Choctawhatchee River Tree Ring Study

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Outline

- Acknowledgments
  - Pat O'Neil and Nick Tew
- 2014 Orange Beach Refresher
- Development of Webpage
  - http://choctawhatcheerivertreeringstudy.weebly.com/
- Results
- Future Work
- Questions

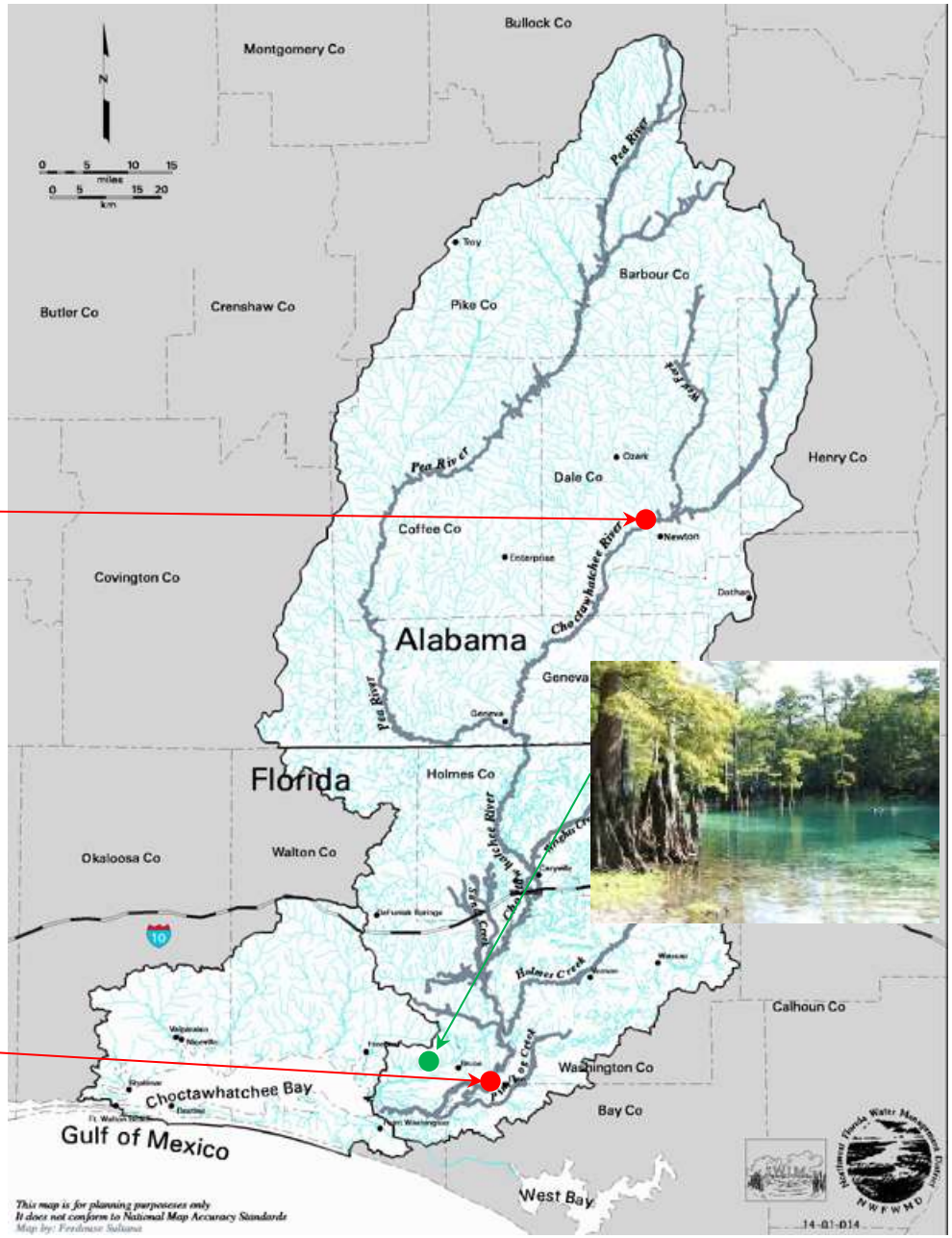
Choctawhatchee River Water-Year Droughts

