

**Running Head:** Dendroclimatology Conference, Tucson, May 2023

## MEETING REPORT

### DENDROCLIMATOLOGY CONFERENCE IN TUCSON, MAY 2023

DAVID C. FRANK, KEVIN J. ANCHUKAITIS, and STEVEN W. LEAVITT

The event “Dendroclimatology Conference: Past, Present, and Future” was hosted on the campus of the University of Arizona in Tucson by the Laboratory of Tree-Ring Research on May 3-5, 2023. Its conception originated from the confluence of four faculty retirements and the fields of dendrochronology in which the retirees specialized.

**DR. MALCOLM K. HUGHES** has contributed to building large-scale networks of “proxy” climate records. He works to establish new kinds of tree-ring records (new species, regions, and variables), update millennial and multimillennial chronologies, and examine tree rings and remotely sensed data to characterize forest growth and health. His interests further include understanding formation of tree rings through field sampling, quantitative wood analysis, and modeling of climate influence on tree-ring growth. He is a UArizona Regents Professor, a Fellow of both the American Geophysical Union and the American Association for the Advancement of Science, a College of Science (CoS) Galileo Circle Fellow, and a recipient of the Tree-Ring Society’s H.C. Fritts Lifetime Achievement Award in Dendrochronology. He was Director of LTRR from 1986 through 1999.

**DR. DAVID M. MEKO** applies tree-ring data to study the variability of streamflow, precipitation, and snowpack on timescales longer than the instrumental period. He has recently pursued hydroclimate investigations in basins in North Africa, Siberia, and the western United States. He has taught a long-standing applied time series analysis course at LTRR and was recognized with the CoS Galileo Circle Copernicus Award at UArizona for his long-standing contributions to tree-ring research

**DR. RAMZI TOUCHAN** integrates dendrochronology into natural and water resources management, having worked on this interface in studies of climate variability in the Mediterranean Basin, the southwestern US, and Russia. In addition, he created and instructs at the annual summer offerings of the “International Summer School: Tree Rings, Climate, Natural Resources, and Human Interaction” conducted in the US and abroad. He is a recipient of the CoS Galileo Circle Copernicus Award at UArizona for his long-standing contributions to tree-ring research.

**DR. CONNIE A. WOODHOUSE** has focused on understanding past hydroclimate to inform current environmental and societal concerns, with a focus on major watersheds in western North America. Dendroclimatology is central to her work, which extends to include the investigation of controls on hydroclimate, the challenges of managing natural resources (especially water) in the face of changing demands, climate extremes, and climate change impacts, and the role of scientists in addressing societal problems. She is a Regents Professor at the UArizona, a Fellow of the American Geophysical Union, and a recipient of the Tree-Ring Society’s J.A. Boninsegna Frontiers in Dendrochronology Award.

The event was widely advertised, and a conference emerged that was highlighted by an outstanding collection of volunteered presentations representing a wide range of research topics, interesting findings, and the current state of proxy-based climate science. The meeting started with a Bannister Tree-Ring Building tour and reception in the afternoon/evening of Wednesday, May 3, followed by morning and afternoon sessions on the next two days focused, on the following topics:

(1) *Tree-ring frontiers in space and time*

Research advances to preserve, extract, and quantify environmental variability with a focus on seasonal, multi-millennial, and intermediate time scales, as well as the extension of dendrochronology into new domains (May 4, morning)

**(2) *High-resolution multi-proxy palaeoclimatology***

Long-standing roles of innovation in utilizing and/or combining tree-ring and non-tree proxy archives and/or the integration of diverse observational data, measurement parameters, and models to understand past climate variation during the Holocene (May 4, afternoon)

**(3) *Stakeholders and actionable dendrochronology***

Advances, successes, and best practices of use-inspired research to address and help solve environmental and societal problems. In the panel that followed this session, participants discussed their motivations for doing research that considers decision-making, resource management, and/or policy applications, and what they found to be the biggest challenges and rewards for doing use-inspired dendrochronology (May 5, morning)

**(4) *Building Networks***

Conception, development, and analysis of coherent tree-ring networks, including data and related communities, to achieve insights into spatio-temporal responses of tree-ring parameters and related variability in the Earth system (May 5, afternoon)

