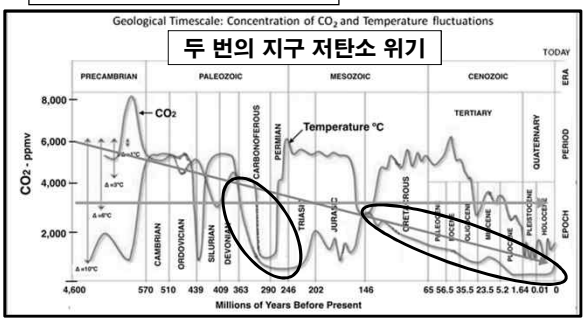
인간에 의한 배출은 소량

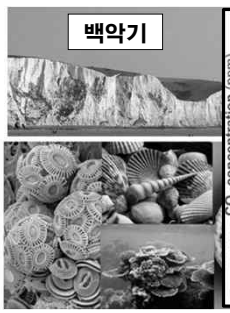


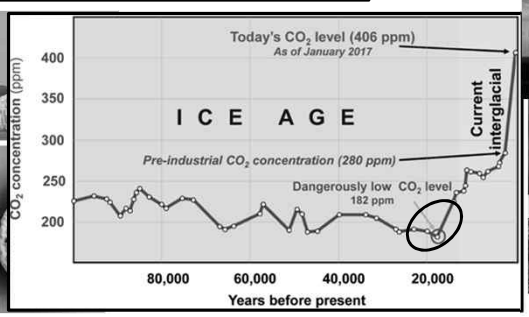


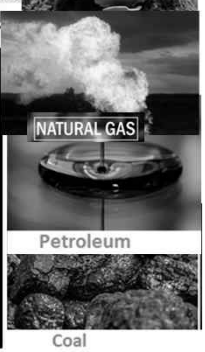


(2)지금은 저탄소 시대



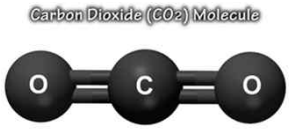


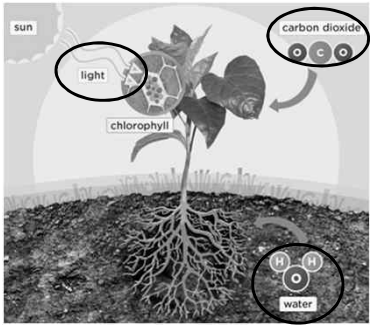




(3)CO_2 상승 생태계 효과

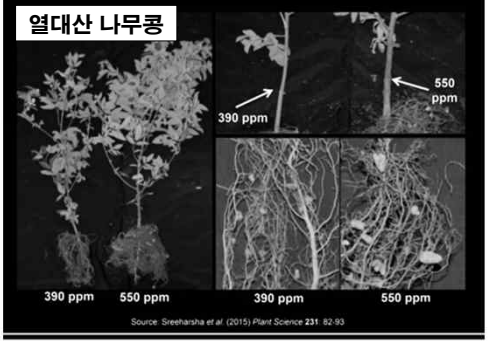
생명의 기초 이산화탄소





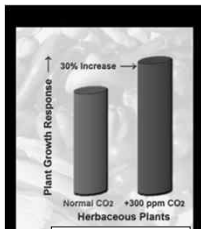
Response of Pigeon pea (*Cajanus cajan* L.) to Elevated CO_2

열대산 나무콩



Source: Sreeharsha et al. (2015) *Plant Science* **231**: 82-93

모든 식물의 성장 촉진

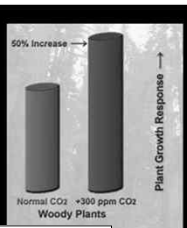


Elevated CO2

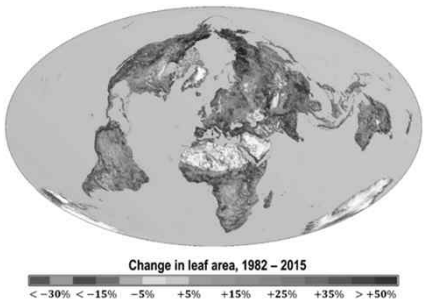
- Increases the number of branches & tillers
- Produces more and thicker leaves
- Enhances roots
- Yields more flowers & fruit

초본 식물

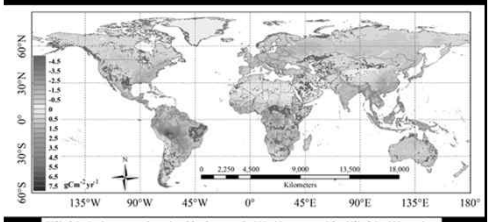
Woody plant growth response to CO2 enrichment is about 1.5 times that observed in herbaceous plant species



목본 식물



Spatial Pattern of Trends in Gross Primary Production (1982-2015)

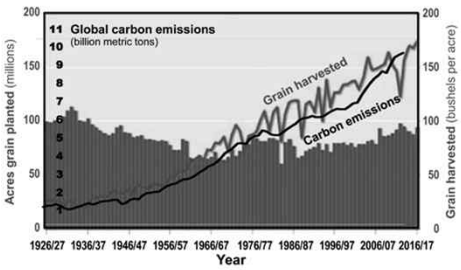


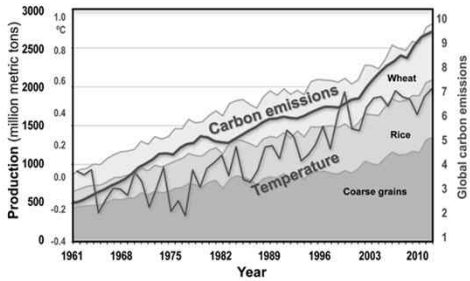
75% of the land area experienced positive increases in GPP. CO2 accounted for 66% of the GPP trends.

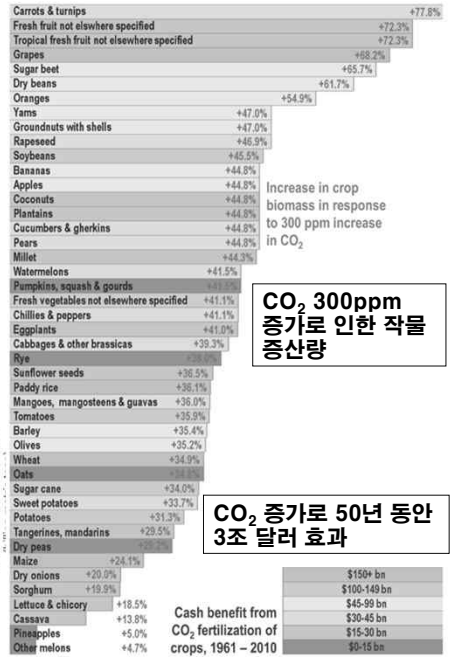
Source: Sun et al. 2018. *Ecological Informatics* **46**: 156-165.

증가된 이산화탄소와 기온 상승 덕분에 지구는 더욱 푸르게 변했다

(4)CO_2 상승 식량 생산 효과



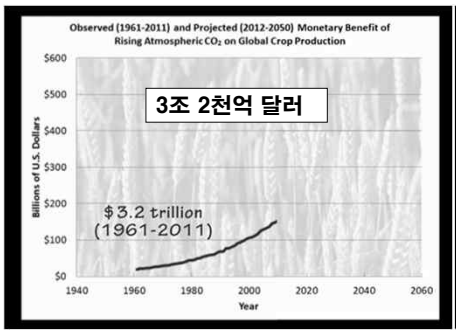


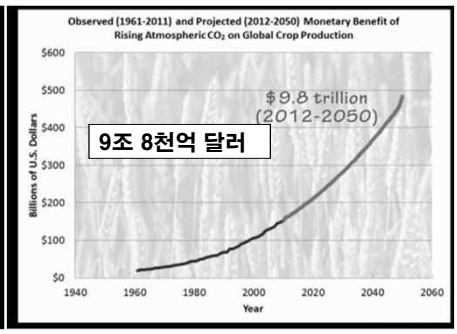


CO_2 300ppm 증가로 인한 작물 증산량

CO_2 증가로 50년 동안 3조 달러 효과

최고의 기아 해결책: 기온 상승과 이산화탄소 증가





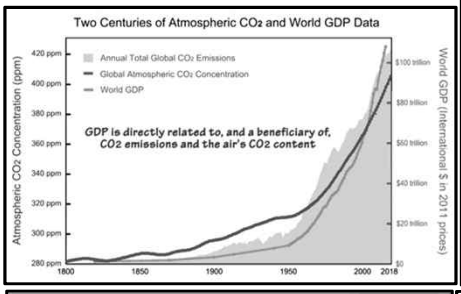
"it should be considered good fortune that we are living in a world of gradually increasing levels of atmospheric CO2"