Newton AL

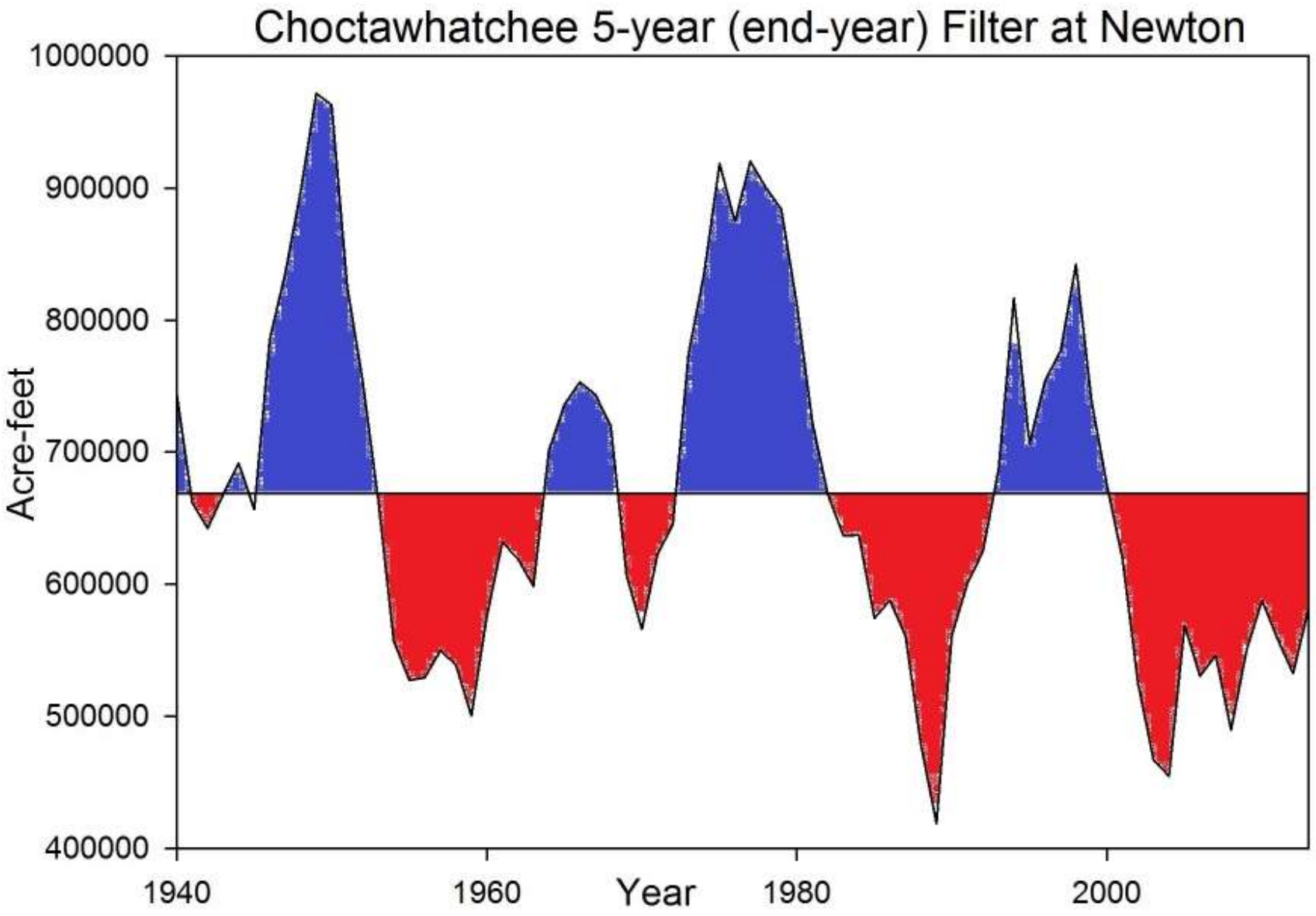
	Water-Year (1936 to 2013)		
Rank	1-year	5-year (end year)	10-year (end year)
1	**2012**	1989	**2008**
2	**2000**	**2004**	**2009**
3	**2011**	**2003**	1989
4	**2002**	1988	1959
5	1955	**2008**	**2007**
6	**2007**	1959	**2013**
7	1981	**2002**	**2012**
8	1951	1955	**2011**
9	1956	1956	1960
10	**2006**	**2006**	1988

Bruce FL

	Water-Year (1931 to 2013 - missing 1983 & 1984)		
Rank	1-year	5-year (end year)	10-year (end year)
1	**2011**	1956	**2008**
2	**2000**	1955	1959
3	**2002**	**2004**	**2009**
4	**2012**	1957	1960
5	**2007**	1959	**2007**
6	1956	**2008**	**2013**
7	1955	1958	**2011**
8	**2006**	**2003**	**2012**
9	1951	1954	1958
10	1981	1989	1961



Choctawhatchee River Water-Year Streamflow



NOAA NATIONAL CLIMATIC DATA CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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2. **Stahle - Choctawhatchee River - TADI - FL001, PAGES North America 2K Version**
Stahle, D.W.; Cleaveland, M.K. *Earliest Year:* 750 cal yr BP (1200 AD) * *Most Recent Year:* -37 cal yr BP (1987 AD) * *Location Bounds - North:* 30.45 * *South:* 30.45 * *East:* -85.92 * *West:* -85.92 *
Tree ring data from the International Tree Ring Data Bank and World Data Center for Paleoclimatology archives. Most data sets include raw treering measurements (most are annual ring width, with some collections of earlywood or latewood width or wood density), plus chronologies (standardized growth indices for a site compiled from multiple treering samples). Reconstructions of climate variables are included with some of these data sets. Each data type is stored in a separate data file; the data type is coded into the file name. For details please see: http://www.ncdc.noaa.gov/paleo/treeinfo.htmll...

3. **Stahle - Choctawhatchee River - TADI - ITRDB FL001**
Stahle, D.W.;Cleaveland, M.K. *Earliest Year:* 1051 cal yr BP (899 AD) * *Most Recent Year:* -42 cal yr BP (1992 AD) * *Location Bounds - North:* 30.45 * *South:* 30.45 * *East:* -85.92 * *West:* -85.92 *
Tree ring data from the International Tree Ring Data Bank and World Data Center for Paleoclimatology archives. Data include raw treering measurements (most are annual ring width, with some collections of earlywood or latewood width or wood density), plus chronologies (standardized growth indices for a site compiled from multiple treering samples). Each data type is stored in a separate data file; the data type is coded into the file name. For details please see: http://www.ncdc.noaa.gov/paleo/treeinfo.html...

