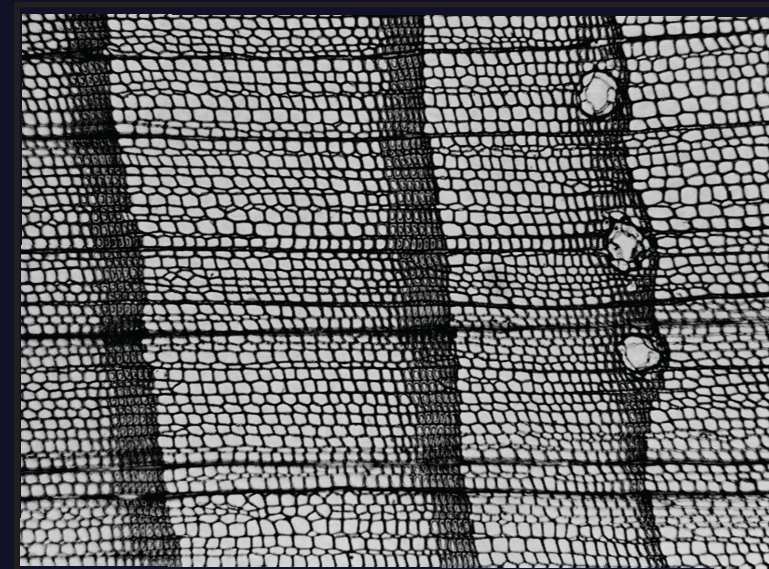
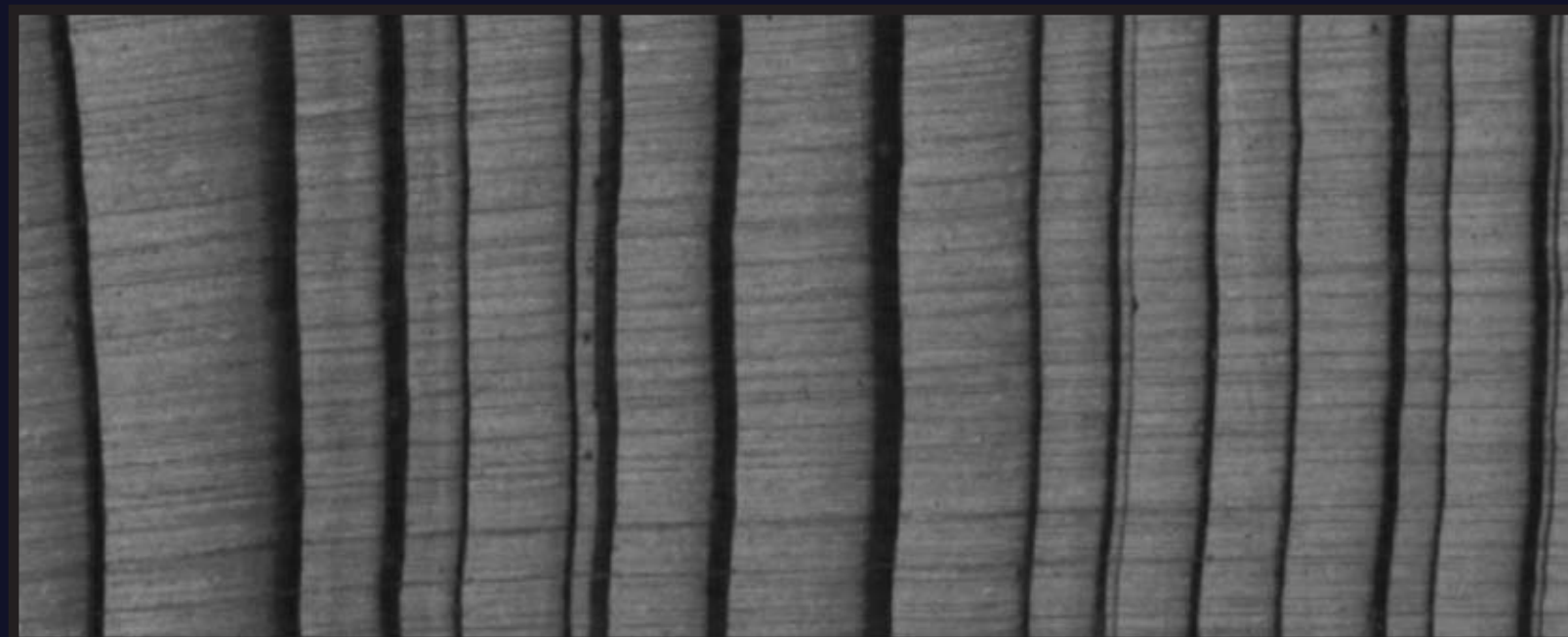


What Can Tree Rings Tell Us About Climate Change?