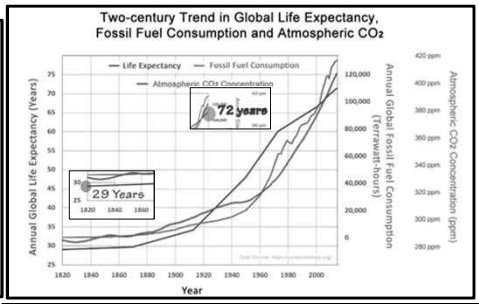
Dr. Sylvan H. Wittwer
Michigan State University

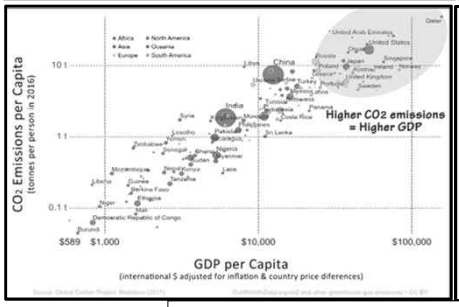
"the rising level of atmospheric CO2 is a universally free premium, gaining in magnitude with time, on which we can all recon for the future"

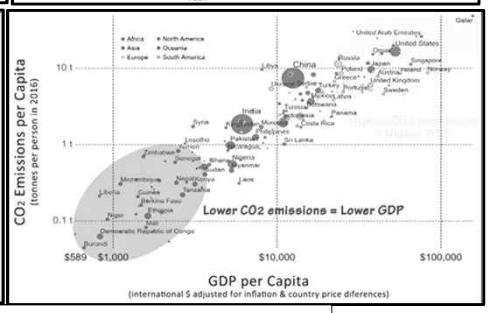
이산화탄소 증가는 전 세계적으로 미래에 이르기까지 공짜로 얻은 행운이다.

(5)화석연료 혜택









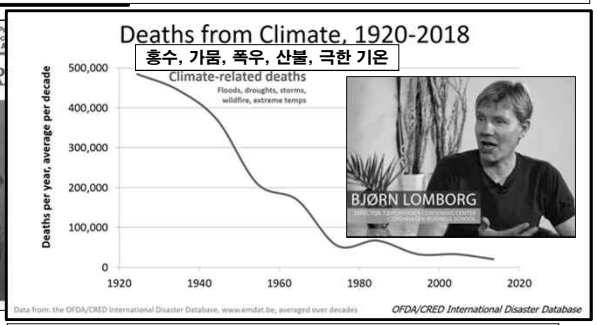
화석연료 덕분에 인류는 더 잘 살고 수명이 길어졌다.

5. 기후 재난 거짓말

[한정애의 내 인생의 책]①2050 거주불능 지구 - 데이비드 월러스 웰즈

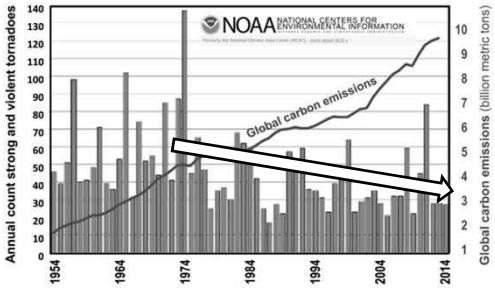
1부 이것은 '자연재해'가 아니다
이미 이산화탄소 한계치를 넘어선 지구,
'자연재해'가 아닌 '대량 학살'의 위기,,,,,,,,,
2부 12가지 기후재난의 실제와 미래
1장 살인적인 폭염, 2장 빈곤과 굶주림, 3장 집어삼키는 바다
4장 치솟는 산불, 5장 '날씨'가 되어버릴 재난들
6장 갈증과 가뭄, 7장 사체가 쌓이는 바다
8장 마실 수 없는 공기, 9장 질병의 전파, 10장 무너지는 경제

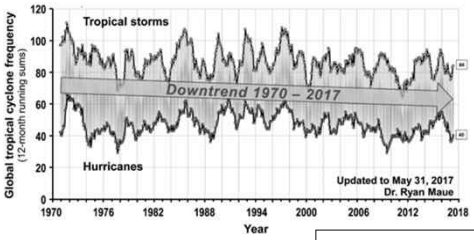
New York Magazine **기자**

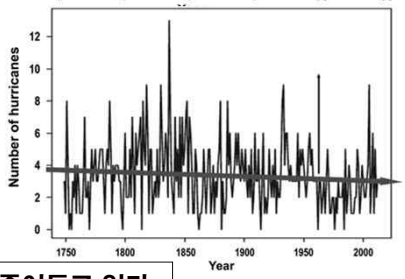


OFDA: OFFICE OF U.S. FOREIGN DISASTER ASSISTANCE

(1)기상 이변이 자주 발생한다.

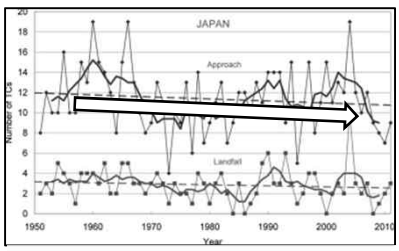


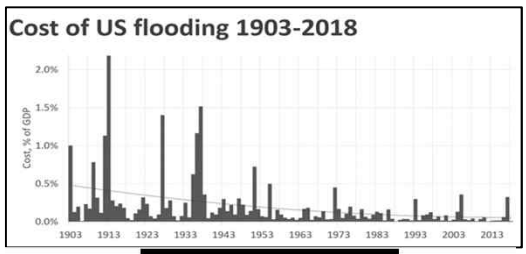




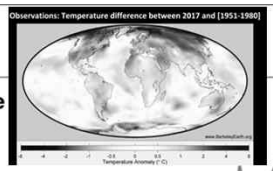
악기상 강도가 줄어들고 있다.

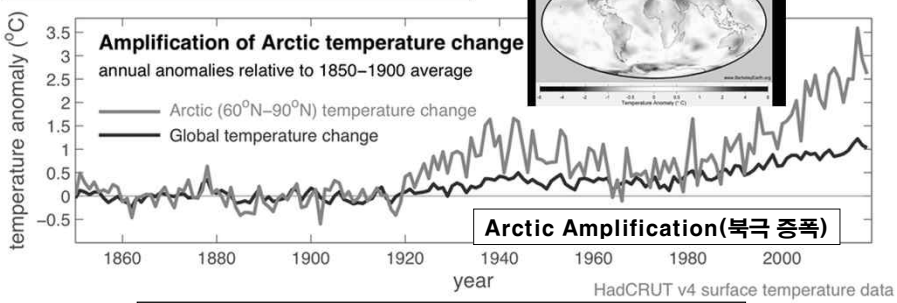
태풍과 홍수





지구온난화로 기후 재난이 줄어드는 이유

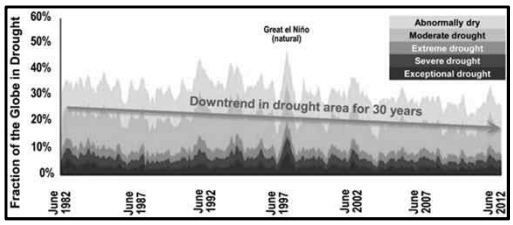


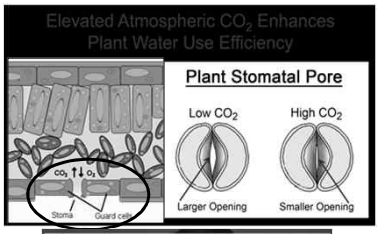


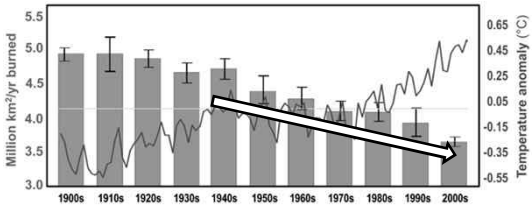
Arctic Amplification(북극 증폭)

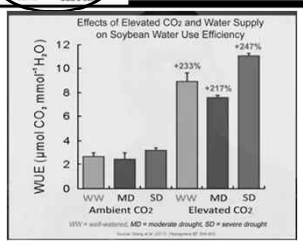
지구온난화로 인해 극지방이 더 빨리 더워진다(수분).

(2)가뭄과 산불이 증가한다.