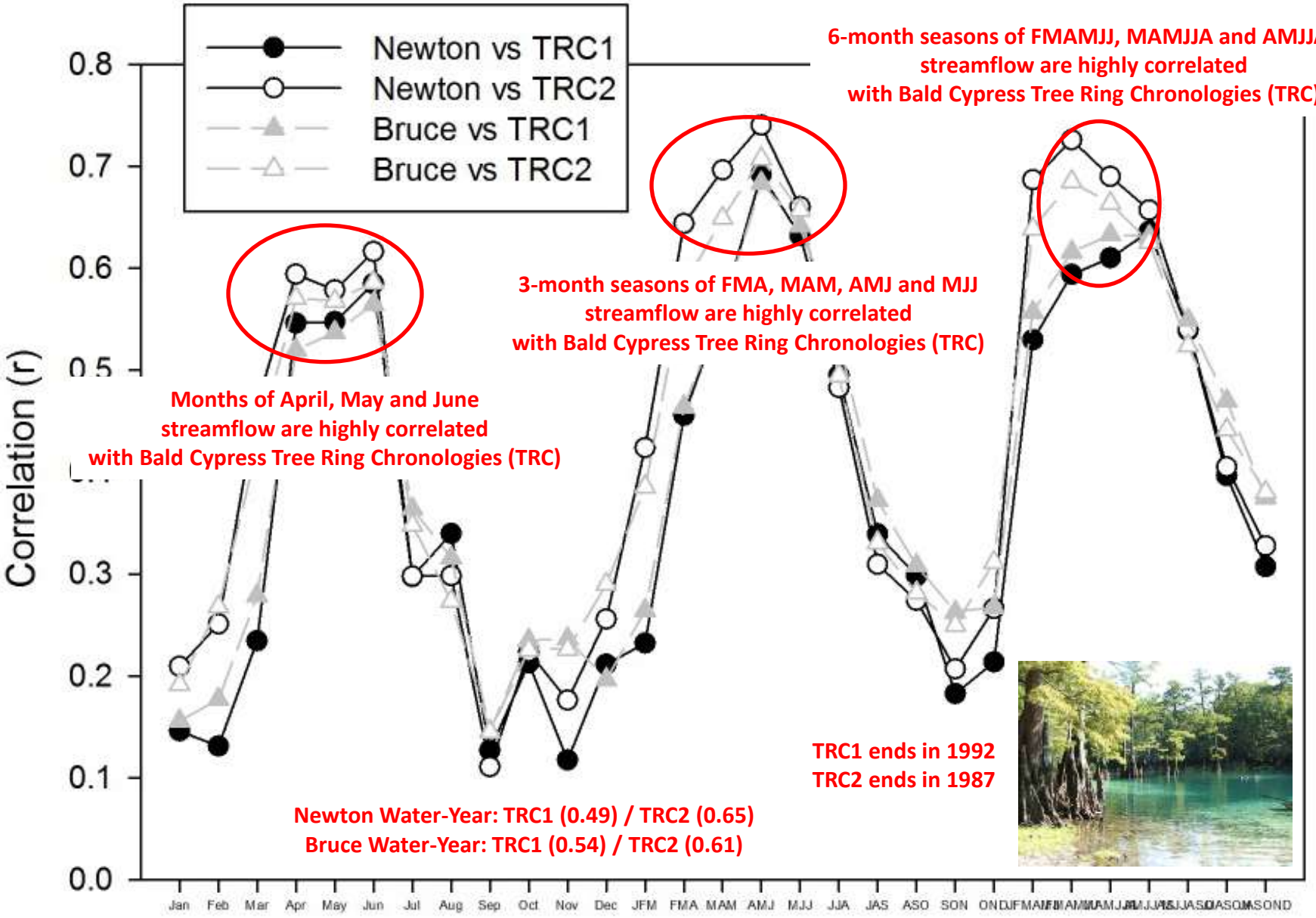
Datasets
- Borehole
- Climate Forcing
- Climate Reconstruction
- Coral and Sclerosponge

NCDC's Paleoclimatology Branch and the World Data Center for Paleoclimatology. The ITRDB includes raw ring width, wood density, isotope measurements, and site growth index chronologies. Over 3,000 sites on six continents are included. Reconstructed climate parameters are also available for some areas.

Obtaining Data at the World Data Center

Search Datasets

Choctawhatchee River Reconstruction Potential



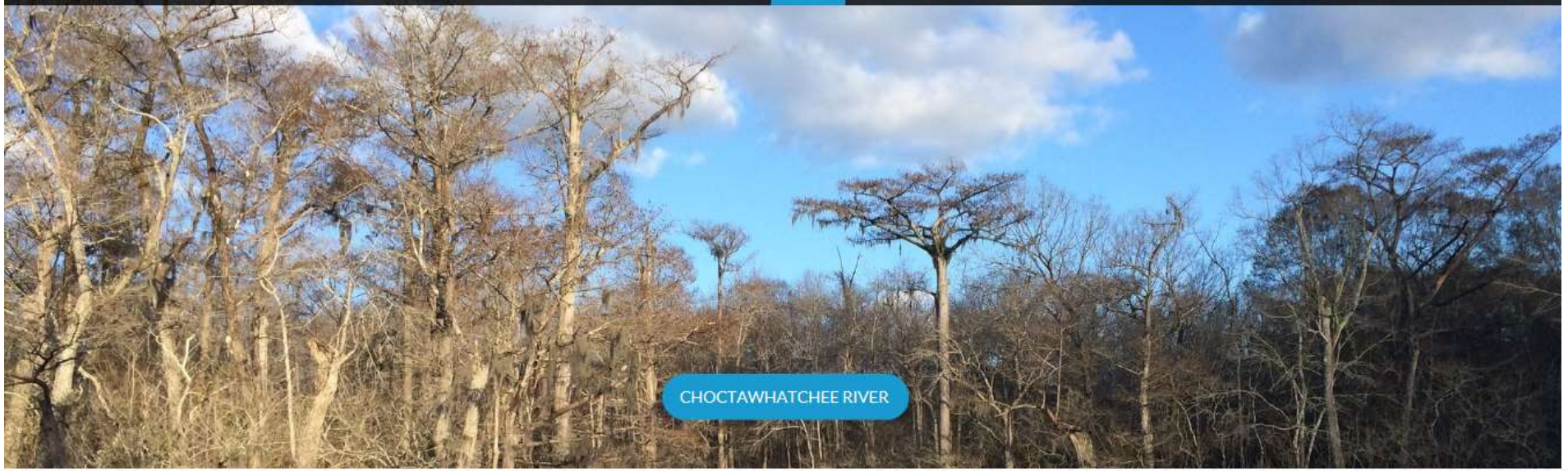
6-month seasons of FMAMJJ, MAMJJA and AMJJAS streamflow are highly correlated with Bald Cypress Tree Ring Chronologies (TRC)