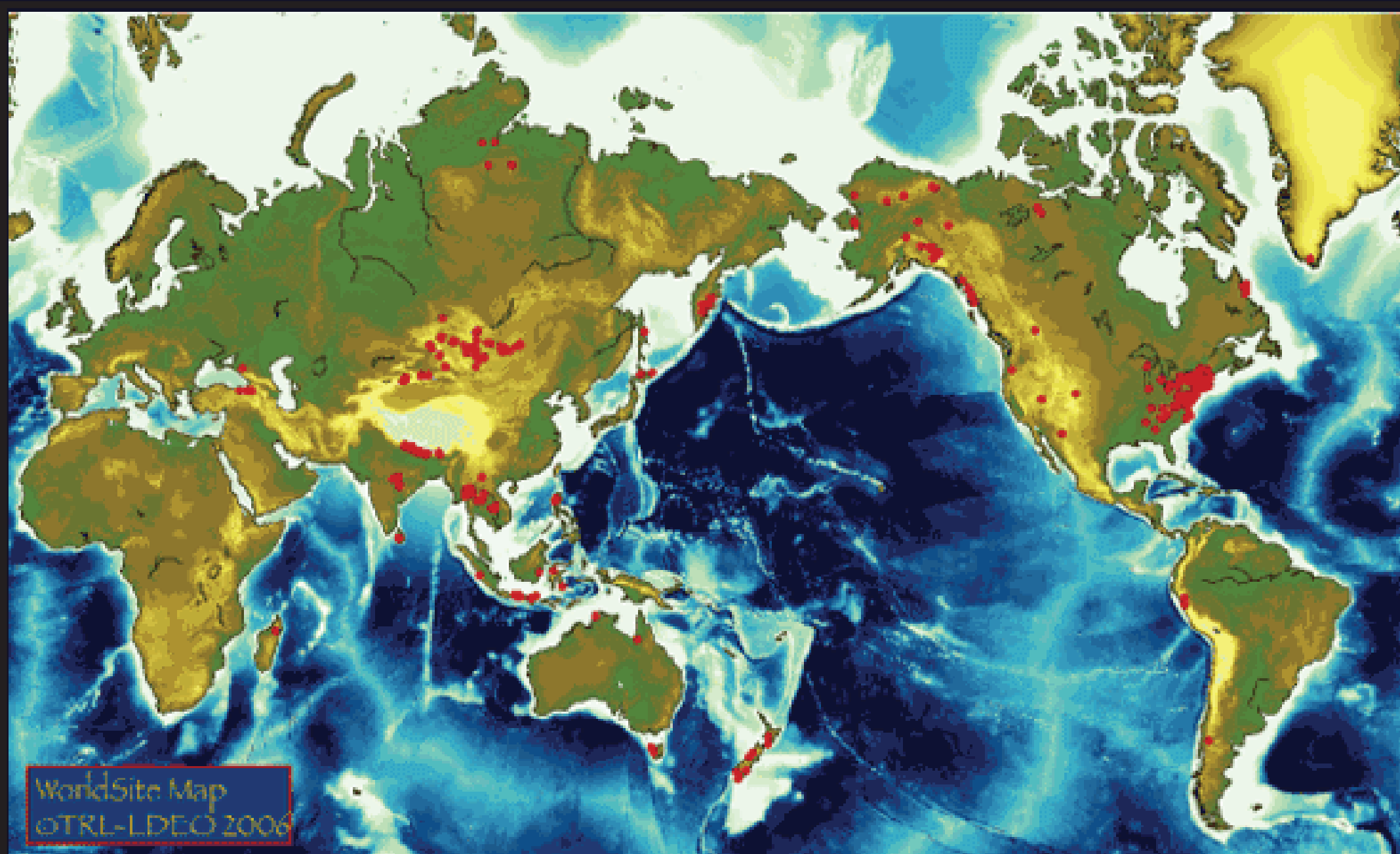
Much of our understanding of climate, and climate change, comes from station records from around the world. But these records are too short for us to fully understand climate cycles. We can use tree rings to supplement station records to more fully represent the range of natural variation, extremes, and trends. These longer reconstructions put recent climate trends into a long-term context, and allow for evaluation of past climate variability.

