



Climate Change & traditional knowledge on the Navajo Nation

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Climate change impacts and challenges facing Native American communities:

Tribal History: Where reservations were established-
important vulnerability

Because of the unique status of tribes, tribal histories, and political marginalization, tribal resources needed to cope with the changes are already stretched to the limit.

Big Uncertainty in impacts because tribal lands are poorly monitored and studies are sparse to non-existent-

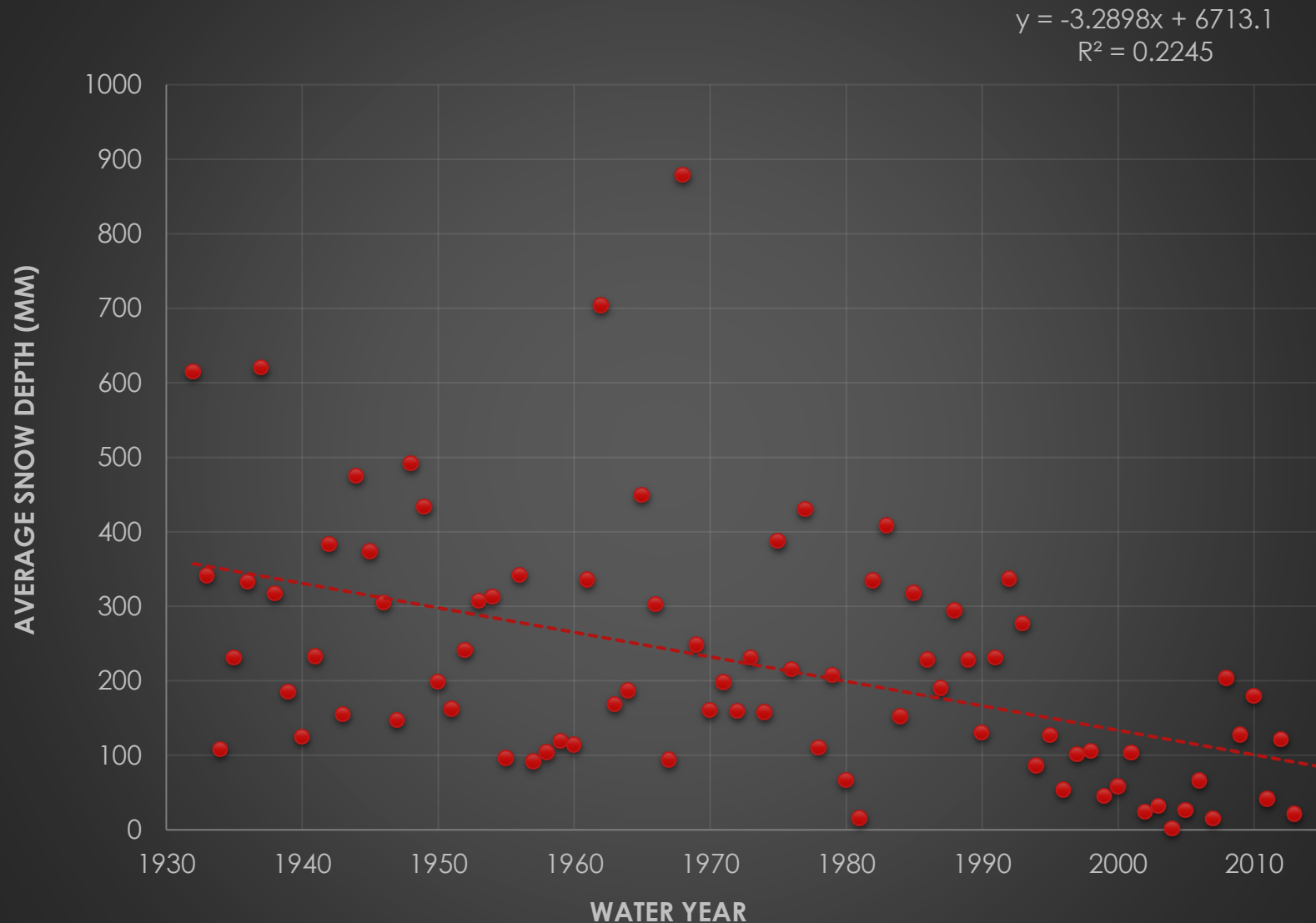
Sovereignty: Jurisdictional issues, water rights/allocations