3-month seasons of FMA, MAM, AMJ and MJJ streamflow are highly correlated with Bald Cypress Tree Ring Chronologies (TRC)

Months of April, May and June streamflow are highly correlated with Bald Cypress Tree Ring Chronologies (TRC)

TRC1 ends in 1992
TRC2 ends in 1987

Newton Water-Year: TRC1 (0.49) / TRC2 (0.65)
Bruce Water-Year: TRC1 (0.54) / TRC2 (0.61)



ABOUT THE STUDY

Dr. Matt Therrell (UA Department of Geography) and Dr. Glenn Tootle (UA Department of Civil, Construction and Environmental Engineering) and a team of two graduate (Ashton Greer and Matt Meko) and seven undergraduate (Siera Jann, Caitlin Koranda, Natalie Leder, Aubrey Loria, Mallory Mitchell, Thomas Moat, Sam Spector) researchers traveled from The University of Alabama to the Choctawhatchee River in the Florida panhandle to collect tree ring data from Bald Cypress trees in order to conduct research on reconstructing streamflow. The study is funded by the Geological Survey of Alabama and the Mississippi-Alabama Sea Grant Consortium.

Special thanks to Mr. Bruner for access to the tree sampling sites and to the Geological Survey of Alabama and the Mississippi-Alabama Sea Grant Consortium for their support.

GEOLOGICAL SURVEY OF ALABAMA
Founded 1848

Sea Grant
Mississippi-Alabama

http://choctawhatcheerivertreeringstudy.weebly.com/

LOCATION

The work site was on the Choctawhatchee River by Cowford Island in Northwest Florida.