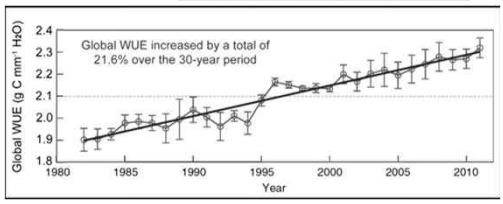






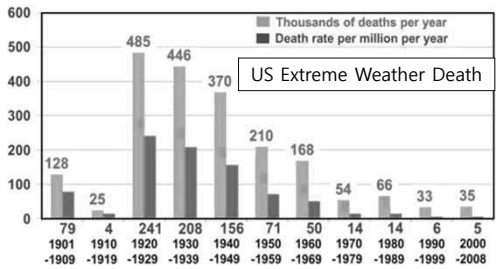


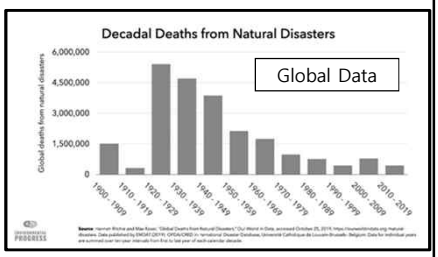
가뭄: 자연 생태계에서 식물 생존에 필요한 최소한의 물이 공급되지 않을 경우

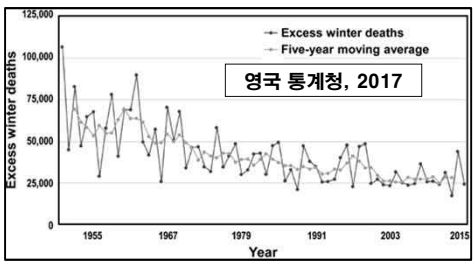


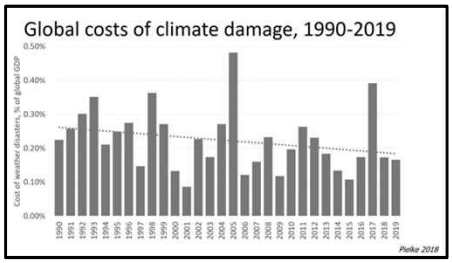
물 사용 효율 증가로
가뭄과 산불이 줄어든다.

(3)기후 사망자 증가한다.





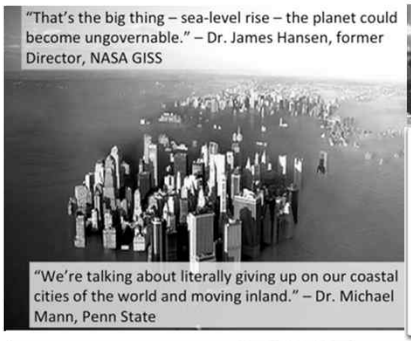




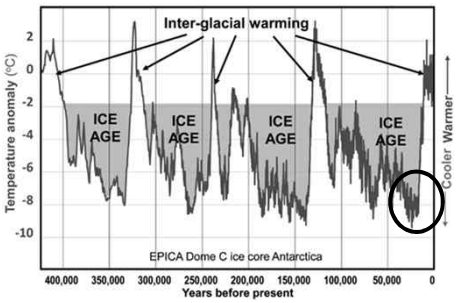
인간은 열대종, 불, 옷, 집을 사용하면서
지구 곳곳으로 이주하게 되었다.

더위는 생명을 주고,
추위는 죽음을 가져온다.

(4)해안 도시가 침수된다.

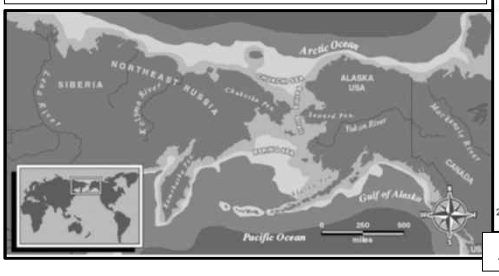


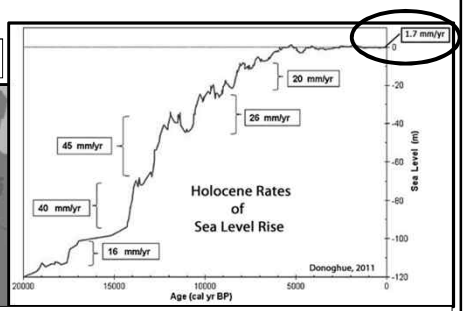
해수면 상승: 빙하기와 간빙기에 일어나는 현상



지난 빙하기 동안 해안선

지난 빙하기 동안 아메리카와 아시아 연결





지금은 해수면 상승률이 가장 낮은 시기

관측 사례

태평양 하와이

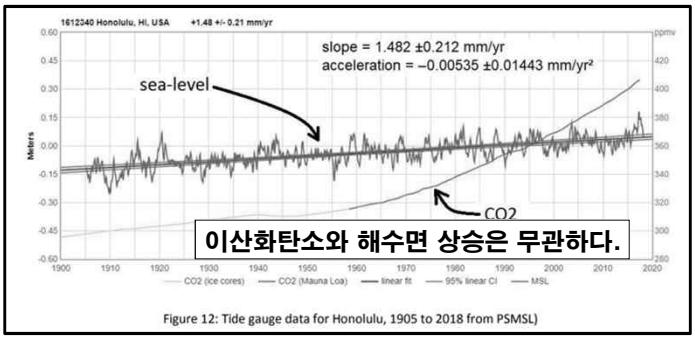
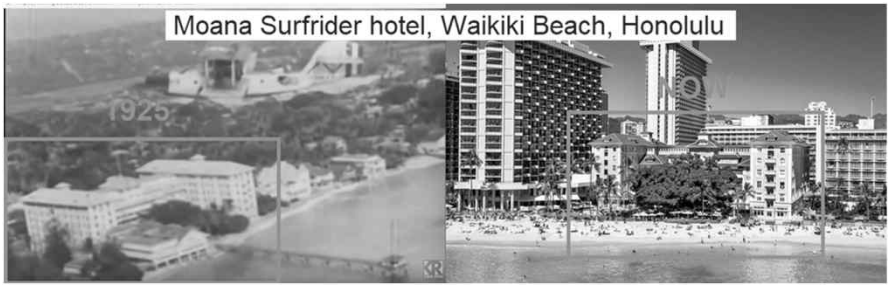
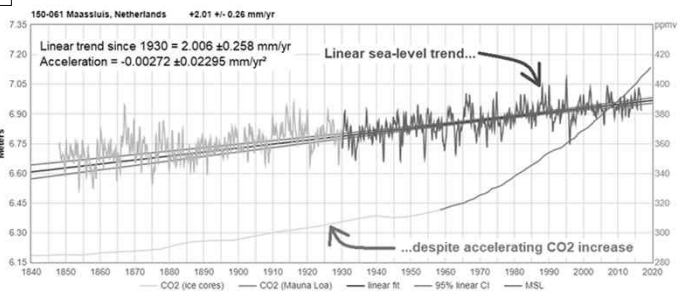
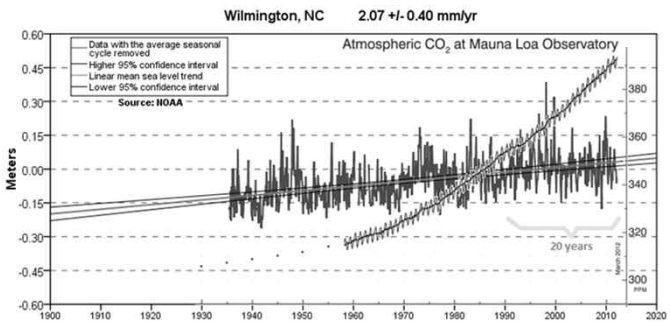


Figure 12: Tide gauge data for Honolulu, 1905 to 2018 from PSMSL)

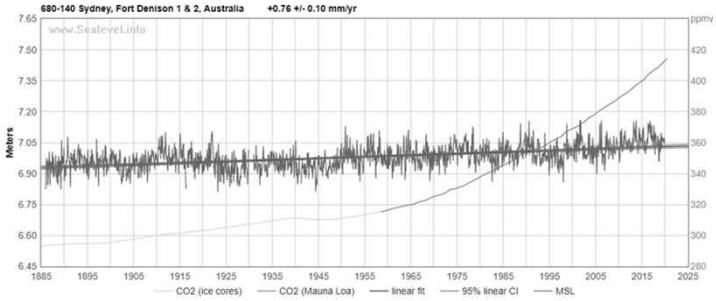


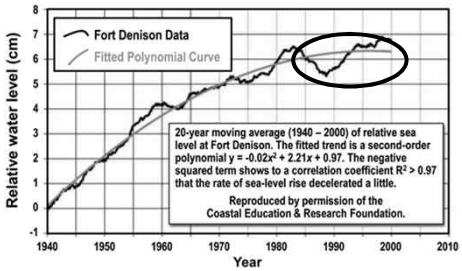
유럽과 미국 대서양

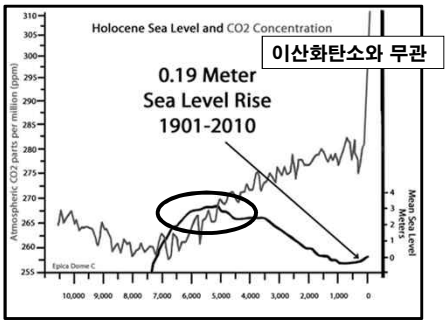




호주 시드니 포트 데니슨





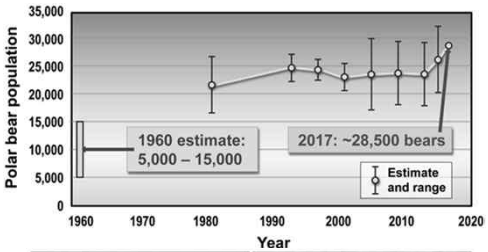


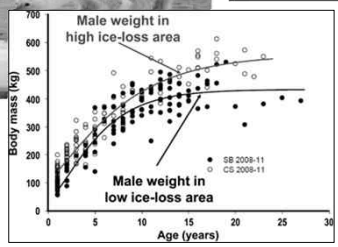
이산화탄소와 무관

상승 속도가 줄어들고 있다.

