



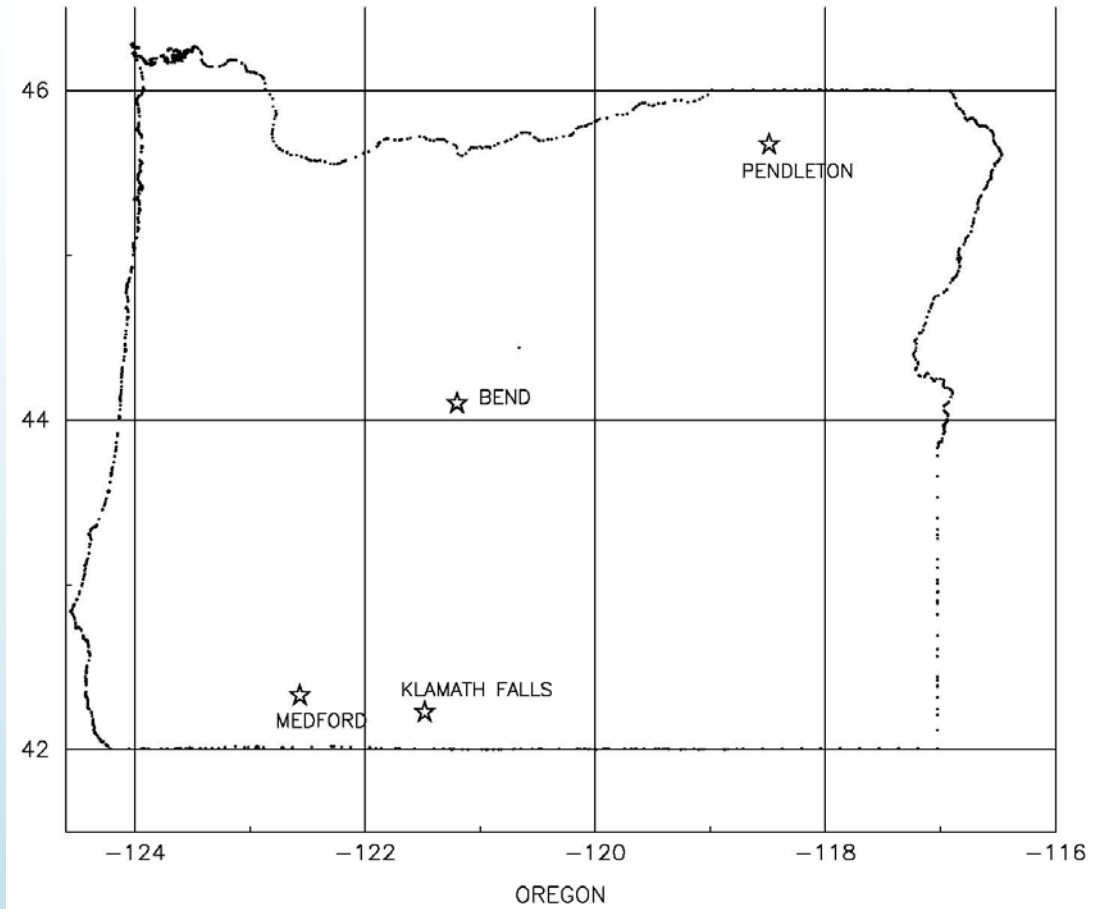
Oregon Temperature Review

JARED L. BLACK, Sc.D.



Temperatures Reviewed

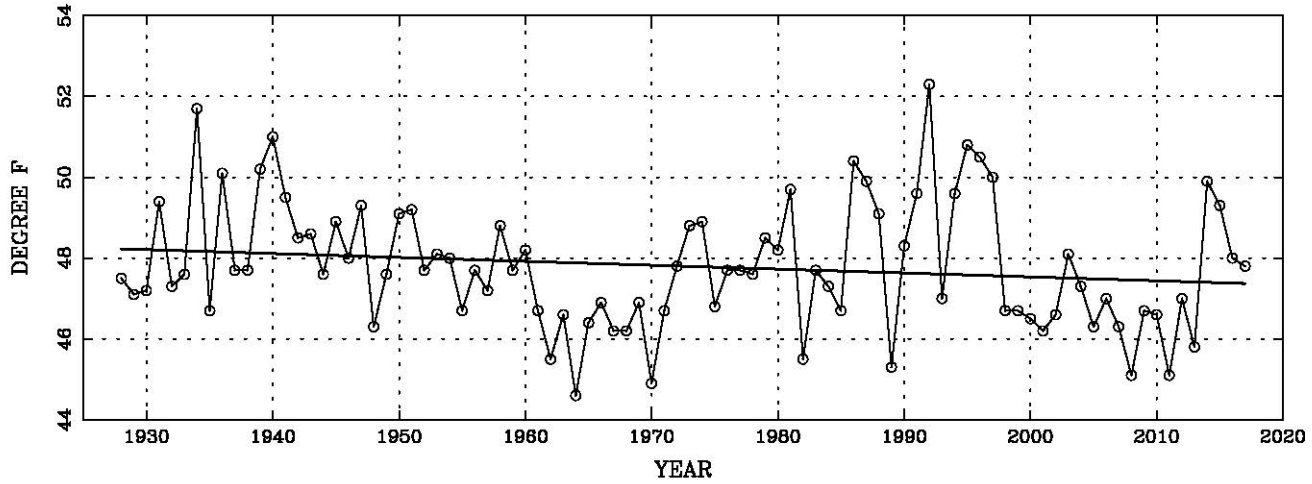
- Oregon Measurements
- Oregon Calculated (Average)
- Satellite Measurements
 - Global And Regional
- Calculated Global Averages



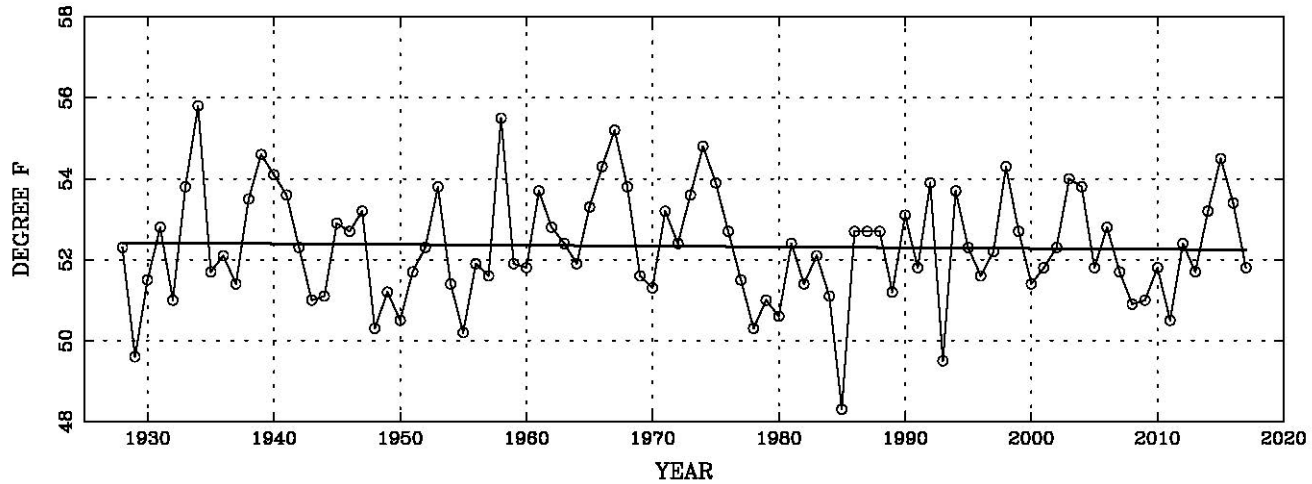
TEMPERATURE DATA FROM FOUR OREGON CITIES ARE ANALYZED AND COMPARED WITH OREGON STATE UNIVERSITY PREDCTIONS. OSU PREDICTED 2 DEGREE F INCREASE FROM 1990 TO 2016.