patagonia
University Of Alabama

Tree ring records have been cross-dated to provide to date historic events

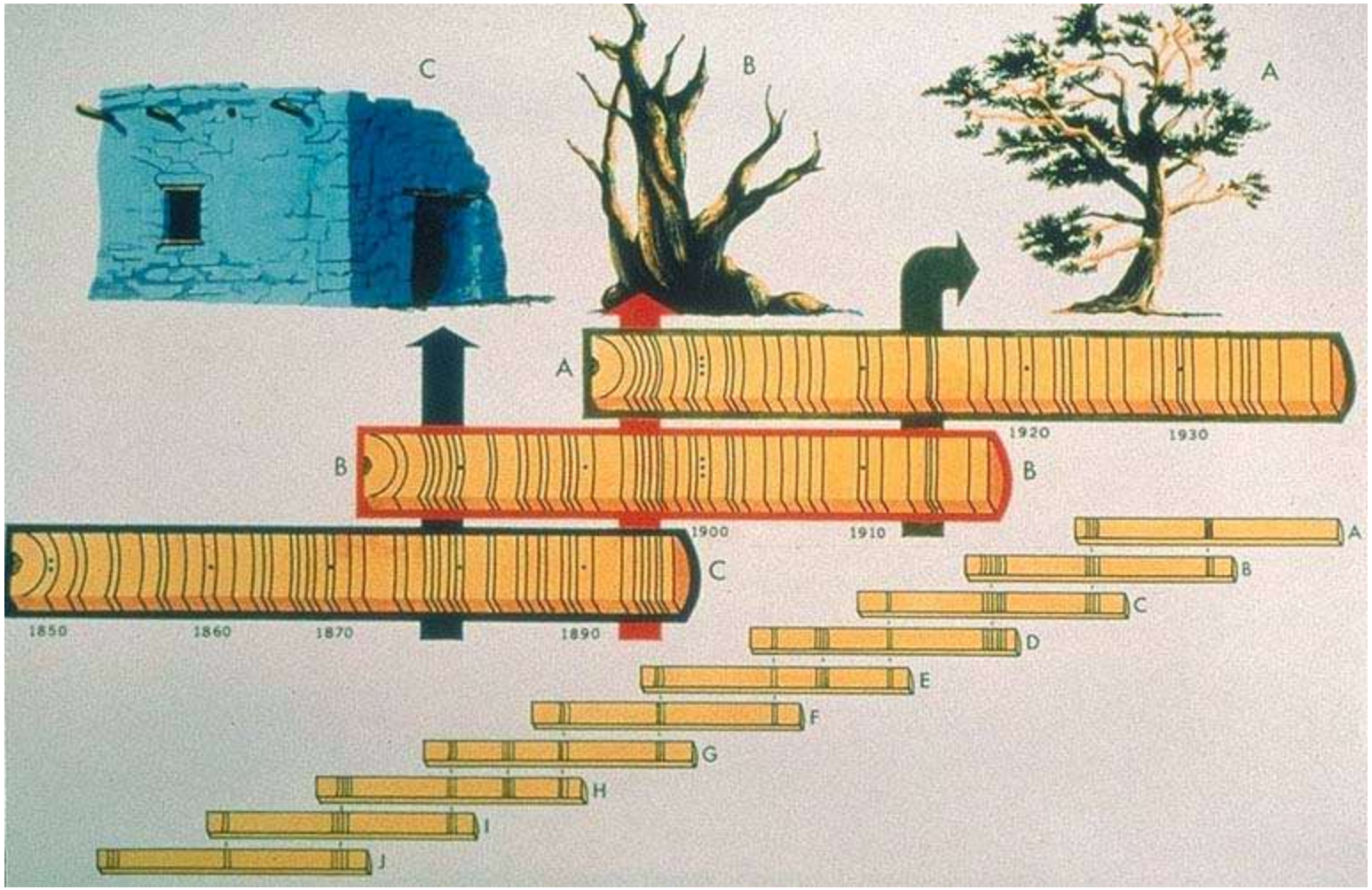
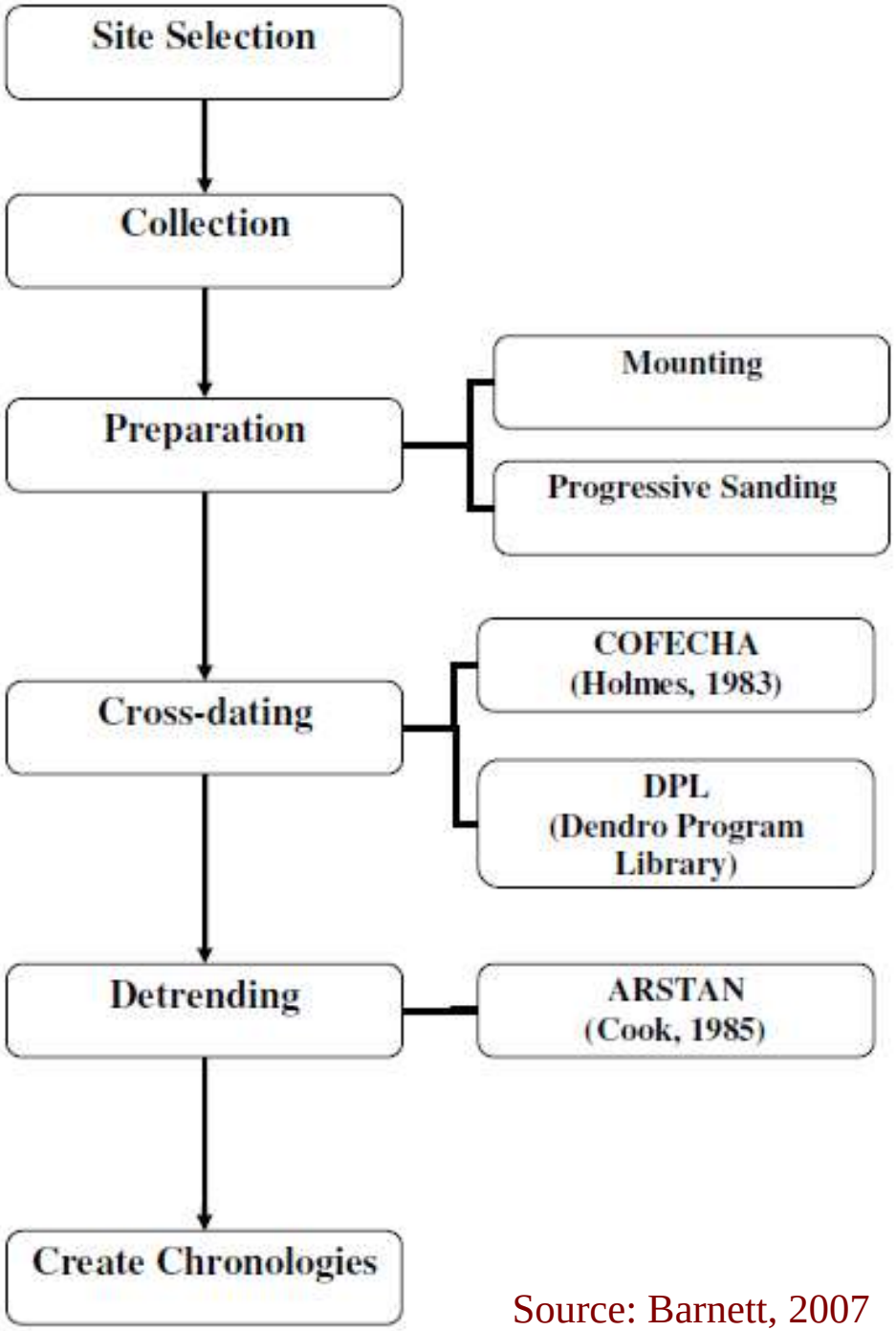


Image courtesy of LTRR (U. AZ)