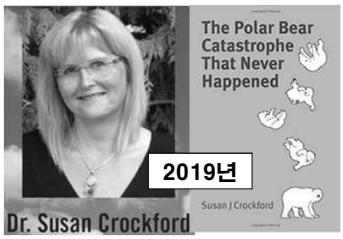
(5)빙하와 북극곰이 사라진다.

북극곰은 증가하고 있다

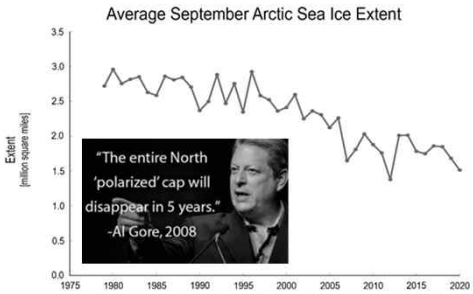


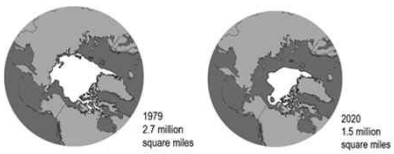


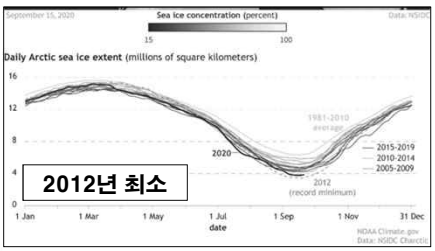
1973년 미국, 캐나다. 러시아, 노르웨이, 덴마크가 북극곰 보전 국제 협약에 서명 사냥 금지로 인해

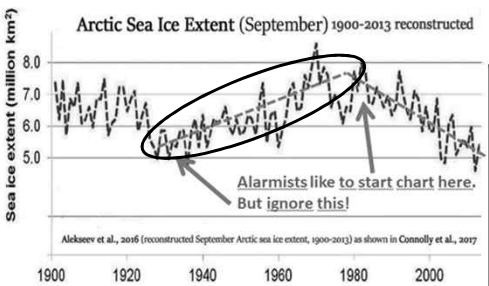


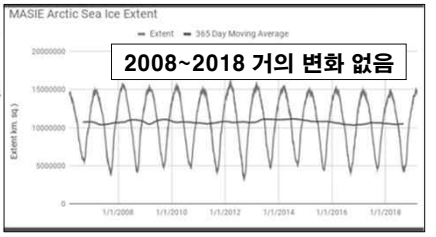
북극 바다 빙하의 진실



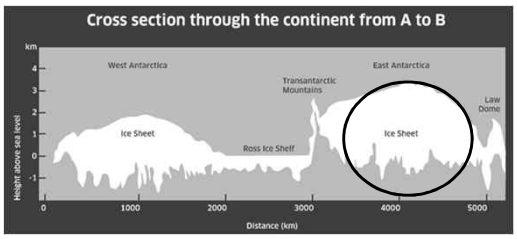




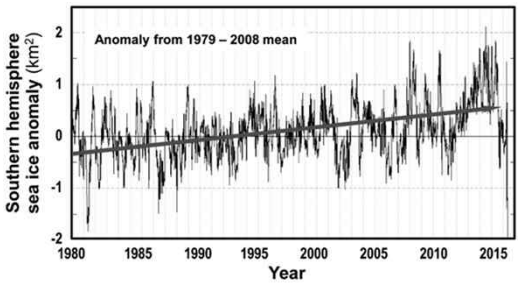




남극 빙하는 증가하고 있다

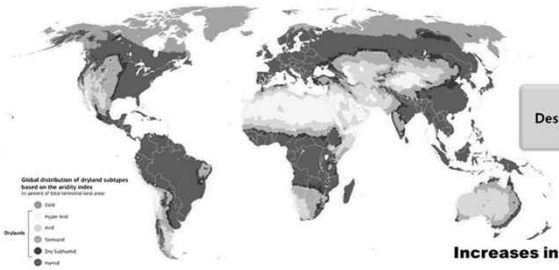


언론 보도 지점



해류로 인해 남극 서쪽과 반도에서 빙붕(Ice Shelf) 붕괴를 언론 보도

(6)사막이 늘어나고 식량 위기 온다.



Desertification
- Caused by Human Activity
- Caused by Climate Changes (non-human induced)

Increases in soil moisture and CO_2 fertilization are "greening" the Earth

2013 CSIRO Australia Deserts 'greening' from rising carbon dioxide
https://www.sciencedaily.com/releases/2013/07/130708103521.htm

The New York Times

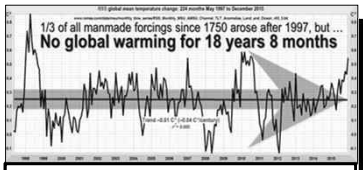
Climate Change Threatens the World's Food Supply, United Nations Warns

지구는 더욱 푸르게 변했고,
식량 생산은 증가하고 있다.

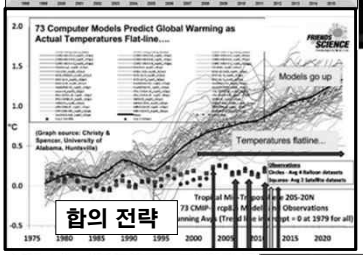
3조 2천억 달러(1961~2011), 9조 8천억 달러(2012~2050)

6. 정치사회적 현황과 전망

과학자 97%가 합의했다.



1993~2003년까지 10년



합의 전략

Naomi Oreskes(2004)

Benny Peiser(2005)

THE GLOBAL WARMING POLICY FOUNDATION

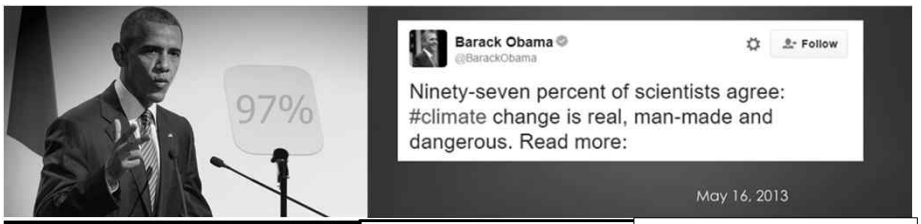
GWPF

Director: Dr Benny Peiser

1126편 중 13편만 기후변화가 인간에 의한 것

Al Gore said zero scientists disagreed with manmade global warming.
Peiser re-ran Oreske's research & showed
only 13 of 1126, or ~1%, explicitly agreed – most had NO POSITION .