1. Growth rings of trees.



Most trees produce a growth ring every year. The width of the rings can give scientists information about what the climate was like the year the ring grew. By studying trees that live hundreds to thousands of years, we can develop a long-term perspective of climate and climate change.

2. Traveling around the world.



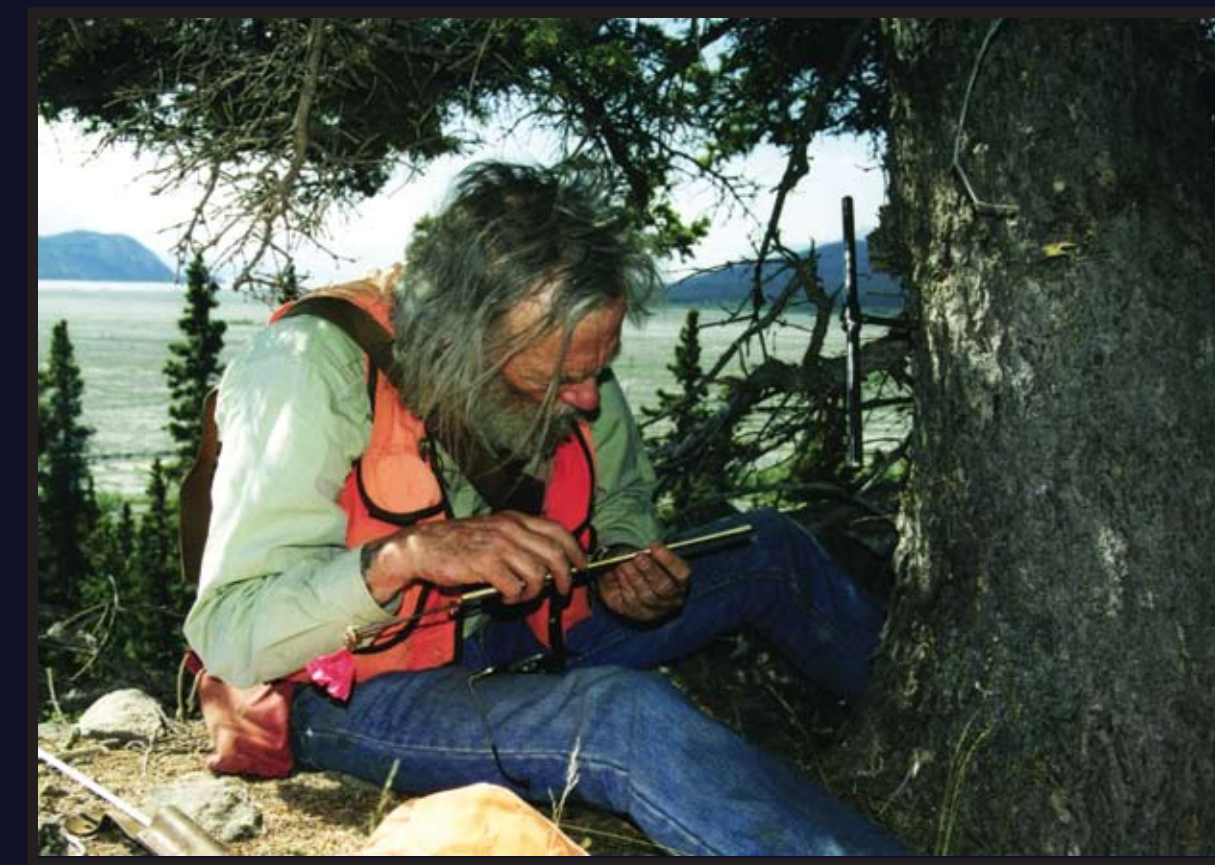
Scientists at the Tree Ring Lab travel around the world in search of long-lived, undisturbed trees. We have cored hundreds of species and many thousands of trees. For the past four years, scientists have been collecting tree-ring samples from Asia to better understand rains of the Asian monsoon, these rains, or lack there of, impact billions of people.

3. Sampling strategies.



Sampling strategies for dendrochronology vary, depending on the questions being asked. For example, to understand drought, we sample trees that grow in dry areas (above left) where a narrow ring would indicate a dryer year. To understand temperature, we sample trees from colder regions or high elevations (above right), where a narrow ring would indicate a colder year.