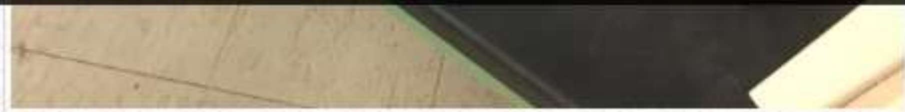


Source: Barnett, 2007

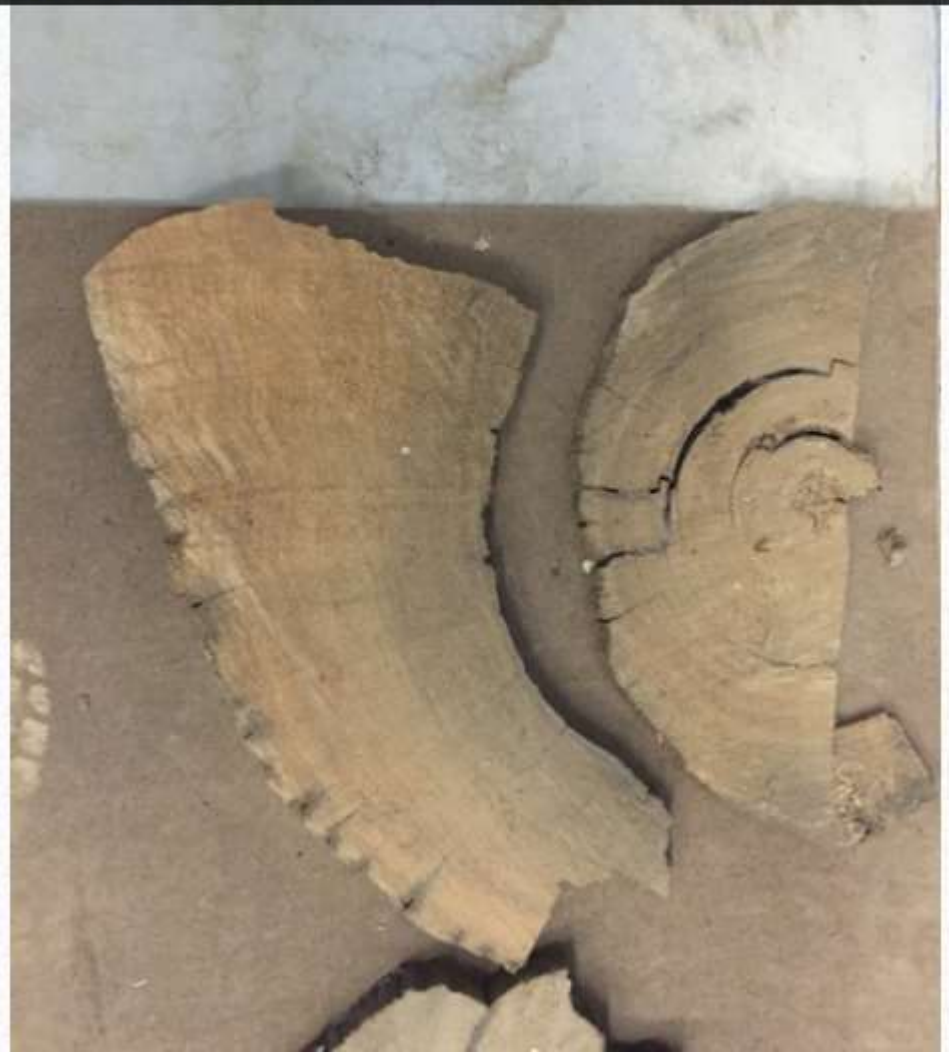
DR. MATT THERRELL'S TREE RING LABORATORY:

Tree ring samples (cores) from live Bald Cypress trees are mounted, sanded and the ring widths are measured in the lab. Dead wood samples are measured and cross-dated.

CHOCTAWHATCHEE RIVER TREE RING STUDY



CHOCTAWHATCHEE RIVER TREE RING STUDY



CHOCTAWHATCHEE RIVER TREE RING STUDY

Many samples from a site are detrended and combined to create a single time series (chronology)