Lack of capital and resources needed to deal with impacts

CC Impacts First Recognized as Impacting Peoples of the Arctic Region

- ▶ Brought human impacts into scientific discourse, and raised awareness
 - ▶ But also limited geographic extent of problem in the public eye
- ▶ Slow recognition of impacts on other Native lands
- ▶ Not much known on impacts to tribes in lower 48-
 - ▶ lack of scientific studies and resources to examine the changes occurring
 - ▶ but known examples show that impacts could be significant

As a result of higher temperatures the Navajo Nation is getting less snow

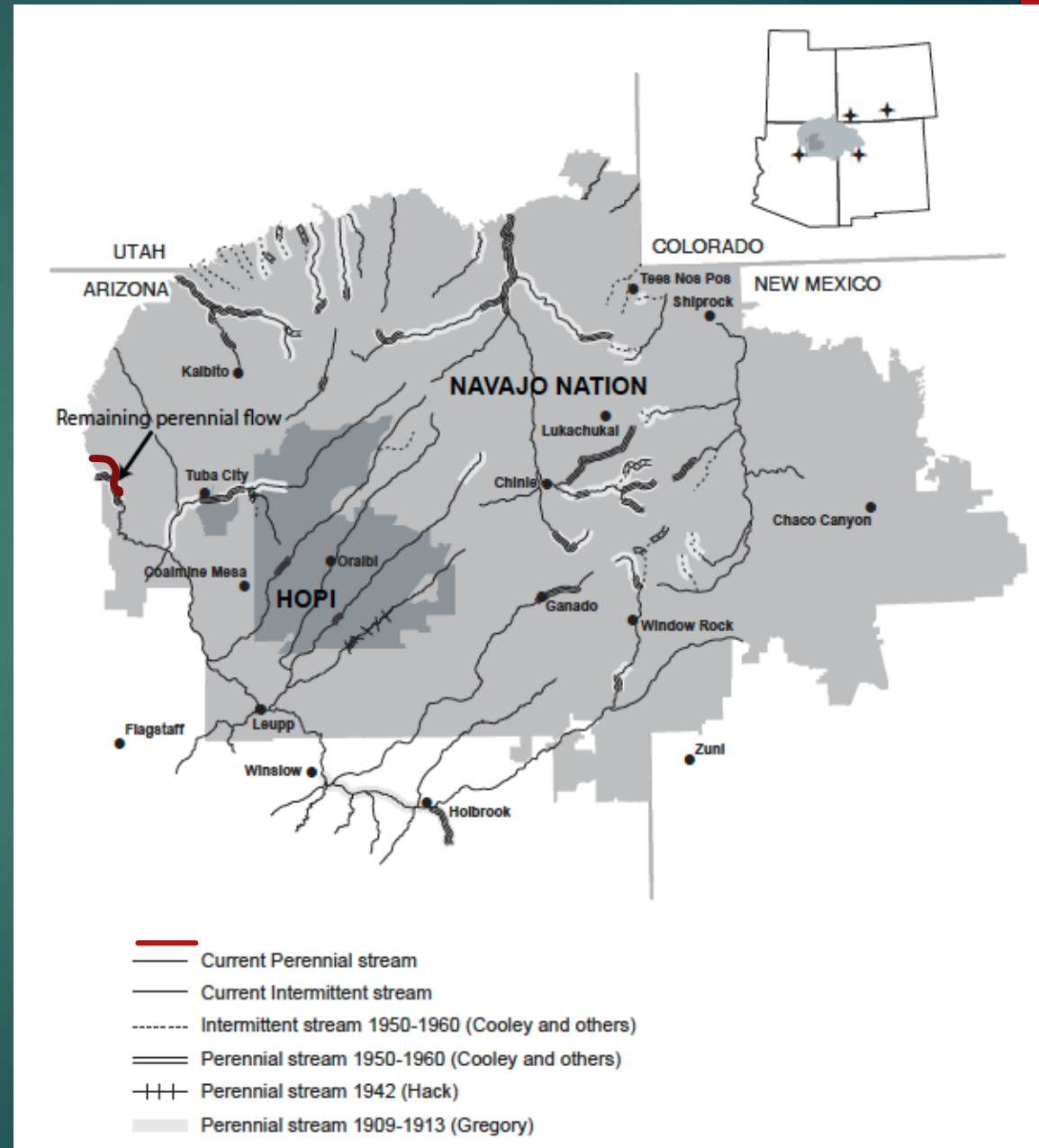
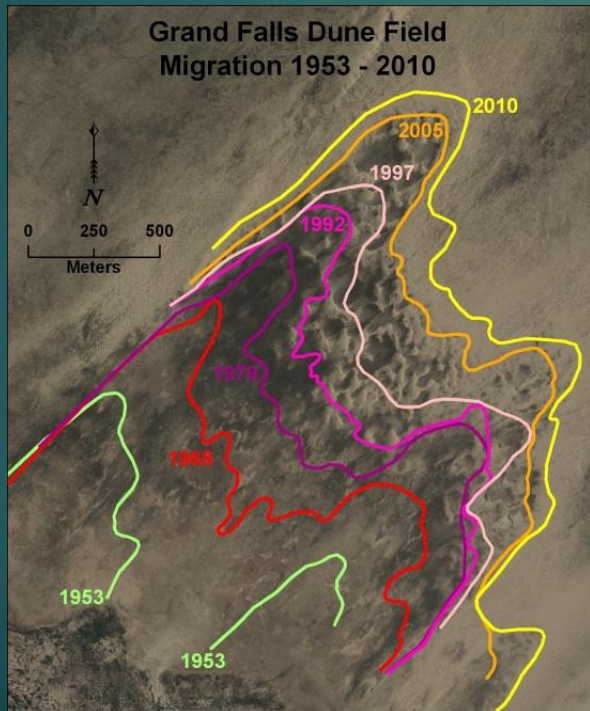