**KLAMATH FALLS TEMPERATURE
ANNUAL AVERAGE**



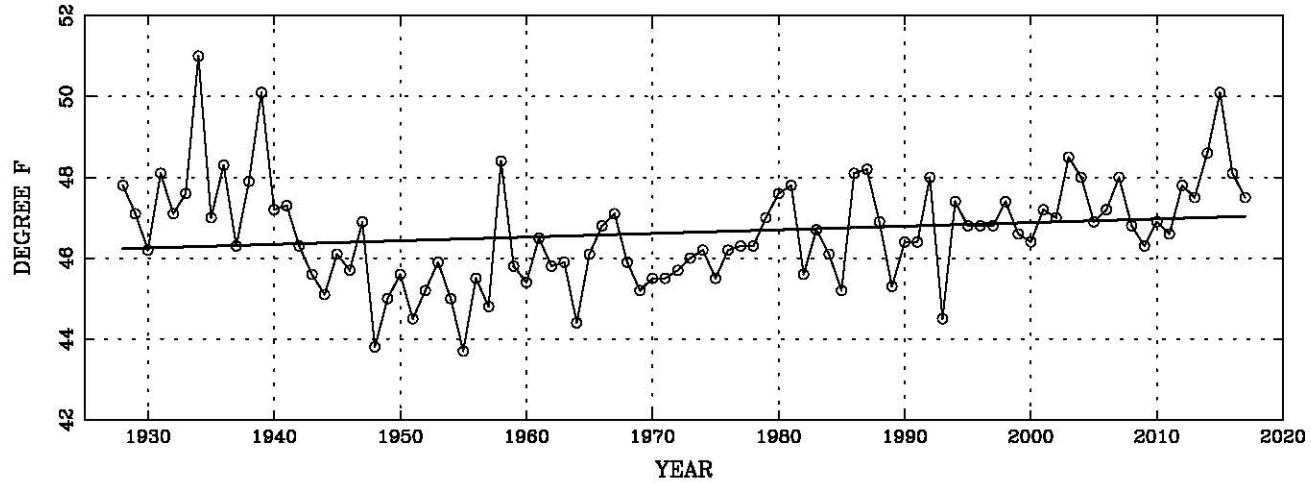
**PENDLETON TEMPERATURE
ANNUAL AVERAGE**