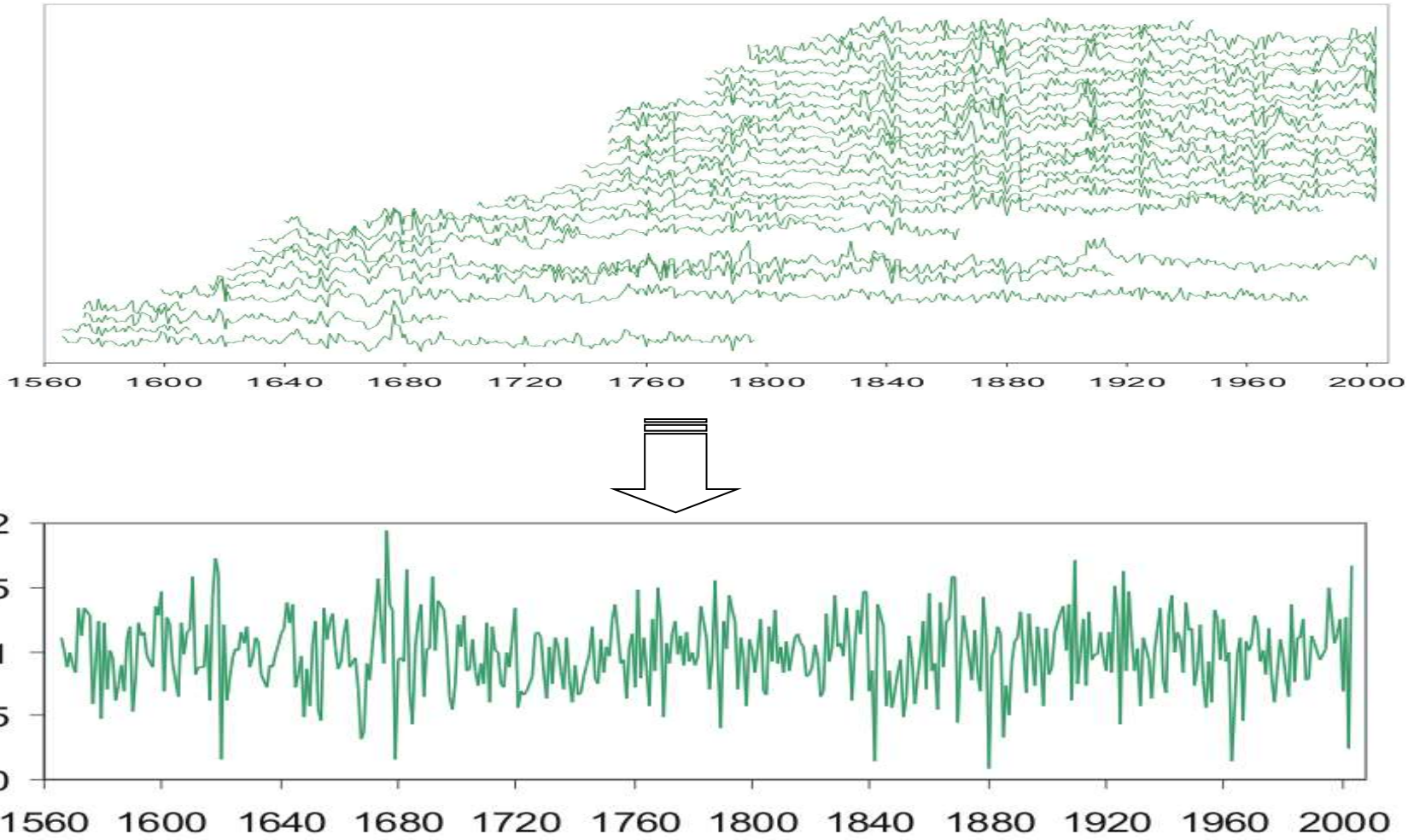
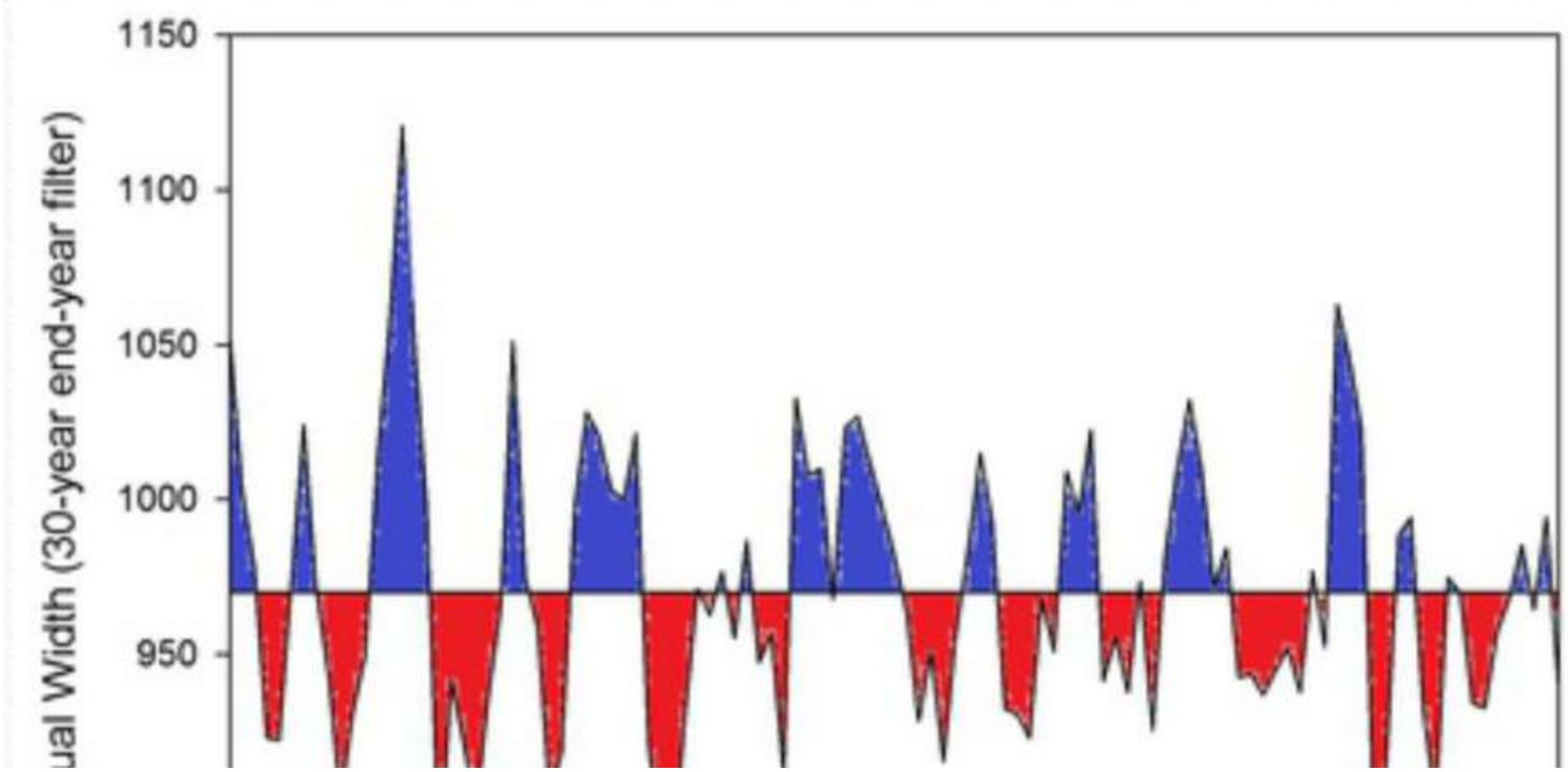
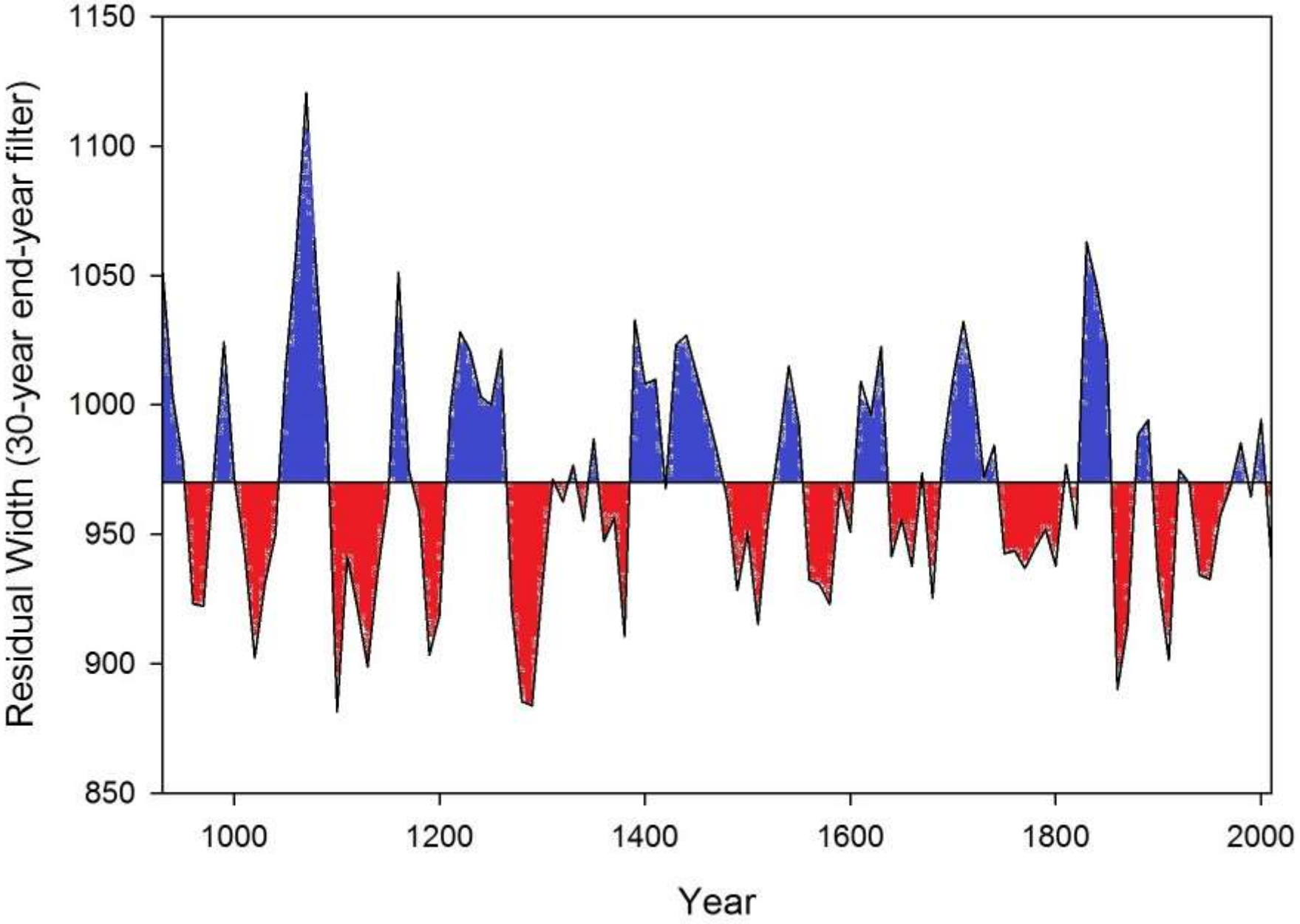


