

## Making Climate Change Real...

7/14/2011

Hi Everyone,

So there was a lot of positive feedback regarding the last blog post on “Climate cycles & climate trends & weird weather”, so I thought I’d extend the digression away from the stream temperature discussion one more time. In looking back on it, I now realize I probably should have set the context for this blog at the outset with today’s subject matter and that of the previous one, but I never claimed to be a linear thinker. Moreover, the nice thing about this blog format is that the feedback received on various posts gives me a good sense of where people’s thinking is at across a diverse geographic & disciplinary spectrum & helps me tailor subsequent blog posts in a way that is most useful (hopefully) on the whole.

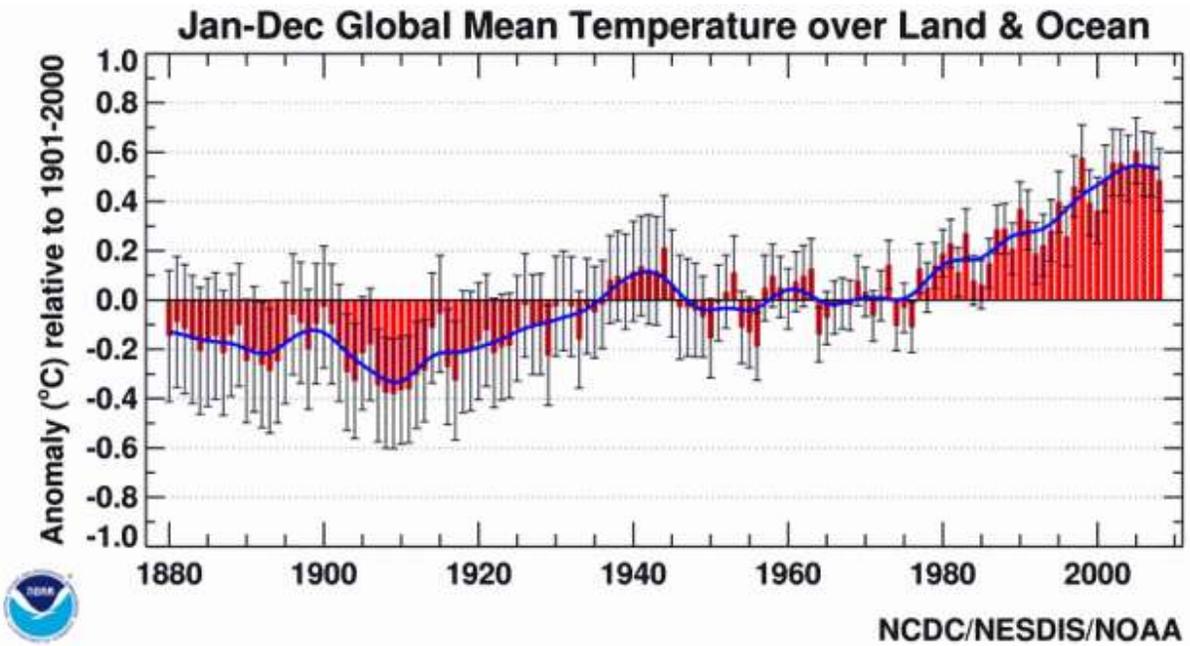
So this time out, I thought I’d highlight a few of the tools that are available for visualizing observed, historical trends related to climate change. The basic graphs of trends in global average temperatures (graphic 1) that we’re all used to seeing are the most general of generalizations that mask a lot of local variability, so seeing how this global phenomenon has been playing out locally puts a face on it & may make it seem more real.

The first tool is one developed by the Office of the Washington State Climatologist & is simply a GoogleMap that provides a dynamic means of summarizing historical air temperature and precipitation trends at weather stations across the Pacific Northwest over the last century (graphic 2). It’s easy & intuitive to use, & remember, it’s based on observed data, not model scenarios about possible futures. I use it all the time to visualize & think about how warming trends vary relative to the time-period and season considered.