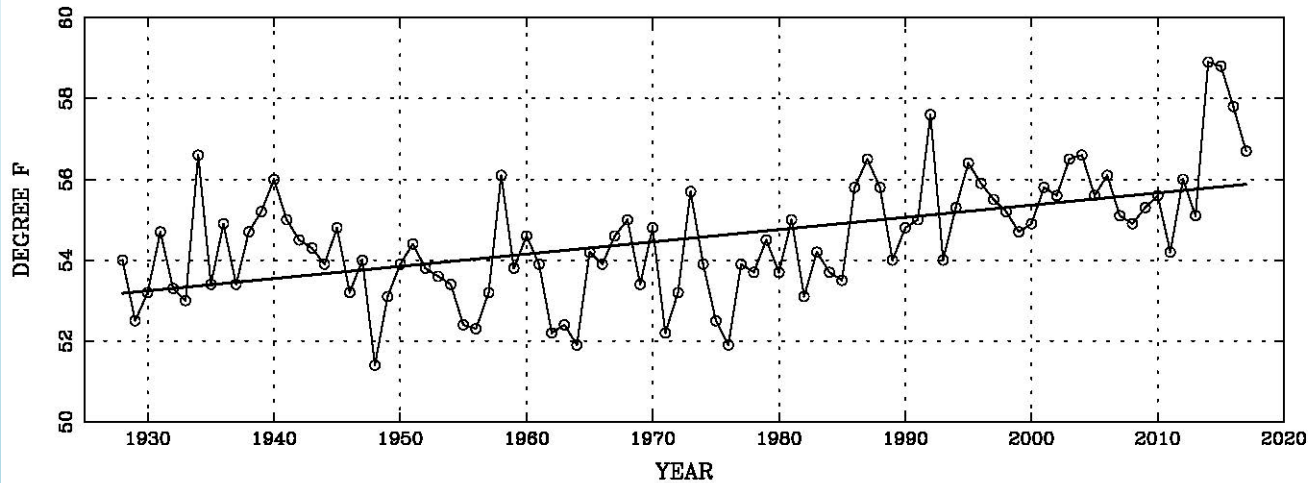
KLAMATH FALLS AND PENDLETON ANNUAL AVERAGE TEMPERATURE



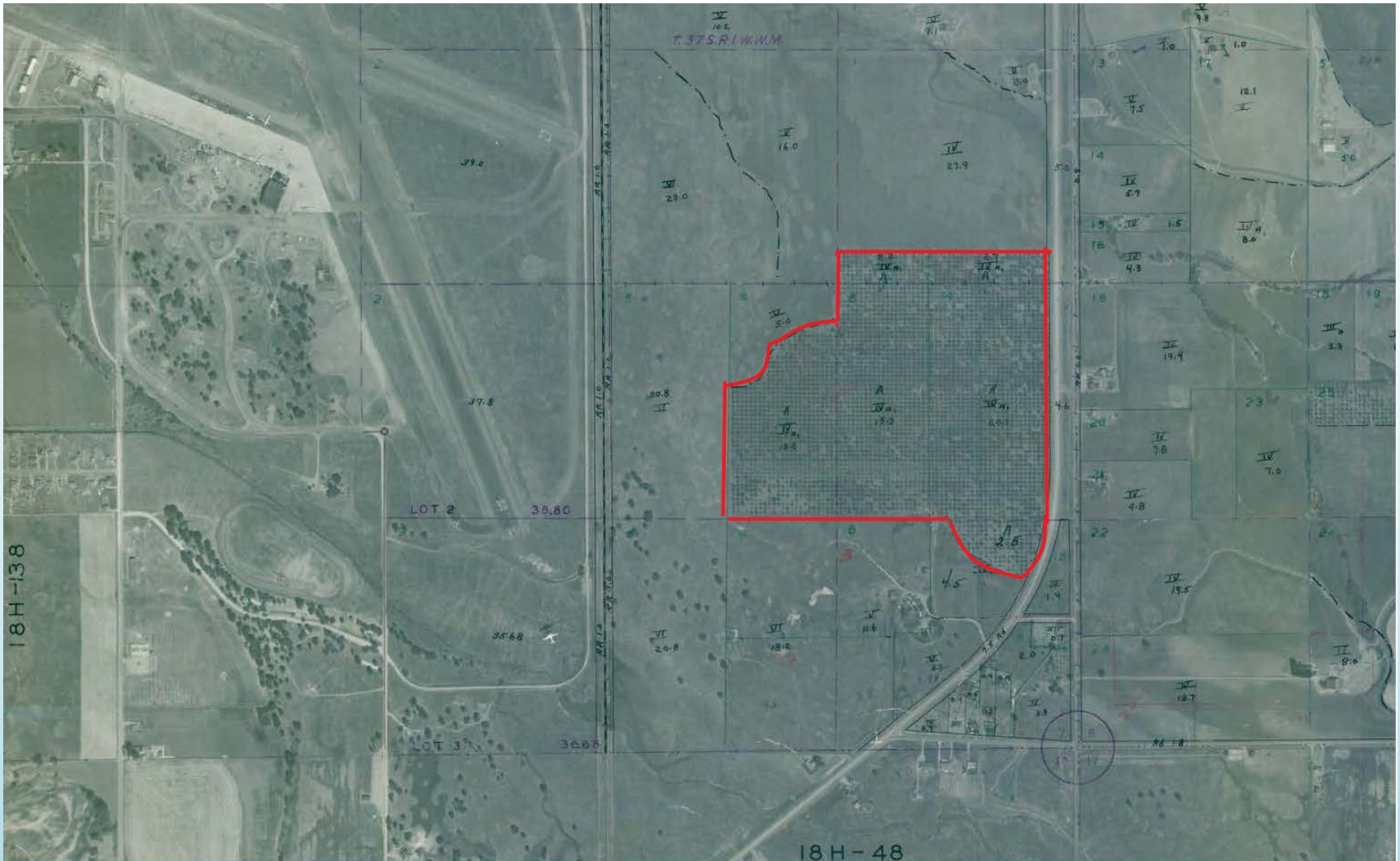
BEND TEMPERATURE
ANNUAL AVERAGE



MEDFORD TEMPERATURE
ANNUAL AVERAGE



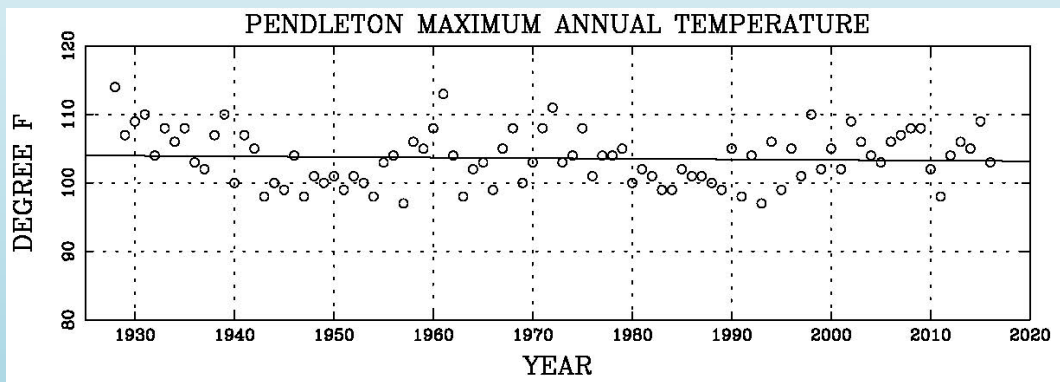
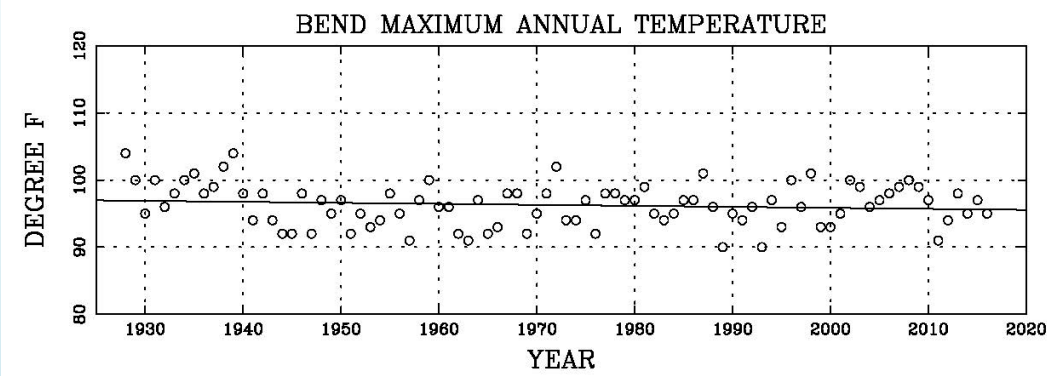
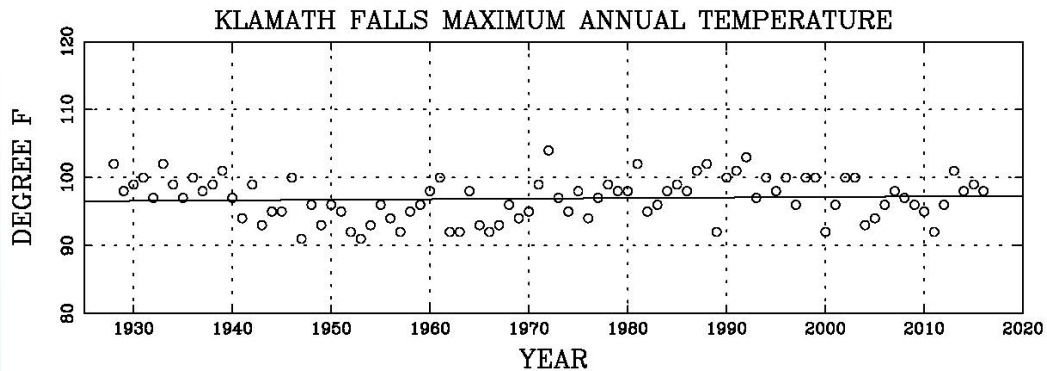
BEND AND MEDFORD ANNUAL AVERAGE TEMPERATURES



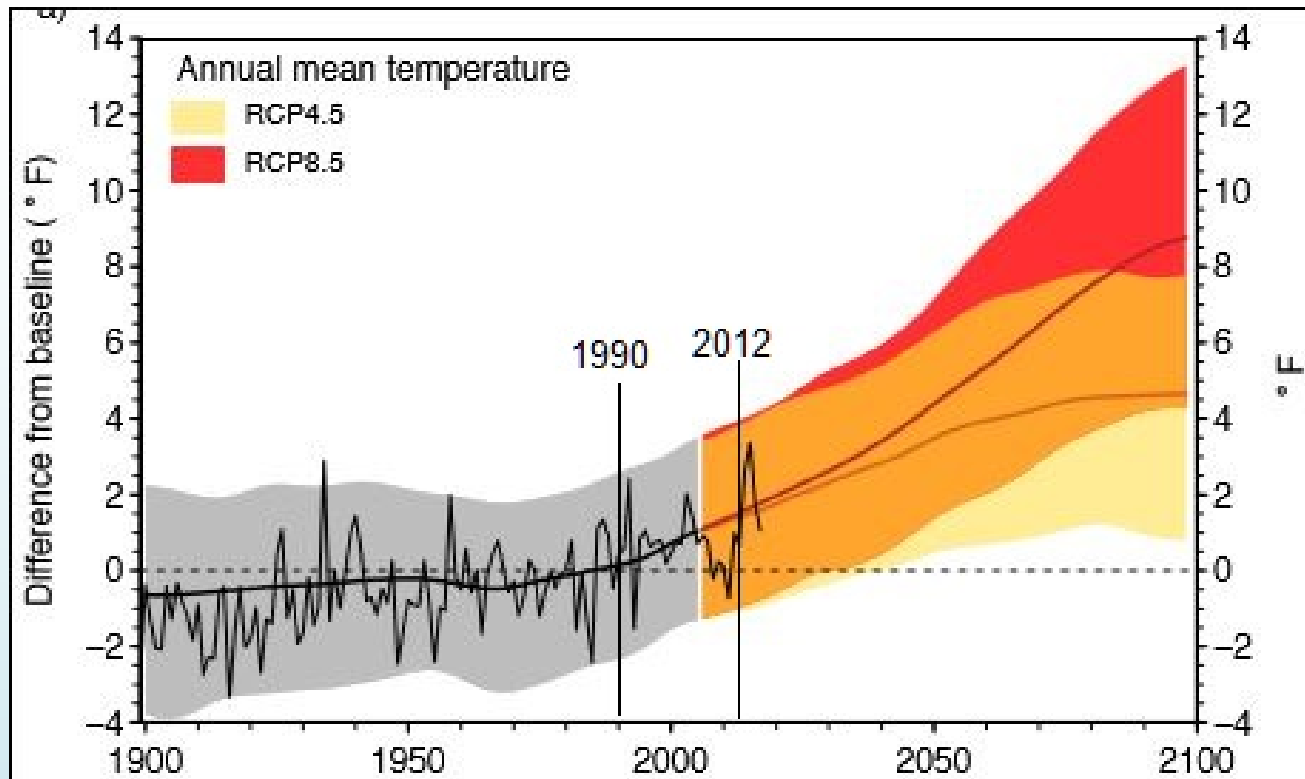
1951 AERIAL PHOTO SHOWING SOUTH END OF MEDFORD AIRPORT (UPPER LEFT). MOSTLY VACANT LAND AROUND THE AIRPORT. A 40 ACRE ORCHARD IS AT THE CENTER RIGHT (RED).



RECENT AERIAL PHOTO OF THE MEDFORD AIRPORT. MOST OF THE VACANT LAND AND THE ORCHARD HAS BEEN DEVELOPED, POSSIBLY CAUSING A URBAN HEAT ISLAND