The conference was attended by ca. 100 participants (Figure 1), including scientists and researchers, staff, and students from N. America, Europe, and Asia. The result was a very rich and diverse program of talks, with thoughtful panel discussions following each session:

**Session 1**

David Meko, *Sensitivity of streamflow reconstructions to the lagged response of tree growth to climate*  
Ed Cook, *Overview of Drought Atlas development: An evolving and hopefully improving process*  
Heather Haines, *Dendro Down Under: Expanding the use of dendrochronology in Australia*  
Flurin Babst, *Chasing spatial, temporal, and knowledge gaps in tropical dendrochronology*  
Julie Edwards, *Seeing both the forest and the trees: dendrochronology at the cellular scale*  
Paolo Cherubini, *Mediterranean false rings: A nightmare, or a sweet dream?*  
Richie Thaxton, *Spatial investigations in dendrochronology*

**Session 2**

Henry Diaz, *A random walk through a career*  
Bryan Black, *Of clams, trees, and multi-proxy histories of western North American climate variability*  
Diane Thompson, *Reconstructing El Niño-Southern Oscillation variability over the past millennium across the tropical Pacific basin*  
Ellie Broadman, *From lake mud to latewood: A multi-archive perspective on “high resolution” paleoclimatology*  
Lukas Wacker, *Reconstruction of past solar activity from tree-rings*  
Charlotte Pearson, *Tree-ring, ice-core, and radiocarbon constraints on the timing and impact of Aniakchak II and Thera eruptions*  
Lonnie Thompson, *Retreating alpine glaciers and higher temporal paleoclimate records*

**Session 3**

Peter Brown, *The use of tree-ring data in collaborative forest management*  
Steph McAfee, *Continued engagement -- How relationships are the road to useful and interesting science*  
Talia Anderson, *Moving towards co-production and CARE in climate and tree-ring research*  
Hung Nguyen, *Upper Mekong dams cause the highest dry season discharges in 270 years*

Greg Pederson, *Integrating paleohydrology into risk-based water resources planning in the western United States*

Nicholas Graham, *The Medieval Mono Lake low stands - Perception and policy* [presented by M. Hughes]

Ramzi Touchan, *Strengthening connections between dendrohydrology and water management in the Mediterranean Basin*

#### **Session 4**

Malcolm Hughes, *Wise stewardship of natural archives of past conditions - A burning question*

Daniel Griffin, *Democratizing dendrochronology*

Erika Wise, *The nodes of synoptic dendroclimatology*

Yu Liu, *Tree-ring networks in China*

David Stahle, *Drought and flood extremes on the Amazon River, 1790-1900*

Adam Csank, *Progress and potential in developing networks of tree-ring isotopes*

Kevin Anchukaitis, *Networks for studying hydroclimate variability across the Mediterranean*

This conference was a great success, not only because of the program and presenters, but also because of the tremendous supporting efforts of Dr. Pamela Pelletier and Ms. Skye Bennett. We further appreciate the contributions of College of Science Dean Carmie Garzione and Cheryl Tomoeda of the College's Development Office.