The second tool is the Climate Wizard developed by the Nature Conservancy & a consortium of partners. It’s more general in geographic scope and provides a means of viewing historical temperature & precipitation trends for individual states, the entire U.S., or globally (graphic 3). The Climate Wizard isn’t as customizable as the GoogleMap tool in its capacity to examine different historical time periods or seasons, but does provide spatially continuous maps of temperature changes based on interpolations between historical observations. The Climate Wizard tool also provides functionalities for visualizing future climate scenarios, though with less spatial resolution than the historical record. The attached paper by Girvetz et al. 2009 describes this tool & it’s potential uses in detail.

So these are a few of the climate visualization tools that exist & there are probably many others I don’t know about (I’d be happy to hear about your favorites & maybe we compile a list that gets posted to the blog?). In a way, it all seems pretty straightforward & you almost wonder what all the hullabaloo is about. I mean, it’s just air temperatures gradually warming and precipitation regimes changing ever so slightly over the course of our lifetimes, right? But those two factors & their interaction trigger a profound set of consequences in terms how water is delivered to streams and lakes, it’s thermal properties when in those systems, the types of vegetation that grow near aquatic systems, perhaps even the yield of nutrients from the terrestrial to the aquatic realm, all of which have great importance from a fish’s perspective & which we need to better understand in the next few years.

Until next time, best regards,  
Dan



# Climate Tool for the Pacific Northwest



OWSC  
Office of the Washington State Climatologist

N.W. Temperature, Precipitation, & SWE Trend Analysis  
Mean Temperature Trend Analysis 1895-2010

Data Type: Mean Temperature  
Year: Start: 1895 End: 2010  
Period: Annual

Graph Options:  
 Std. Deviation     Size: 400x354  
 State Average\*     Size: 600x440  
 Trend Line

\*State mean temperature (not max. or min.) and precipitation only. Not available for Canada.

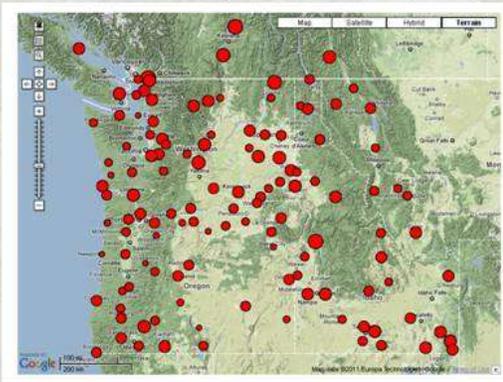
Refresh Map

Customizable Queries

Mean **Summer** Air Temp Trends (1980 - 2010)



Mean **Annual** Air Temp Trends (1950 - 2010)