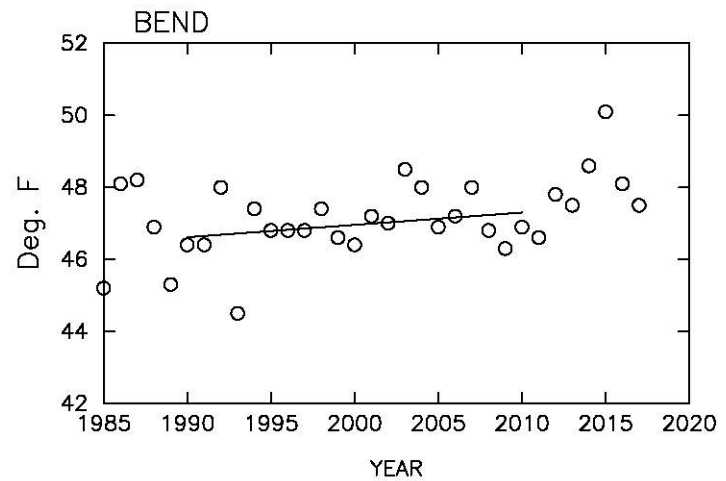
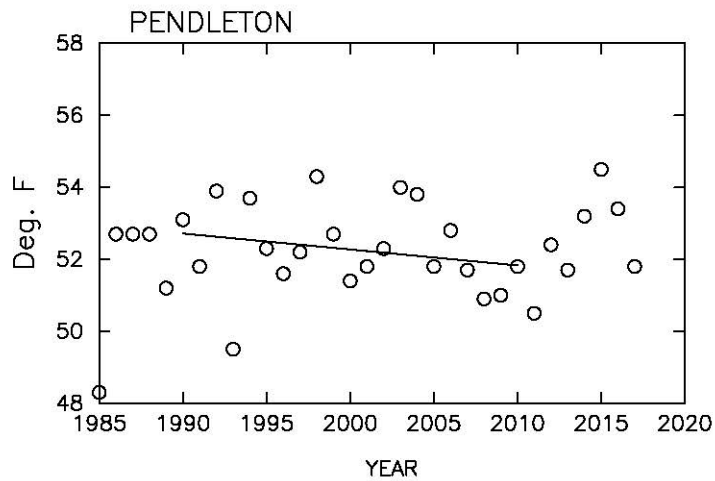
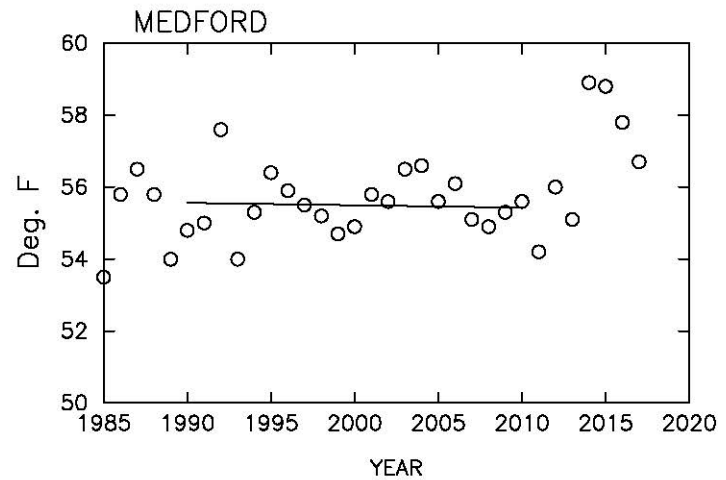
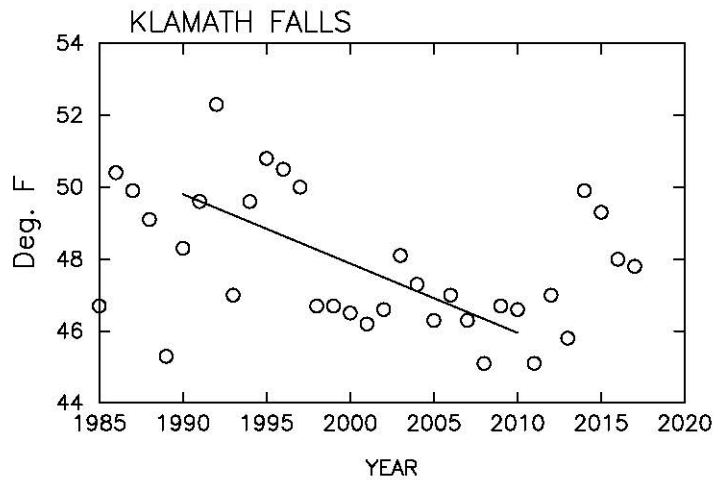


Maximum Annual Temperatures



**OREGON AVERAGE TEMPERATURE
MEASURED (BLACK) AND PREDICTED (COLORED)
SHOWS INCREASES OF 1.7 DEG. F FROM
1990 TO 2012 AND 9 DEG. F INCREASE BY 2100**