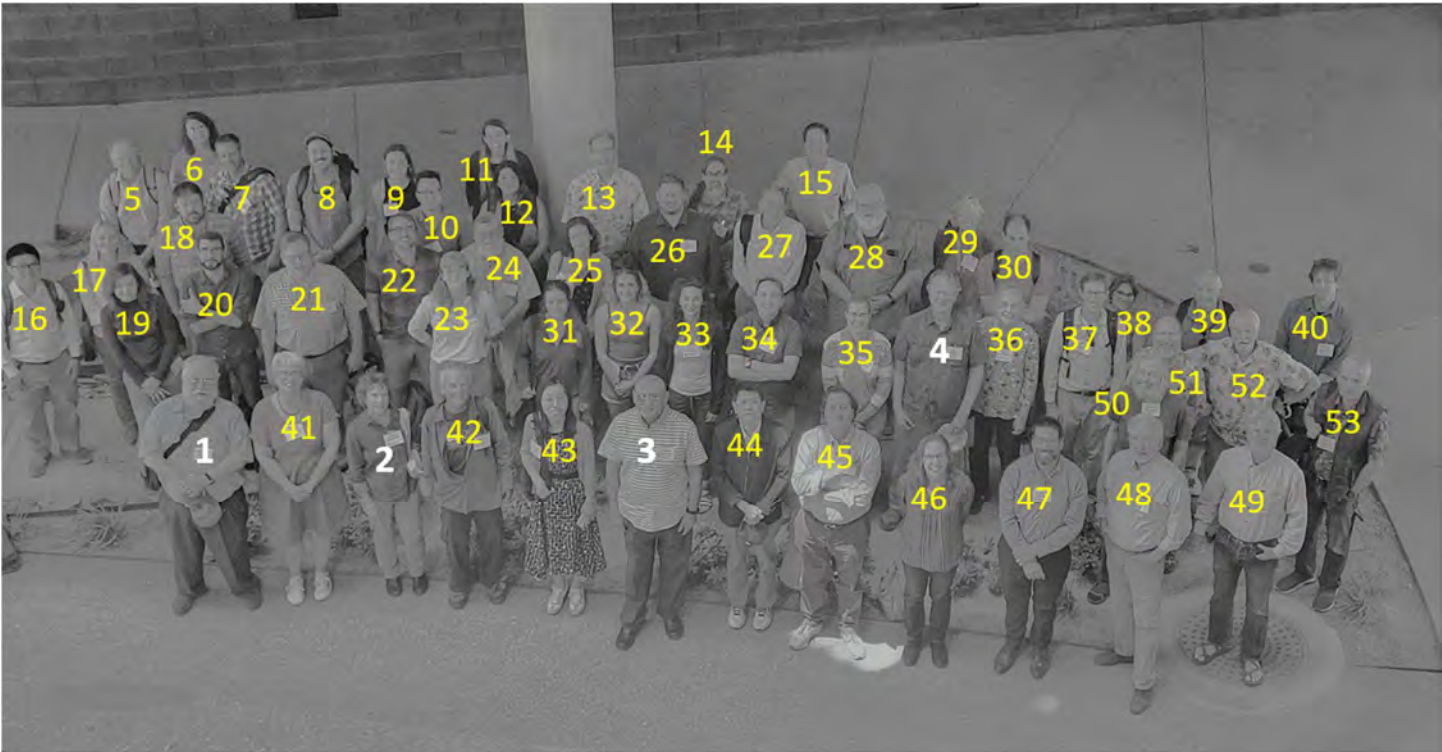
Names of attendees in **Figure 1**.

#### **HONORED LTRR RETIREES**

- 1.** Malcolm Hughes
- 2.** Connie Woodhouse
- 3.** Ramzi Touchan
- 4.** Dave Meko

#### **OTHER PARTICIPANTS**

5. Dan Cayan; 6. Skye Bennet; 7. Greg Pederson; 8. Brandon Strange; 9. Talia Anderson; 10. Kevin Anchukaitis; 11. Kira Harris; 12. Ana Isabel Gonzalez Mendez; 13. Paul Sheppard; 14. Adam Csank; 15. Mark Kaib; 16. Hung Nguyen; 17. Charlotte Pearson; 18. Will Tintor; 19. Dakota Larrick; 20. Alex Nolin; 21. Ed Wright; 22. Ben Cook; 23. Julie Edwards; 24. Ed Cook; 25. Maegen Rochner; 26. Jim Speer; 27. Lonnie Thompson; 28. Tom Swetnam; 29. Donna MacEachern; 30. Lukas Wacker; 31. Ellie Neifeld; 32. Kinzie Bailey; 33. Ellie Broadman; 34. Peter Brewer; 35. Heather Haines; 36. Katie Hirschboeck; 37. Bryan Black; 38. Stephanie McAfee; 39. Henry Diaz; 40. Dan Griffin; 41. Elaine Kennedy Sutherland; 42. Mark Losleben; 43. Qiufang Cai; 44. Yu Liu; 45. Paolo Cherubini; 46. Erika Wise; 47. David Frank; 48. Dave Stahle; 49. Peter Brown; 50. Martin Munro; 51. Greg Garfin; 52. Ray Bradley; 53. Steve Leavitt



**Figure 1.** Participants of the 2023 Dendroclimatology Conference in Tucson (upper) and legend of participants numbered according to list above (lower). Bold white numbers indicate the LTRR retirees. [photo courtesy of Pamela Pelletier]