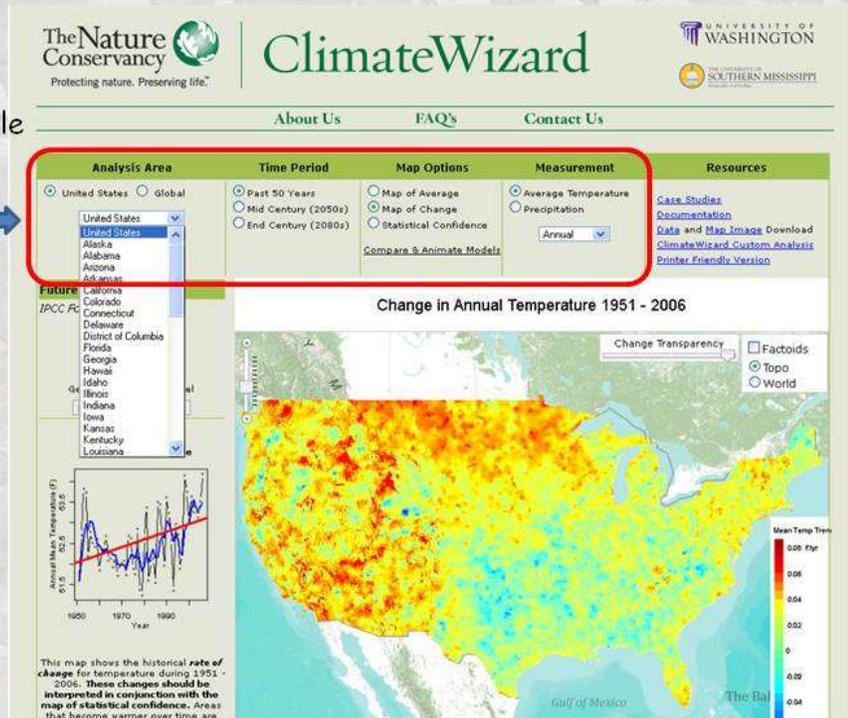


<http://www.climate.washington.edu/trendanalysis/>

# Climate Tool for the U.S. & Globe



Customizable  
Queries



<http://www.climatewizard.org/>

Girvetz et al. 2009. Applied Climate-Change Analysis: The Climate Wizard Tool. PLoS ONE 4(12): e8320. doi:10.1371/journal.pone.0008320

To discuss this topic more fully or to see earlier posts, please go to the **Climate-Aquatics Discussion Group Blog** at this link: <http://groups.google.com/group/climateaquaticsblog?hl=en>

## Previous Posts

### **Climate-Aquatics Overviews**

Blog #1: [Climate-aquatics workshop science presentations available online](#)

Blog #2: [A new climate-aquatics synthesis report](#)

### **Climate-Aquatics Thermal Module**

Blog #3: [Underwater epoxy technique for full-year stream temperature monitoring](#)

Blog #4: [A Google map tool for interagency coordination of regional stream temperature monitoring](#)

Blog #5: [Massive air & stream sensor networks for ecologically relevant climate downscaling](#)

Blog #6: [Thoughts on monitoring air temperatures in complex, forested terrain](#)

Blog #7: [Accurate downscaling of climate effects on river network temperatures through use of inter-agency temperature databases and application of new spatial statistical stream models](#)

Blog #8: [Thoughts on monitoring designs for temperature sensor networks across river and stream basins](#)

Blog #9: [Assessing climate sensitivity of aquatic habitats by direct measurement of stream & air temperatures](#)

Blog #10: [Long-term monitoring shows climate change effects on river & stream temperatures](#)

Blog #11: [Long-term monitoring shows climate change effects on lake temperatures](#)

Blog #12: [Climate trends & climate climate cycles & weather weirdness](#)

### **Future topics...**

**Climate-Aquatics Hydrology Module**

**Climate-Aquatics Biology Module**

**Climate-Aquatics Management Module**

**Instructions for joining the group discussion:** After clicking on the link, you should be able to see the discussion thread text, but to post comments & read those of others you'll first have to join the Climate-Aquatics Group (you'll only have to do this the first time). To join, follow these steps: 1) on the right side of the page, click on "Join this group" 2) Create your account information with Google user name & password, 3) Add your "nickname", 4) Pick one of the four available options for how you'll read this group (I'd advise against the bottom one that sends a new email every time a comment is added to a discussion thread), 5) Select "Join this group" at the bottom of the page, and 6) Click on the discussion topic hyperlink and you should now be able to post comments to the discussion thread.

The intent of the discussion group is to provide a means for the 1,900 (& growing) field biologists, hydrologists, students, managers, and researchers currently on this mailing list across North America, Europe, and Asia to more broadly and rapidly discuss topical issues associated with aquatic ecosystems and climate change. Messages periodically posted to this blog will highlight new peer-reviewed research and science tools that may be useful in addressing this global phenomenon. Admittedly, many of the ideas for future postings have their roots in studies I and my colleagues have been a part of in the Rocky Mountain region, but attempts will be made to present topics & tools in ways that highlight their broader, global relevance. Moreover, I acknowledge that the studies, tools, and techniques highlighted in future missives are by no means the only, or perhaps even the best, science products in existence on particular topics, so the hope is that this discussion group engages others doing, or interested in, similar work and that healthy debates & information exchanges will occur to facilitate the rapid dissemination of knowledge among those most passionate about climate change and its effects on aquatic ecosystems.

If you know of others interested in climate change and aquatic ecosystems, please forward this message and their names can be added to the mailing list for notification regarding additional science products on this topic. If you do not want to be contacted regarding future such notifications, please reply to that effect and you will be removed from this mailing list.