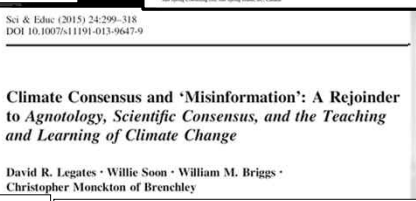
오바마의 97%(2013년)

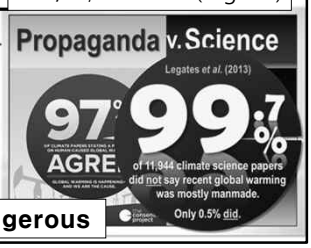


2013년

11,944편 조사
7,930편 No Opinion
4,014편 Opinion
3,896편 Some Warming
41편 Most Warming
3,896/4,014=97.1%(Cook)
41/11,944=0.003(Legates)

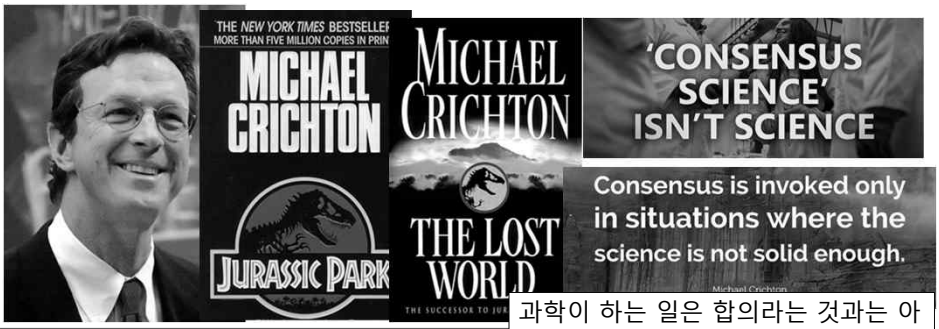
David Legates(2015년)





Some(33%) ➔ Most ➔ Dangerous

과학과 합의(Science and Consensus)



The greatest scientists in history are great precisely because they broke with the consensus. There is no such thing as consensus science. If it's consensus, it isn't science. If it's science, it isn't consensus. Period.

— Michael Crichton —

과학이 하는 일은 합의라는 것과는 아무런 관련이 없다. 합의란 정치에서나 하는 비즈니스다. 과학이란 이것과는 반대로 정답을 아는 단 한 명의 연구자만을 필요로 한다. 역사상 가장 위대한 과학자들은 그들이 합의라는 것으로부터 단절했기 때문에 위대한 것이다. 합의라는 과학은 없다. 만약 그것이 합의된 것이라면 그것은 과학이 아니다. 만약 그것이 과학이라면 그것은 합의된 것이 아니다.

기후 위기론자들의 몰락

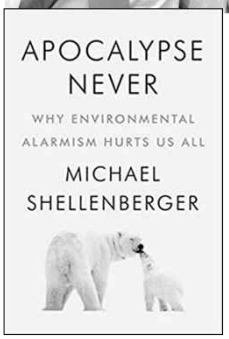
기후 위기론자들의 전향

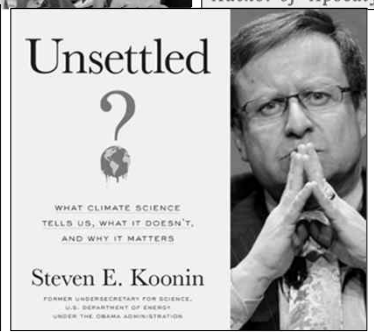
On behalf of environmentalists everywhere, I would like to formally apologize for the climate scare we created over the last 30 years.

Climate change is happening. It's just not the end of the world. It's not even our most serious environmental problem.

MICHAEL SHELLENBERGER
Former Climate Alarmist
Author of "Apocalypse Never"

ENVIRONMENTAL PROGRESS

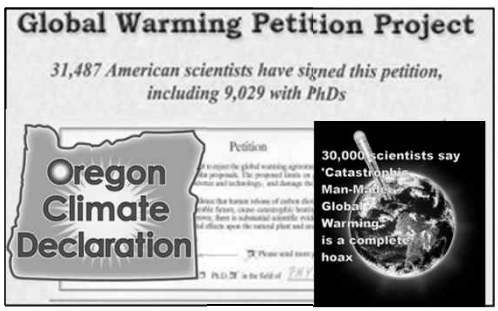


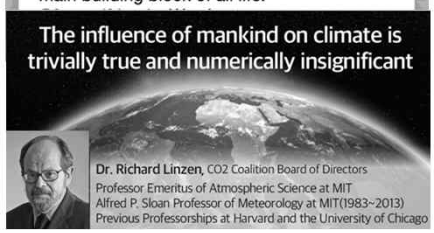


미국의 파리기후협약 탈퇴

Donald J. Trump
@realDonaldTrump

Patrick Moore, co-founder of Greenpeace: "The whole climate crisis is not only Fake News, it's Fake Science. There is no climate crisis, there's weather and climate all around the world, and in fact carbon dioxide is the main building block of all life."

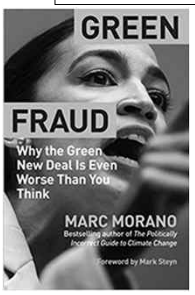


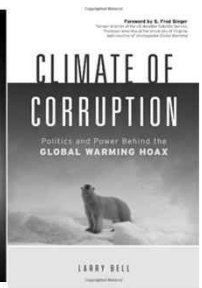


미국의 녹색 뉴딜

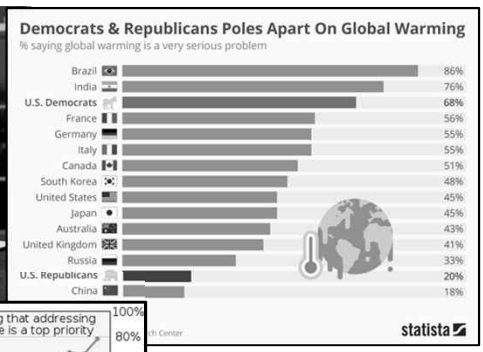
Alexandria Ocasio-Cortez said "The world is going to end in twelve years if we don't address climate change."

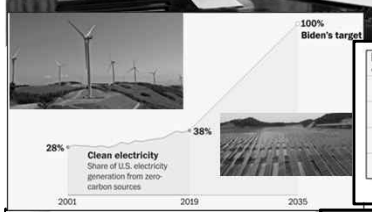
She was previously worked as a waitress and bartender before running for Congress in 2018.

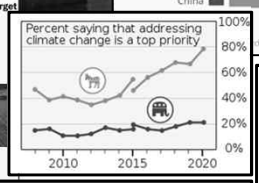


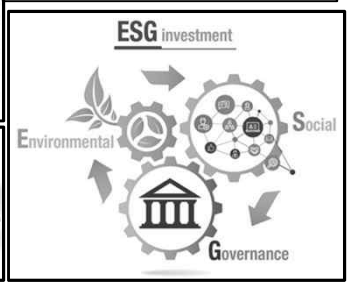


바이든 정부의 재가입





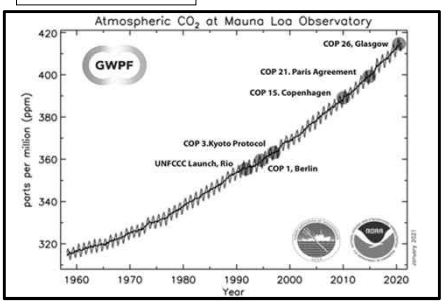


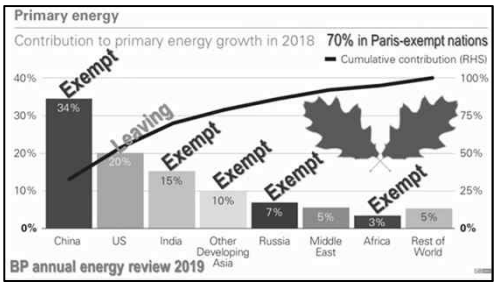


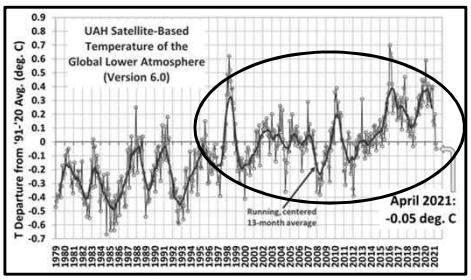
유엔 기후협약 전략

유엔 P4G

미래 전망



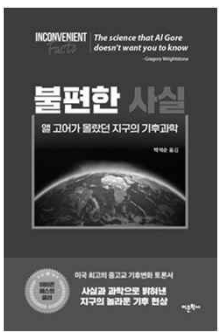


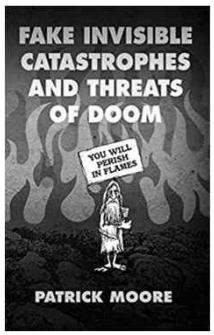


지구의 CO_2 상승은 멈출 수도, 필요도 없다.