**The Fourth Oregon Climate Assessment Report (January 2019)
Oregon Climate Change Research Institute, OSU**



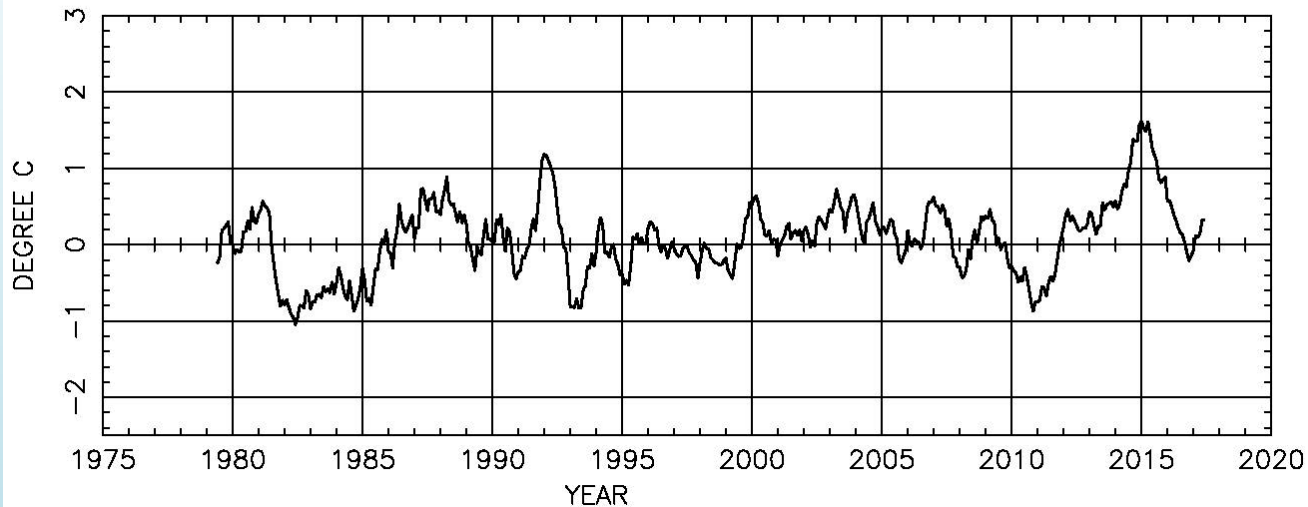
MEASURED DATA AT THE FOUR CITIES SHOWN WITH A TREND LINE FOR YEARS 1990 TO 2012



SATELLITE TEMPERATURE DATA FOR A ZONE COVERING OREGON AND THE SOUTHERN HALF OF WASHINGTON

Source: Earth System Science Center
University of Alabama - Huntsville

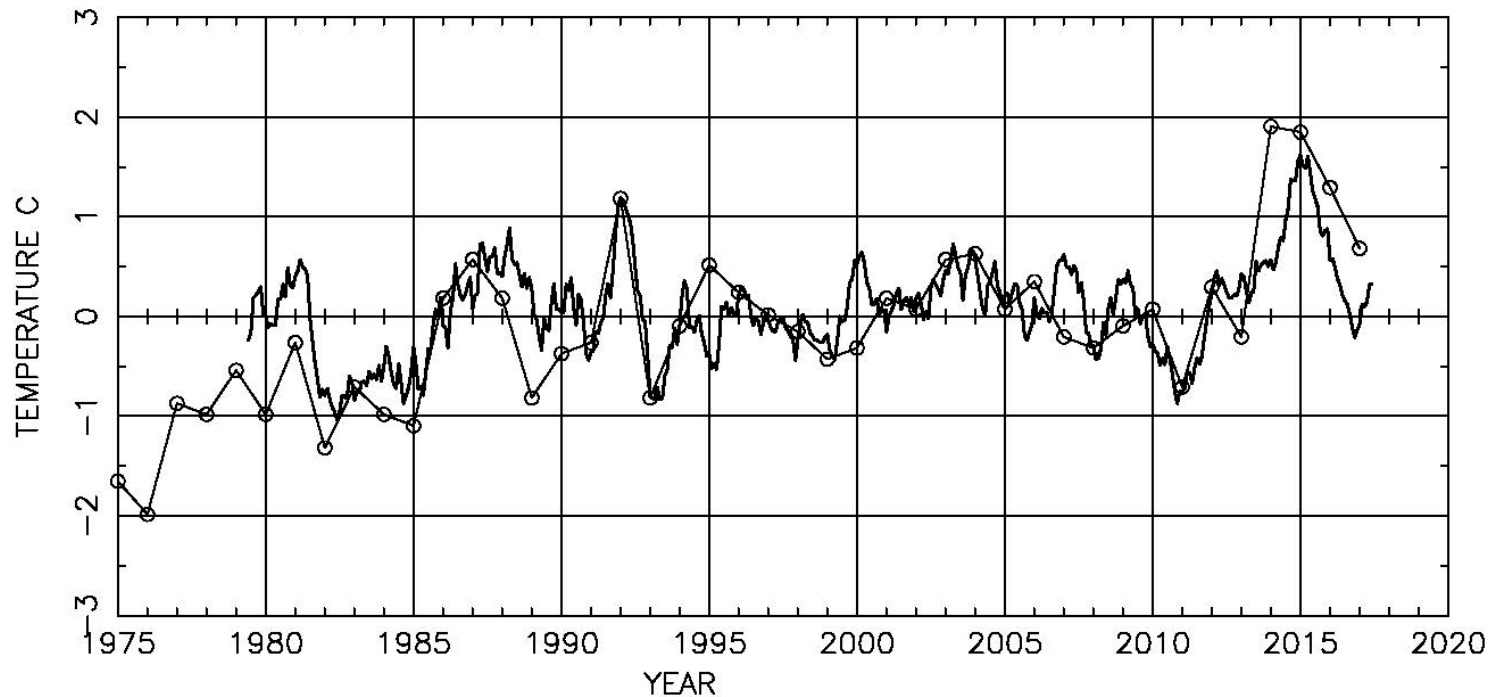
OREGON TEMPERATURE BY SATELLITE
RELATIVE TO 1981-2010 AVE



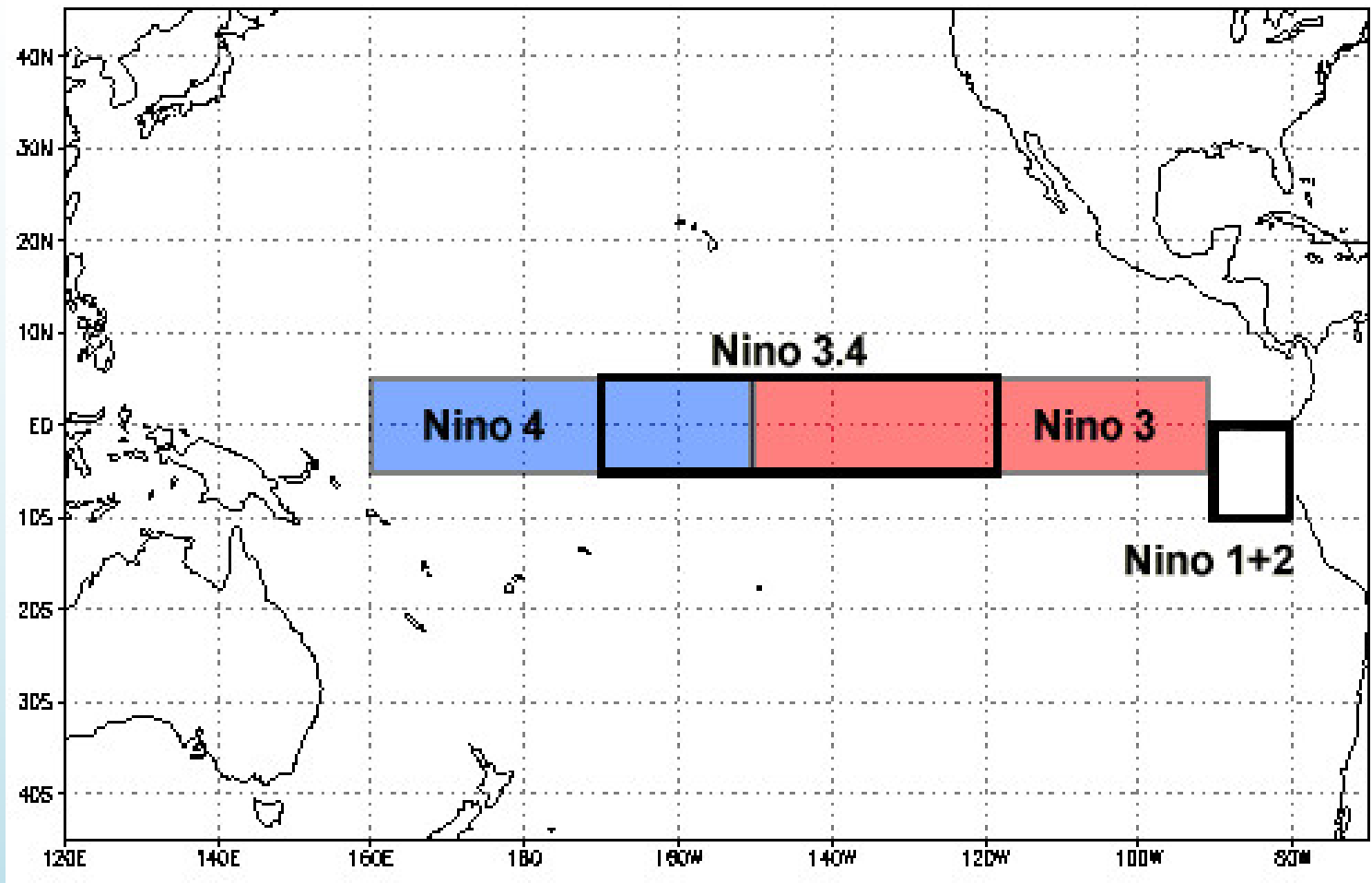
TEMPERATURES IN OREGON ARE STEADY.
THE 2014-2016 TEMPERATURE RISE IS DUE
TO AN EL NINO EVENT.
IT IS NOT DUE TO CO2.



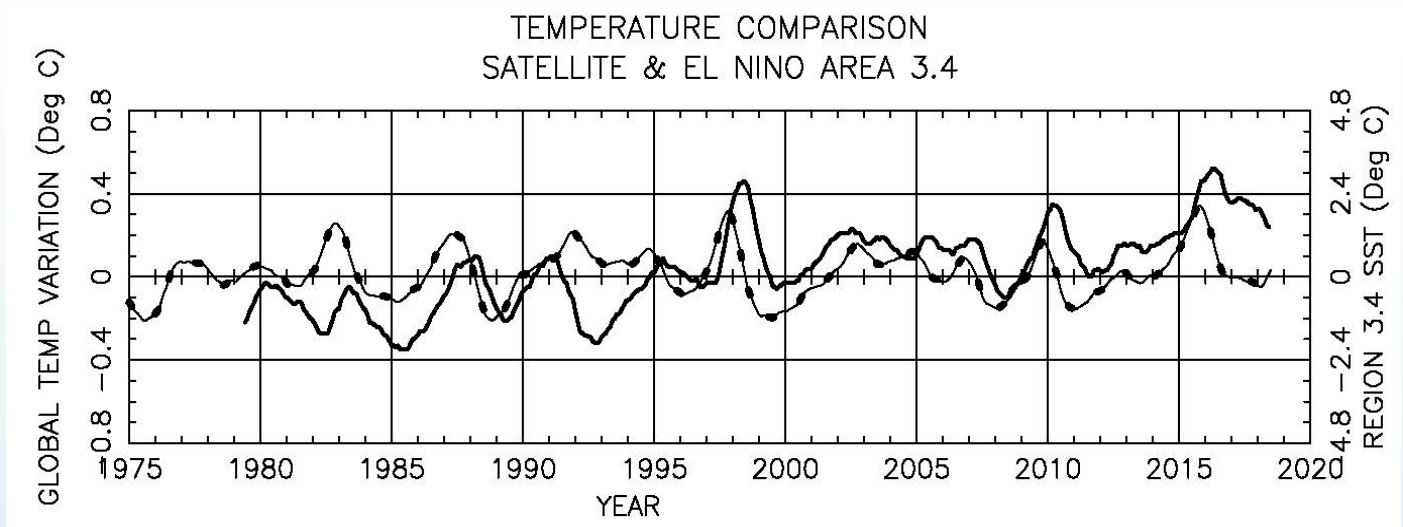
TEMPERATURE COMPARISON
SATELLITE vs CITY READINGS
CITY OF MEDFORD



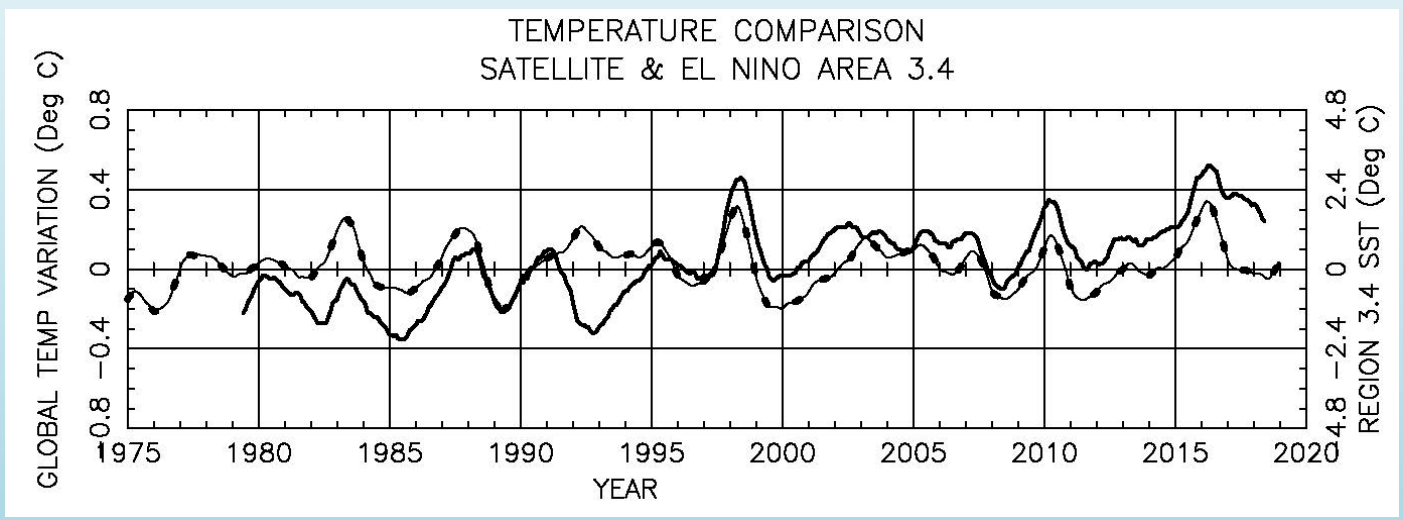
**MEDFORD AND SATELLITE TEMPERATURES AGREE,
PROVING SATELLITE DATA IS VALID AND
OREGON'S TEMPERATURE IS STABLE**



EL NINO PACIFIC AREA WHERE SEA SURFACE TEMPERATURES ARE OBSERVED



GLOBAL AIR TEMP. vs AREA 3.4 SEA TEMP.