Image courtesy of J. Lukas (U. CO)

TREE RING CHRONOLOGIES




Residual Width (30-year end-year filter)
1150
1100
1050
1000
950
900
850
1000
1200
1400
1600
1800
2000
Year

Year

Ring Width (Residual and Standard)

choct_ew_res.crn
Download File

choct_ew_std.crn
Download File

Early Wood (Residual and Standard)

choct_ew_res.crn
Download File

choct_ew_std.crn
Download File

Late Wood (Residual and Standard)

choct_lw_res.crn
Download File

choct_lw_std.crn
Download File

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CHKres 8999990  09990  09990  09990  09990  09990  09990  09990  09990  09990  0
CHKres 900 994  6 657  6 696  6 974  62308  61114  6 968  61344  61394  61035  6
CHKres 910 421  6 787  61072  61180  6 896  6 871  61397  6 483  61339  61329  6
CHKres 920 942  61153  61167  6 771  61276  61130  6 672  61259  61032  6 977  6
CHKres 930 890  6 701  61283  61146  61390  61313  6 762  61201  6 917  6 767  6
CHKres 940 902  6 965  6 880  61024  61127  6 951  61011  61027  6 523  6 859  6
CHKres 9501227  6 754  6 618  61092  6 857  61023  6 724  6 971  6 889  6 935  6
CHKres 960 863  8 966  81154  81219  81099  81003  8 862  8 838  81038  8 784  8
CHKres 9701169  82059  81200  8 829  8 522  8 936  8 675  81310  8 725  81005  8
CHKres 9801207  81206  8 628  8 562  81076  8 912  81114  8 997  8 895  8 914  8
CHKres 990 786  8 968  8 876  8 883  8 464  81003  8 769  8 757  8 862  8 915  8
CHKres10001005  81053  81278  81258  8 861 11 626 111357 11 944 11 754 11 800 11
CHKres1010 653 11 613 111020 111013 11 703 11 992 11 853 11 850 11 901 11 732 11
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CHKres1050 725 141266 151394 15 828 15 749 15 960 151006 151482 151232 151334 15
CHKres1060 685 15 990 151084 151219 151820 151820 151085 151162 151046 151235 15
CHKres1070 799 15 752 15 494 151023 15 453 15 842 15 834 151077 15 476 151319 15
CHKres10801147 151019 15 897 15 736 151524 15 906 15 631 15 918 15 702 15 872 16
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CHKres11001048 161282 161060 16 972 161025 16 674 161126 171331 17 699 17 911 17
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CHKres12001242 23 824 221184 22 498 231626 231442 231525 231426 23 986 231469 22
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Future Work

- Streamflow Reconstruction of Choctawhatchee
  - What season or seasons?
  - Total width, Early and Late Wood Correlation?
- Need more Tree Ring Chronologies (TRCs)
  - Southeast is very limited in number of TRCs
  - TRCs were cored in the 1980's and 1990's
  - Geneva and Mobile Bay
  - Will supplement with regional TRCs from ITRDB
- Submit Update of Stahle's TRC to ITRDB
- Use in AL Water Policy (Instream Flows, Drought)
- Prepare Final Report (October 2015)

Thanks and Questions?

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