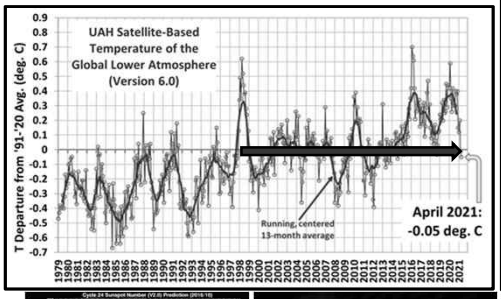
기후 대재앙은 낭설, 지금은 축복 받은 시기

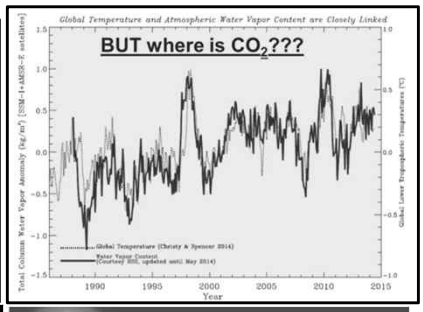
-참고 자료-

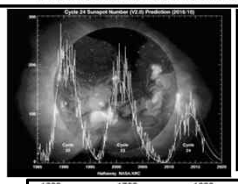


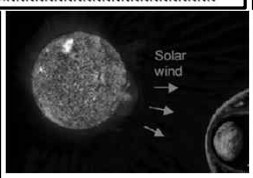


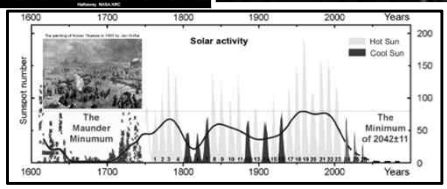
지구 기온 결정 요인

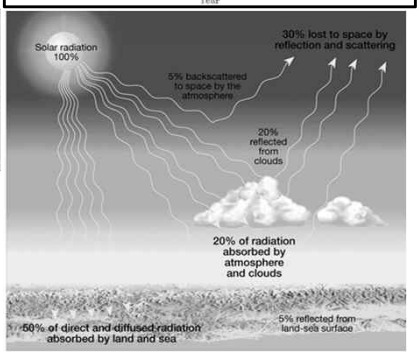


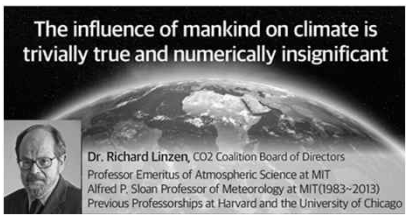












The Heartland INSTITUTE

www.heartland.org

GWPF The Global Warming Policy Foundation

www.thegwpf.org

GREGORY WRIGHTSTONE

www.friendsofscience.org

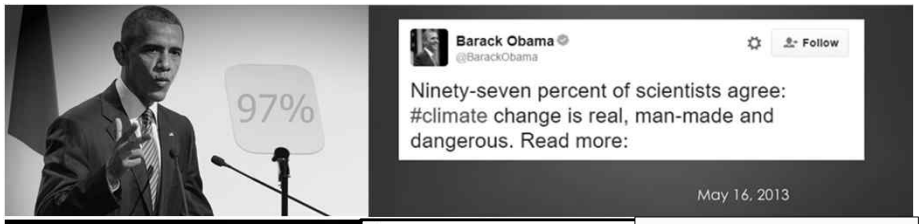
CO_2 COALITION

www.co2coalition.org

www.co2science.org

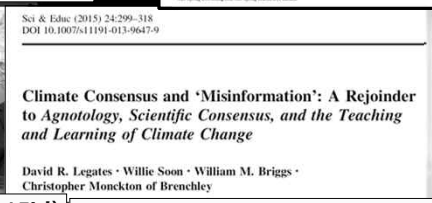
www.human-environment.org

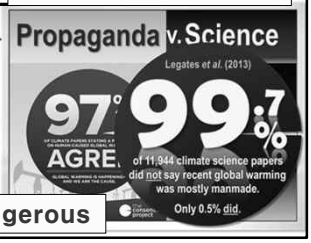
오바마의 97%(2013년)



2013년

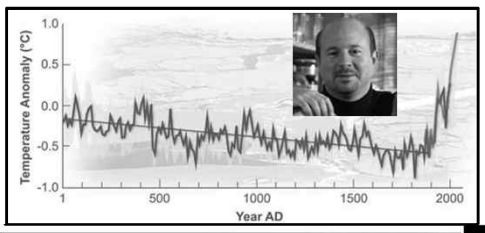
11,944편 조사
7,930편 No Opinion
4,014편 Opinion
3,896편 Some Warming
41편 Most Warming
3,896/4,014=97.1%(Cook)
41/11,944=0.003(Legates)

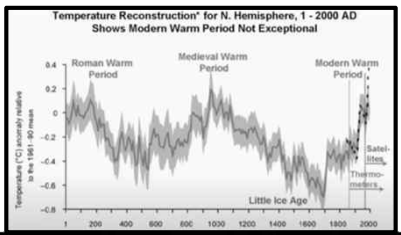


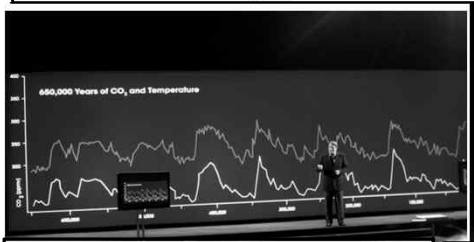


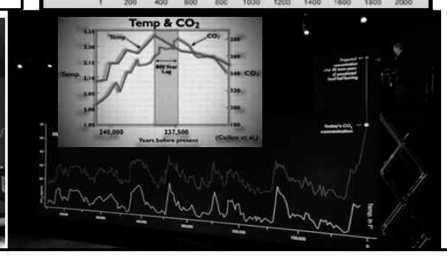
David Legates(2015년)

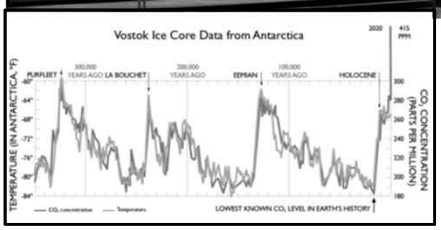
Some(33%) ➔ Most ➔ Dangerous

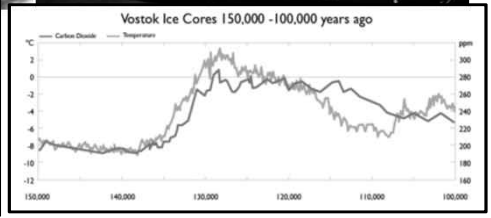




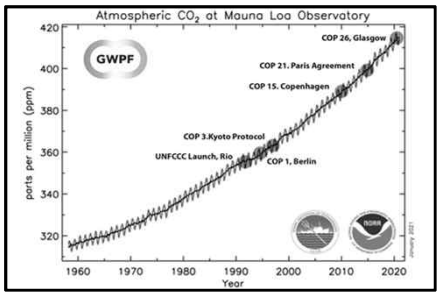


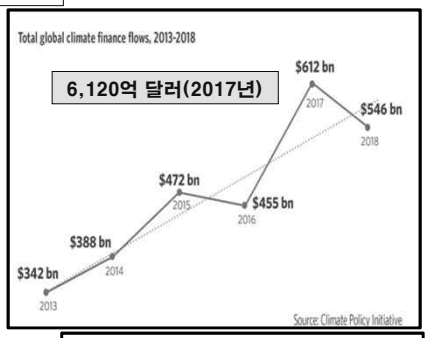


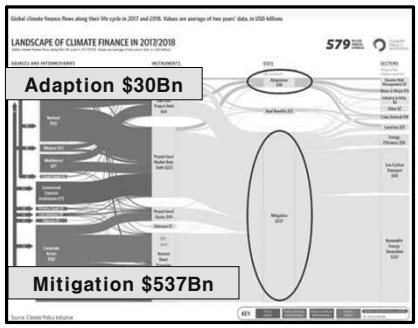




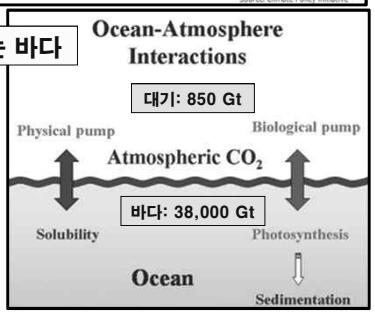
기후협약에 따른 온실가스 감축 효과는 0



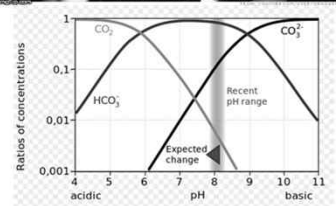


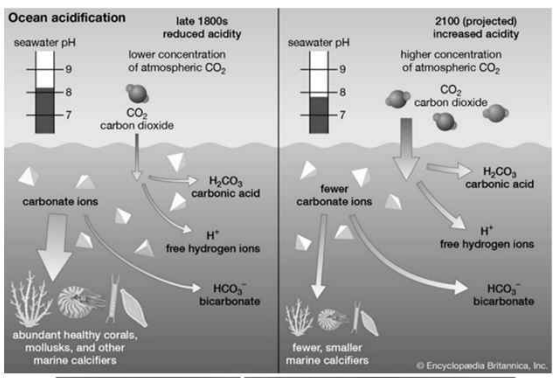


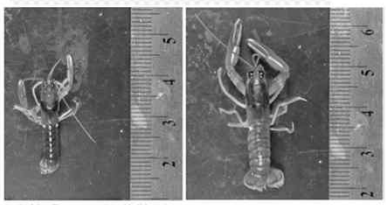
이유는 바다



바다가 죽는다: 해양 산성화

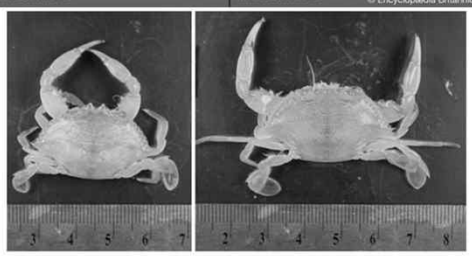






American Lobster (*Homarus americanus*) reared for 60 days under pCO_2 = 400 ppm (credit Justin Ries, UNC-Chapel Hill)