GLOBAL AIR TEMP. vs AREA 3.4 SEA TEMP. (6 MONTH SHIFT)



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RESEARCH AREAS

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Beliefs about Global Climate Change (percent of US adults)

Due to Human Activity	48
Due to Natural Causes	31
No Evidence	20



Let's do something now to arrest climate change

Suzanne Butterfield **Bulletin** Guest column: (10/27/2018)

El Niño could bring warm, dry winter to Central Oregon Snowfall varies widely in El Niño years

Stephen Hamway, **Bulletin** (10/20/18)

Federal officials again target youths' climate case in Eugene

By Jack Moran **THE REGISTER-GUARD** (EUGENE) (10/8/18)

There's a link between acres burned and high temperatures

By Seth Borenstein, **THE ASSOCIATED PRESS** (8/19/18)

Higher temperatures mean hotter soil — and more carbon

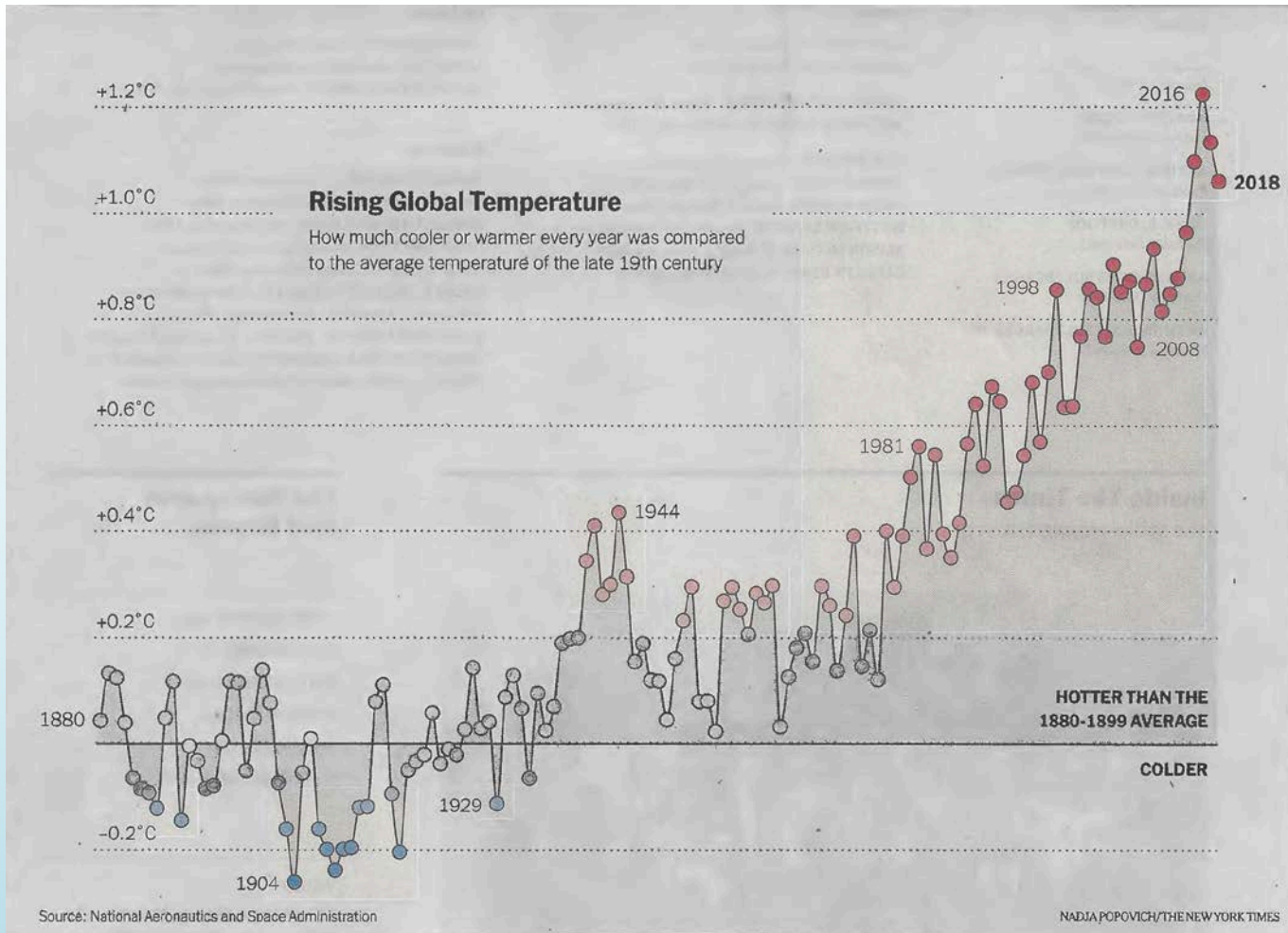
dioxide By Stuart Leavenworth, **MCCLATCHY WASHINGTON BUREAU** (8/1/18)

City Awarded Second Grant for Completion of Energy Planning Project.

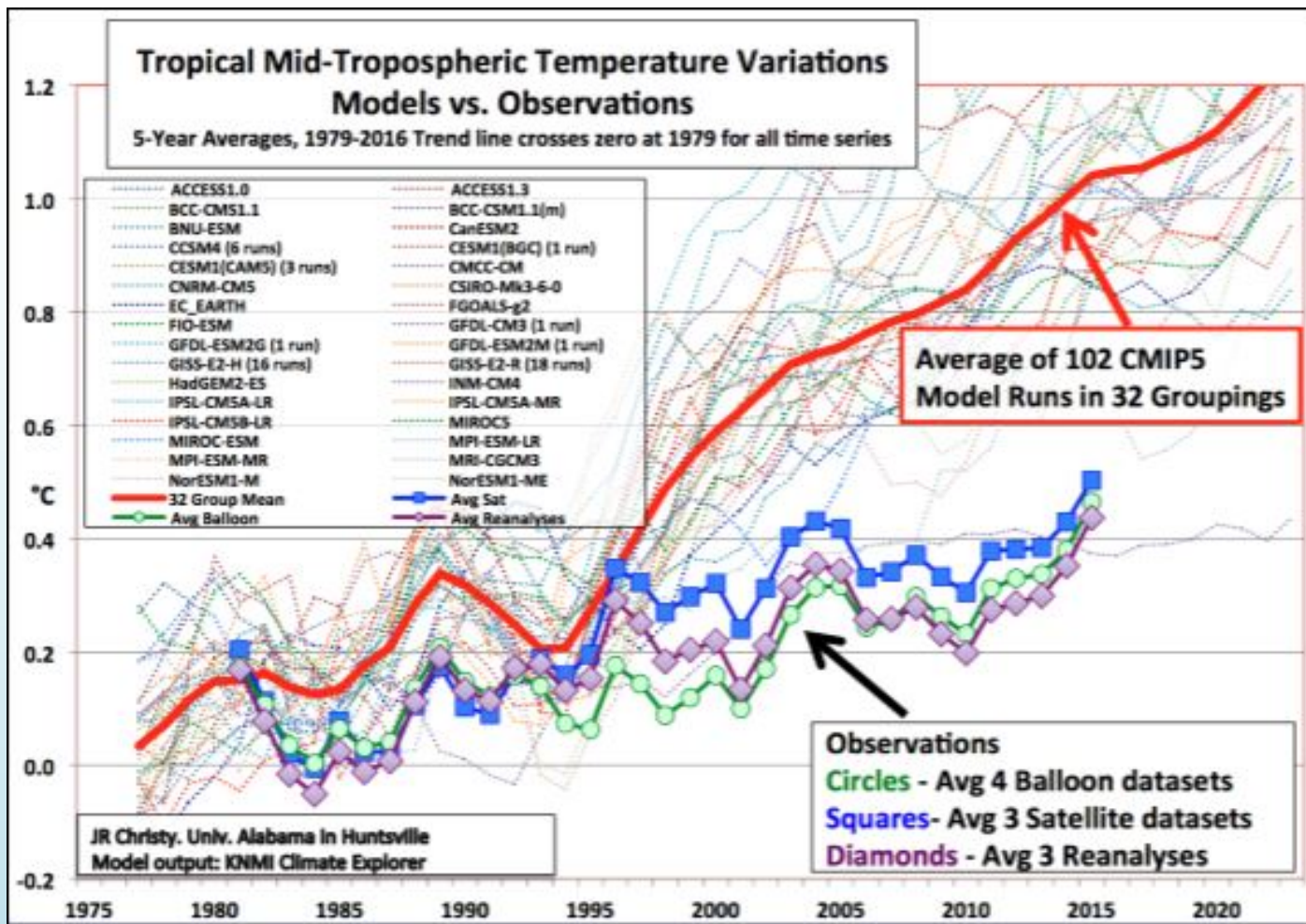
By City of Bend (11/9/18)