4. The essential tool.



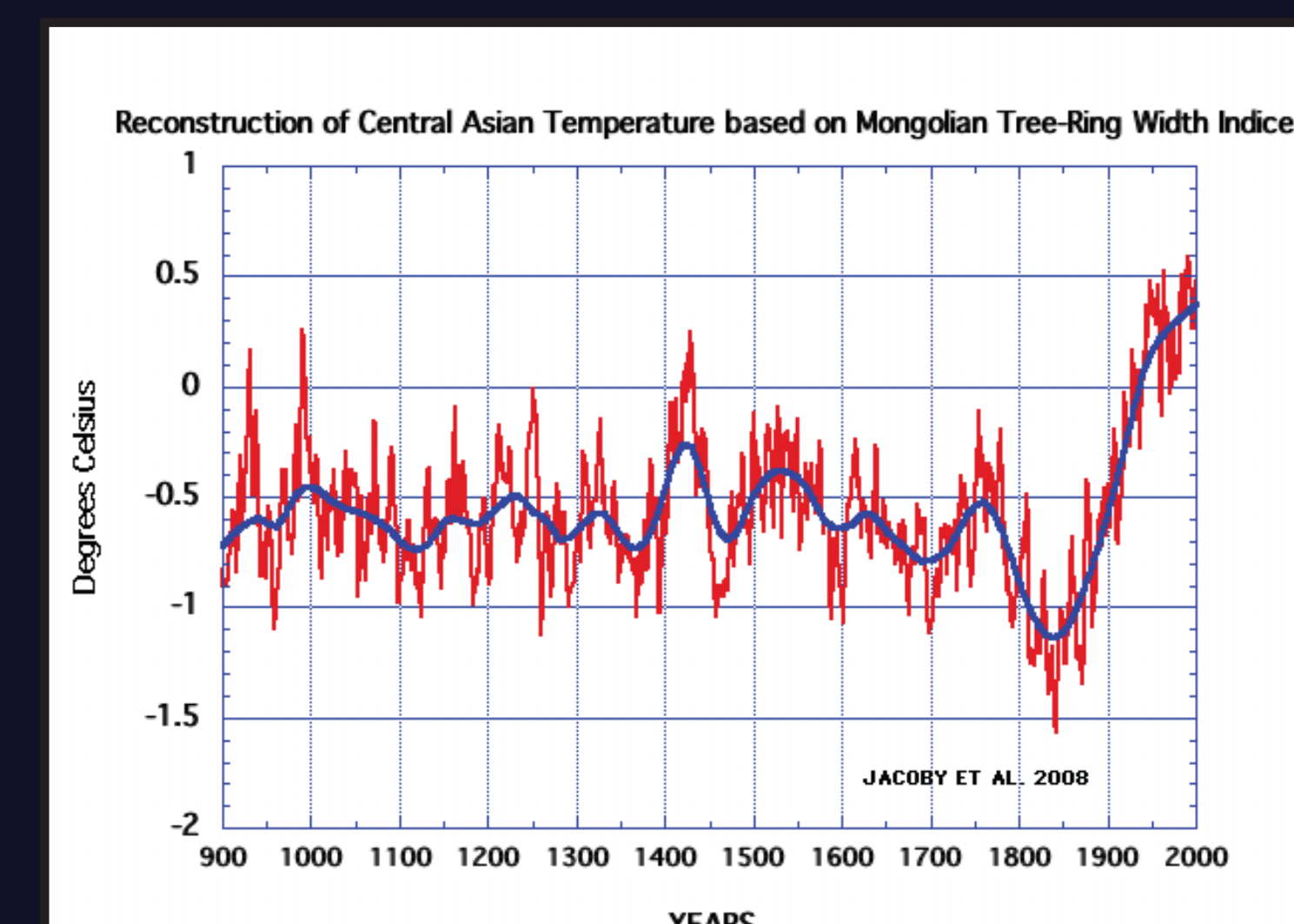
In the field, we use nondestructive increment borers to sample living trees. Each core is about 5 mm in diameter (size of a pencil). We typically sample a large population of trees (more than 20 trees when possible), taking two cores from each tree.

5. Creating long climate records.



We also sample “sub-fossil” wood, or trees that have been dead for decades, centuries or, in some cases, millennia. Above you can see dead trees that were covered and preserved by ash from a volcanic eruption in 800AD. By combining living- and dead-tree records we can extend climate records significantly.

6. Central Asia temperature.



By combining living and dead tree-ring samples, we created an 1,100 year tree-ring record of Asian temperature. Notice how the 20th century is the warmest period of the entire record.