American Lobster (*Homarus americanus*) reared for 60 days under pCO_2 = 2850 ppm (credit Justin Ries, UNC-Chapel Hill)



Blue crab (*Callinectes sapidus*) reared for 60 days under pCO_2 = 400 ppm (credit Justin Ries, UNC-Chapel Hill)

Blue crab (*Callinectes sapidus*) reared for 60 days under pCO_2 = 2850 ppm (credit Justin Ries, UNC-Chapel Hill)

박석순 교수의 발제에 대한 토론 요지

토론자: 김정호

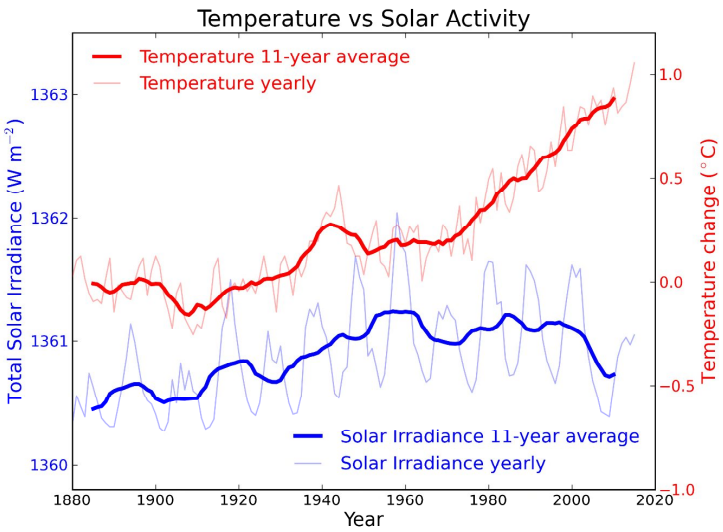
순서

1. 기존 Critical Review에 대한 입장은? 태양 흑점 효과 사례

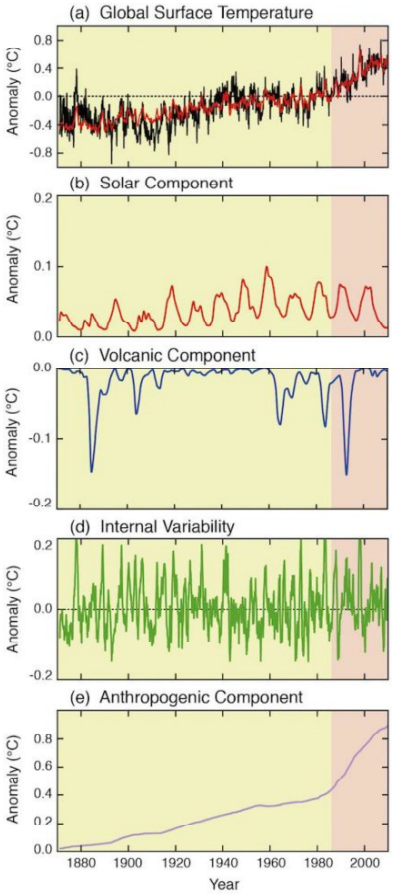
2. 진실과 무관한 인간심리-시장-정치: 저항 또는 적응, 어느 쪽이 나은가?

- ESG Investing-consumption
- Carbon Tax/tariff

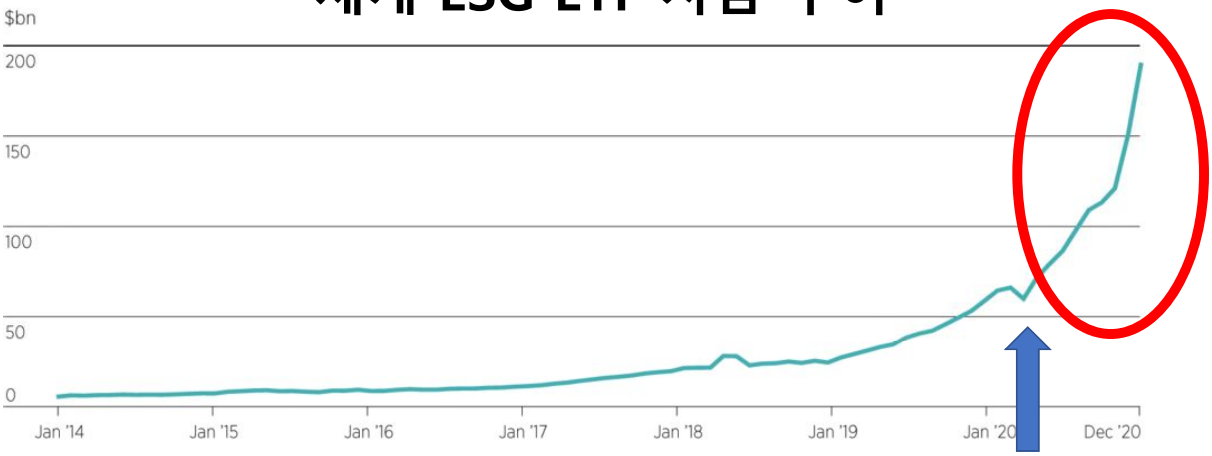
지구 기온과 태양 활동



https://skepticalscience.com/solar-activity-sunspots-global-warming.htm



세계 ESG ETF 자금 추이



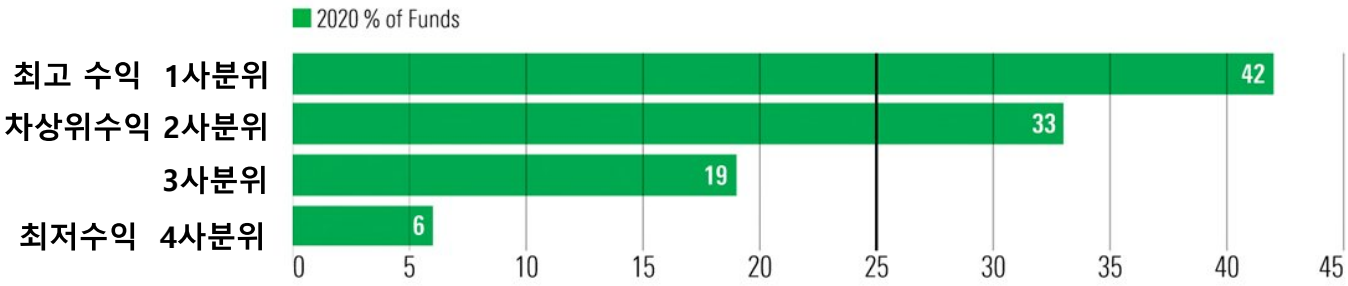
1890억달러
2020년말

연초 대비
223% 증가

코로나 사태 발발

https://esgclarityasia.com/esg-etf-assets-surge-220-in-2020/

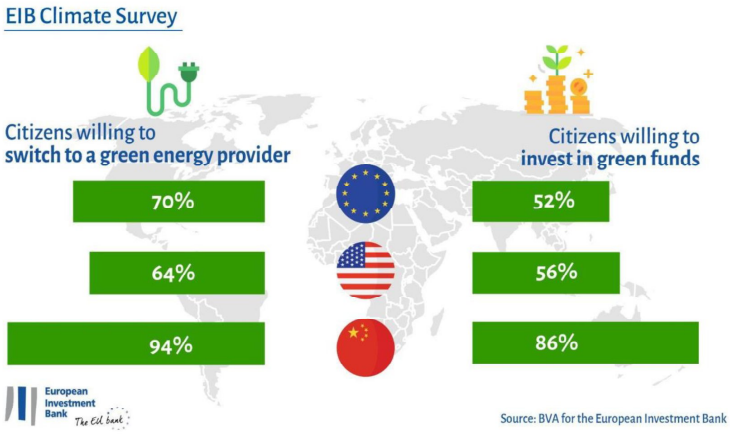
ESG ETF 의 수익성 분포



https://www.morningstar.com/articles/1017056/sustainable-equity-funds-outperform-traditional-peers-in-2020