OSU Climate change Report a Mixed Bag for central Oregon

Forests. By Stephen Hamway (11/27/18)



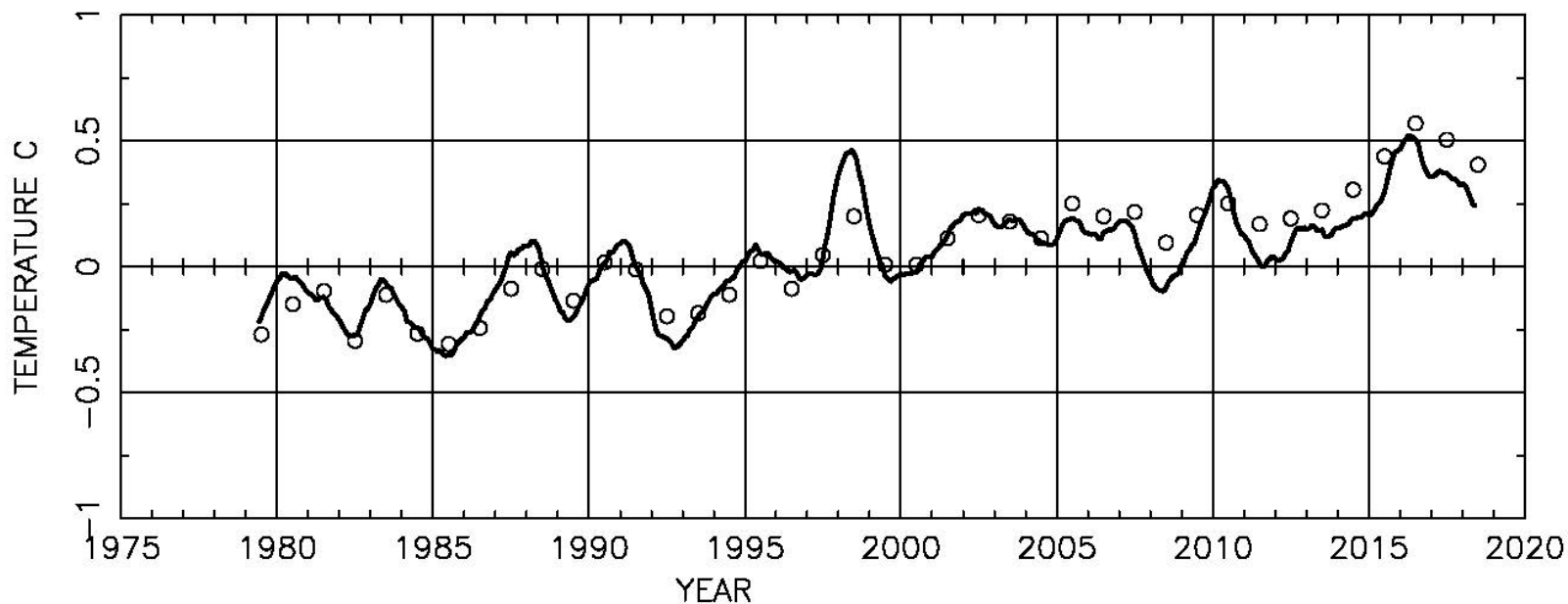
NEW YORK TIMES: Five Hottest Years Were 2014, 2015, 2016, 2017 And 2018.



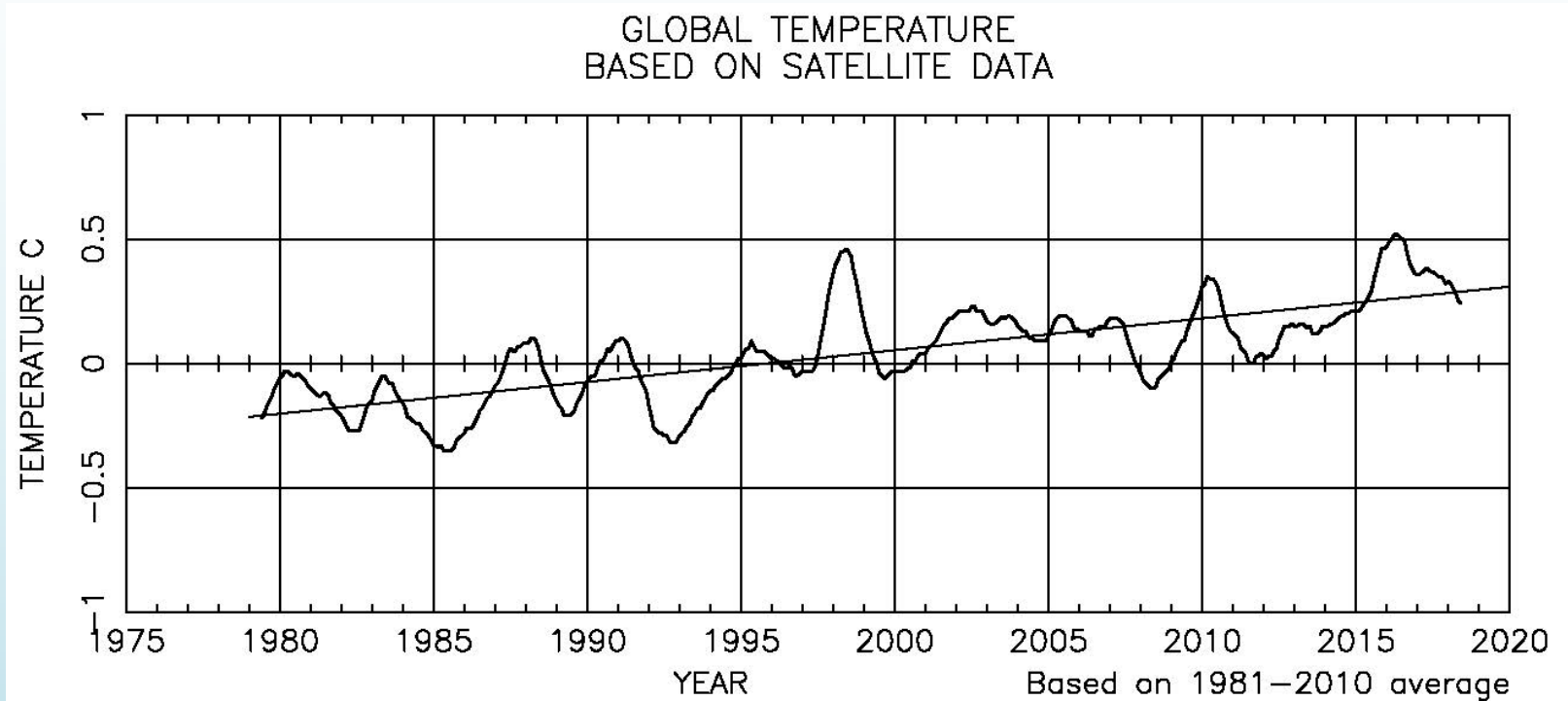
CMIP5 MODEL AVERAGE RISES 2.7 DEG. C IN 100 YEARS.
SATELLITE DATA INDICATES A 1.3 DEG. C RISE IN 100 YEARS



GLOBAL TEMPERATURE COMPARISON SATELLITE (line) vs NASA (circles)



**SATELLITE DATA SHOWS FIVE HOTTEST YEARS
WERE 2016, 1998, 2017, 2010 and 2015.**



**SATELLITE DATA: GLOBAL TEMPERATURE
INCREASES ABOUT 1.28 DEG. C IN 100 YEARS**



Atmospheric CO2 Concentration Is Increasing.

Global Climate Models Predict Rising Temperatures.