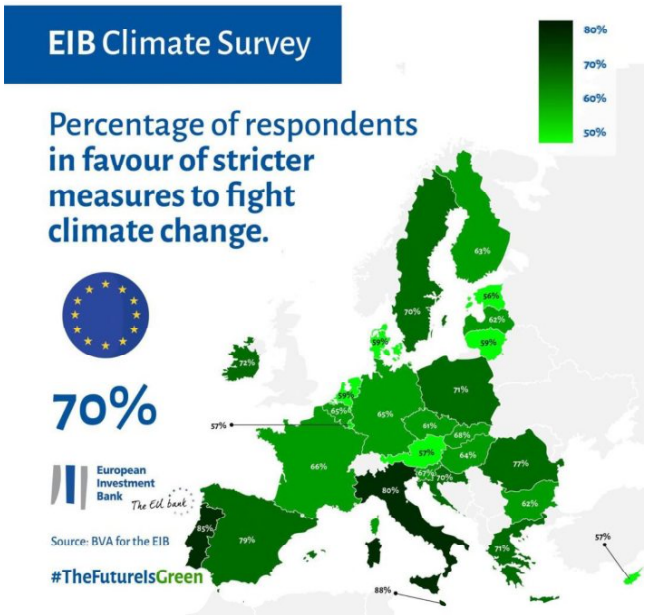
코로나 이후 ESG 투자 급증 이유

1. 코로나 → 인류가 환경, 위생, 위험 등에 예민해짐
2. 투자자, 소비자들 ESG 기업 선호, 반ESG 기업 혐오
3. 신재생 에너지 등에 대한 정부 투자 및 지원금 급증
4. ESG 투자 수익률 상승



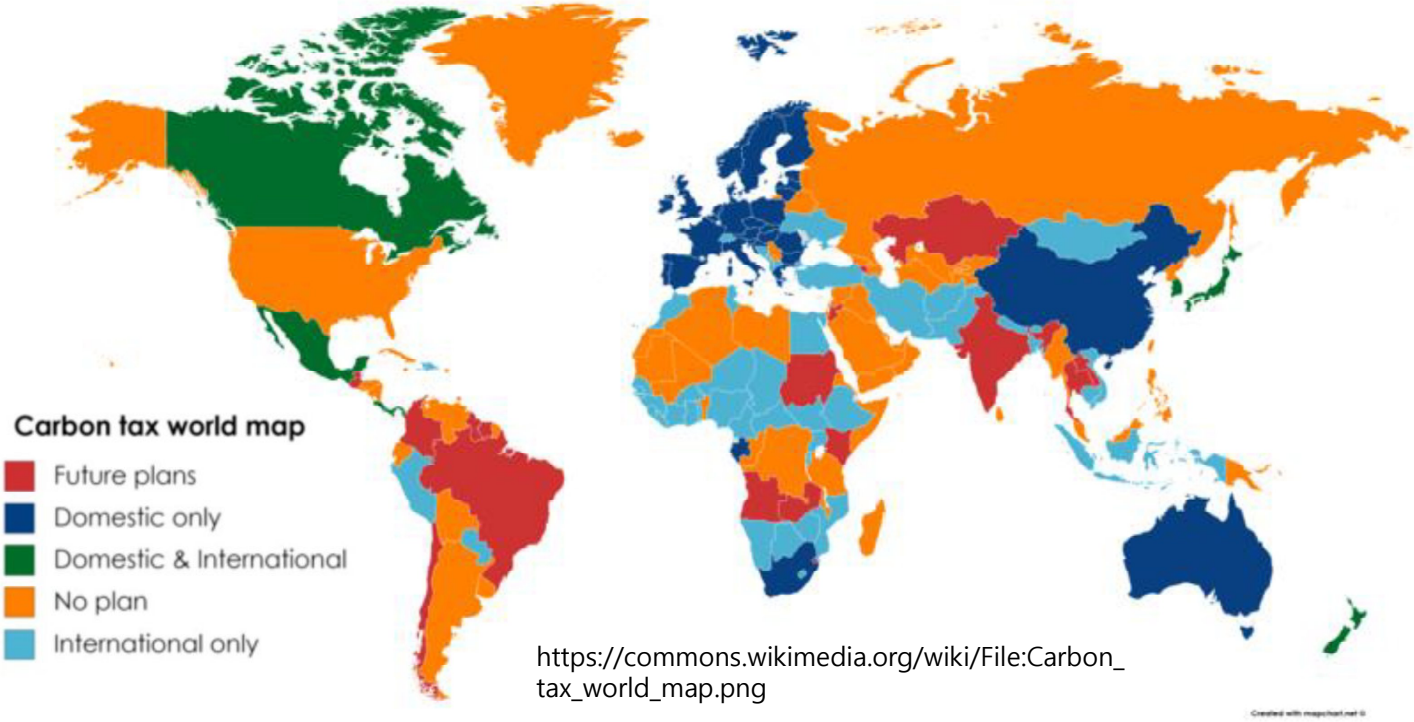
https://www.eib.org/en/infographics/home-heating-and-climate-conscious-consumption

조사시기: 2020년

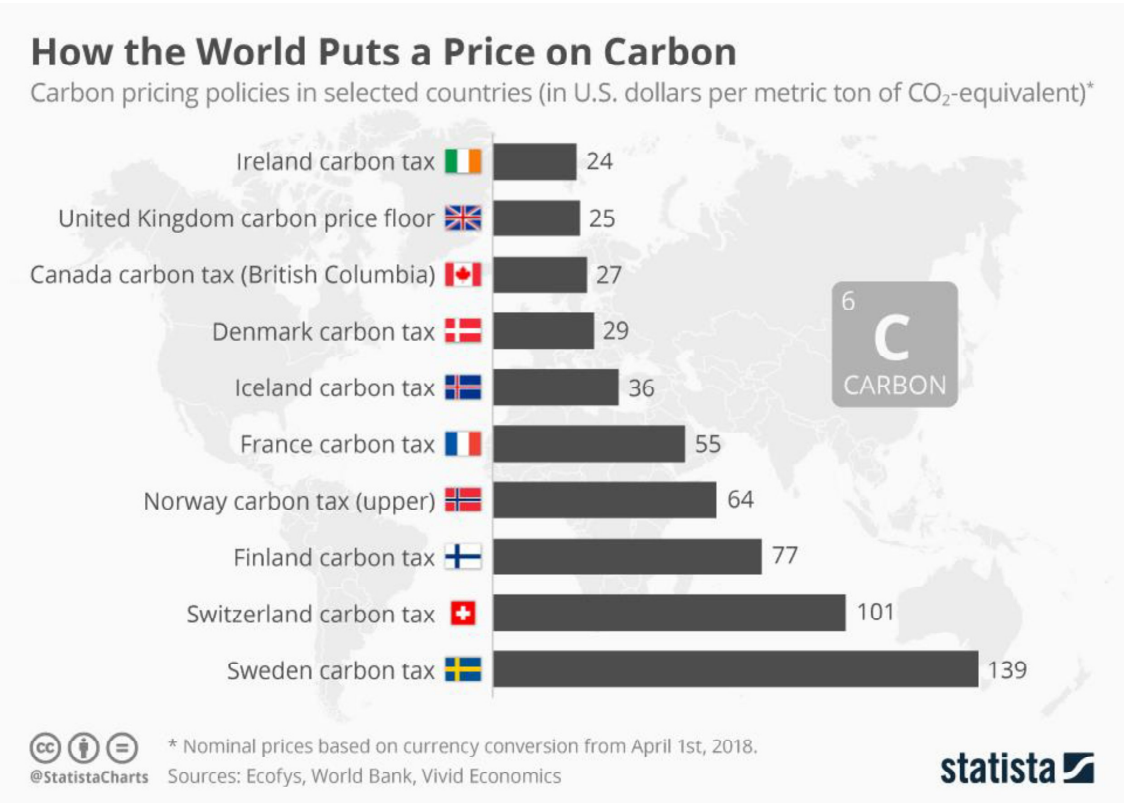


세계의 탄소세 상황.

어떻게 하나? 역행 또는 적응?



https://commons.wikimedia.org/wiki/File:Carbon_tax_world_map.png



https://www.statista.com/chart/17095/highest-carbon-taxes-in-the-world/


благодаря
merci
köszönöm
danke
hvala
thank you
tak
grazie
kiitos
ačiū
takk
grazzi
xièxiè
paldies
dank u
tak
faleminderit
hvala
gracias
mh'gol
gracies
takk
tänan
mahalo
hvala
obrigado
shukran
děkuji
tack