Oregon Temperatures May Be Up 9 Degrees By 2100.

US President Withdraws From Paris Climate Accord.

Oregon Officials Decide Something Must Be Done.

- Legislature Proposes Cap and Trade to Reduce Emissions to 25% Below 1990 Levels By 2025 (*In 2016, Emissions Were 10% Higher Than The 1990 Level*).
- Bend's Climate Action Proposal: A 40% Reduction In Fossil Fuel Use By 2030.



Oregon Temperature Summary

- Since 1928 annual average temperature trend is down for Pendleton and Klamath Falls, Bend shows a slight increase.
- Medford temperature increase is likely due to heat island effect.
- Between 1990 and 2012 average temperatures either decline or were unchanged at the four cities - **this conflicts with OSU prediction of a 1.7 deg. F increase.**
- Satellite temperature measurements for Oregon show little change since 1980 (and confirms Medford data).



Global Temperature Summary

Satellite: Global Temperature increases 0.0128 Degrees C per year (1.3 deg. C in 100 years).

IPCC: Models overpredict satellite temperatures by a factor of 2. (0.013 v 0.027 Deg. C per year).

Pacific Ocean Sea Surface Temperatures have strong effect on global air temperature.



Biennial Report to the Legislature
Oregon Global Warming Commission, February 2017

Oregon remains unprepared for the health, flooding, drought, fire and ecosystem damages that climate change is likely to bring.

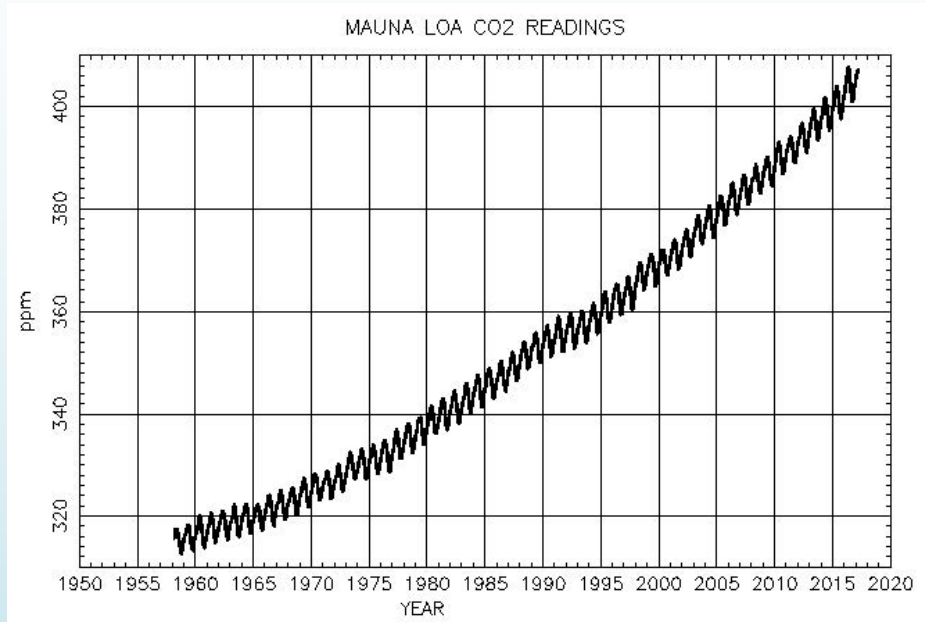
**Legislature's Corrective Action:
IMPOSE CAP and TRADE**

Reduce GHG emissions below 1990 levels
20% by 2025
45% by 2035
80% by 2050

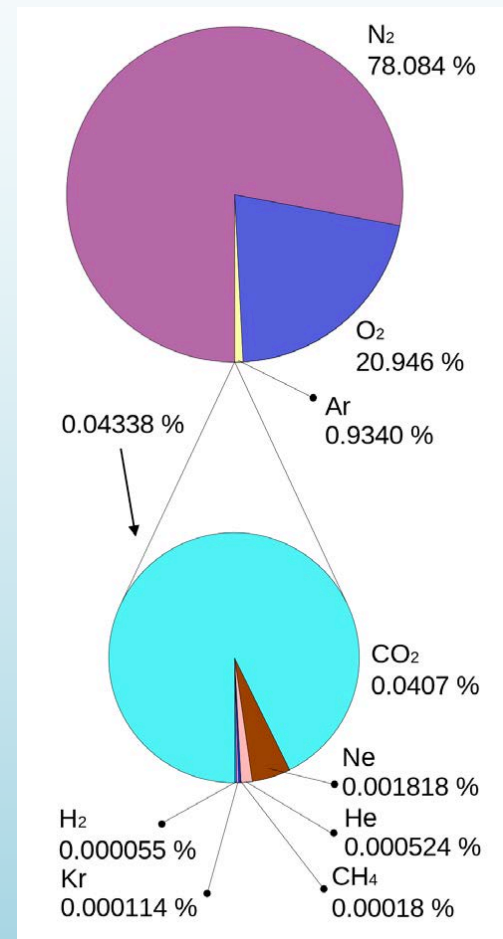
Costing \$700 million first year
Increasing in subsequent years.



ATMOSPHERIC CONSTITUENT GASES



ATMOSPHERIC CO2
CONTENT RECORDED AT
MAUNA LOA, HAWAII

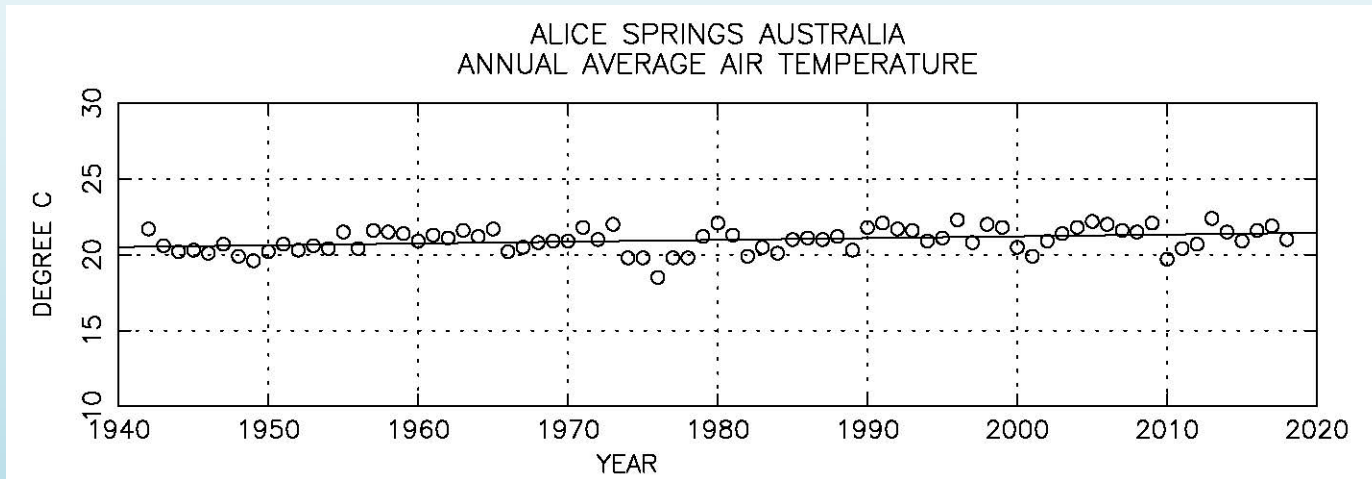


OREGON REVISED STATUTE

SECTION 37. ORS 468A.210 is amended to read:

[(1)] “global warming” means an increase in the average temperature of the earth’s atmosphere that is associated with the release of greenhouse gases.

WHAT IF GREENHOUSE GASES ARE NOT A PRIMARY CAUSE OF GLOBAL WARMING?



Remote Town in Australia seems unaffected by the 32% increase in CO₂ since 1960



OREGON LEGISLATURE RELIES ON IPCC AND OSU
REPORTS TO JUSTIFY A CAP AND TRADE REGIME
BEND IS DEVELOPING A CLIMATE ACTION PROGRAM.

These efforts:

- are based on modeling data that is refuted by satellite and field data,
- would economically damage the state, city and especially those citizens of limited means.
- would have little effect on global warming.



On True Believers

IT'S ALMOST IMPOSSIBLE, EVEN WITH DATA, TO CONVINCING A BELIEVER THAT HIS/HER CORE BELIEF MAY BE WRONG.

THESE FOLKS HAVE SO MUCH VESTED INTEREST IN THEIR BELIEF SYSTEM THAT EVIDENCE SUCH AS THESE DATA WILL BE ATTACKED, NOT CONSIDERED.

Dr. John Christy, Director, Earth System Science Center
University of Alabama - Huntsville