Redsteer,
Kelley,
Francis &
Block, in
press

Evidence of changes already underway-?

Changes in perennial stream flow in
areas where water resource
development has not occurred

Changes in the extent and
movement of sand dunes





Direction of sand transport

Dust from NE Arizona

UT

CO

AZ

NM



Flagstaff, AZ



OBSERVATIONS From 73 Elders:

Changes in Weather

- Today less rain and snow (all)
- In late 1930s - 1940s climate began to shift from wet to dry (oldest)
- In the 1940s the snow was big every year, chest high on the horses.
- The climate has gotten drier since 1944
- Since the 1990s there is drought & heat
- More moving sand & dust starting in 1950's
- In 1954, 1962 and 1999 there were strong wind storms
- In 1970s it began to get hotter and drier

Now it's hotter with more wind

Environmental Changes

- Until 1944, the ground stayed moist until July (Monsoon season)
- Until late 1970s there was enough water and people planted crops
- Springs and Lakes drying up
- Rivers flowing less often
- Disappearance of Beavers, Cranes, Herons, Egrets, Eagles, Lizards
- Disappearance of cottonwood trees, willows, ceremonial and medicinal plants
- Ceremonialists traveling farther to cooler, wetter high elevations for medicines
- New plants with no Navajo names

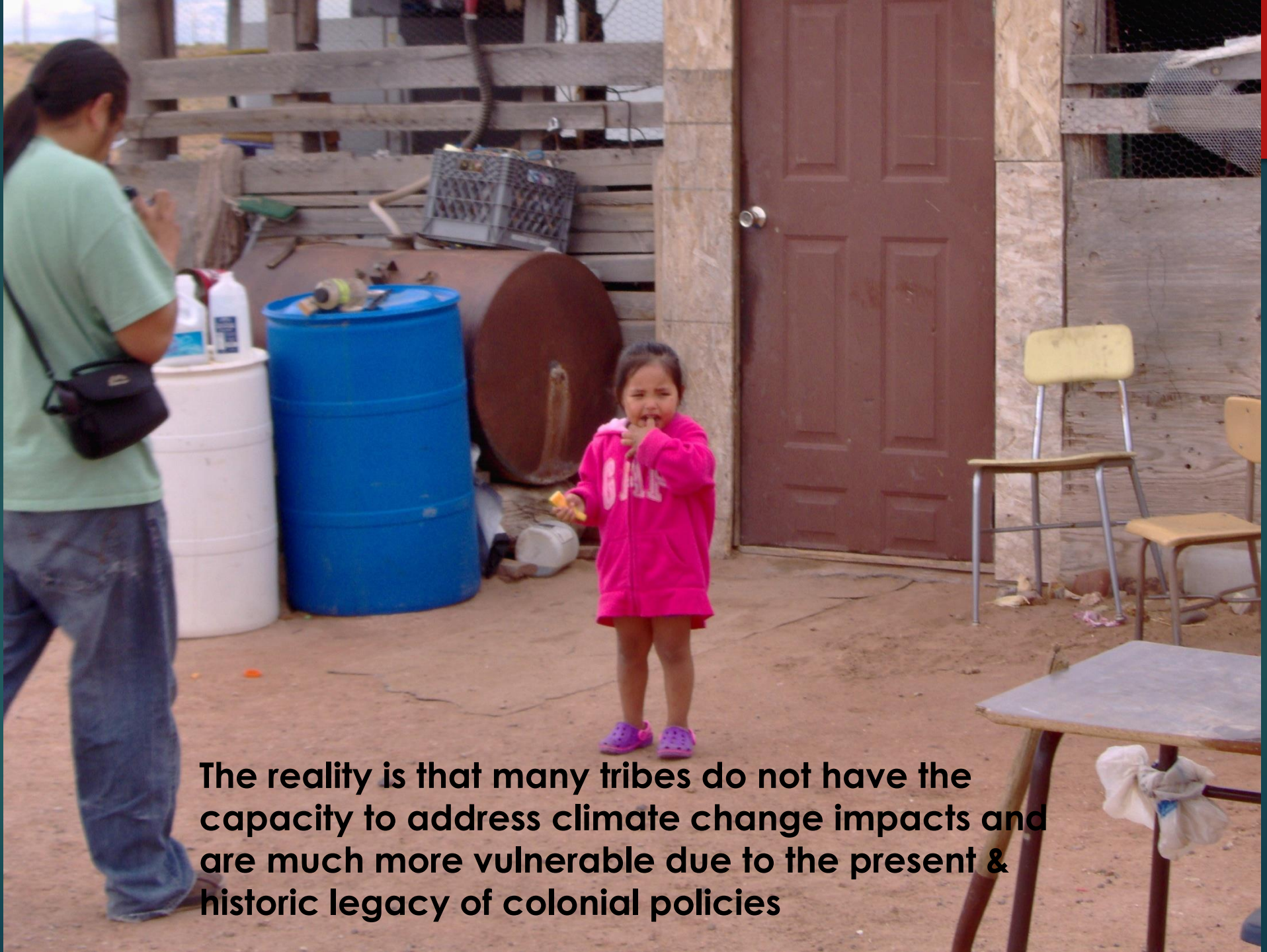
Increasing awareness of advantages of including indigenous people (TK) in CC studies

- ▶ How well are changes truly represented in literature?
- ▶ Harsh environments of arctic, mountains and deserts can provide knowledge about ecosystem sensitivity/ unanticipated feedbacks, and compelling evidence of change that motivates people to take action
- ▶ Could it be that ecosystems have been changing due to increased temperatures for a much longer period-
 - ▶ Are they more sensitive than currently recognized?
 - ▶ What kinds of ecosystem changes are there that conventional measurements are not capturing?
- ▶ Any empirical information to confirm/conflict with model projections in less remotely monitored areas?
- ▶ New climate surprises could be overlooked & current changes ignored!!

Increasing interest nationally & internationally in Traditional Knowledge

- ▶ Indigenous knowledge and practices have been crucial for communities to adapt to harsh conditions and changing environments, therefore indicating high adaptive capacity.
- ▶ Adaptation actions could be informed by traditional knowledge
- ▶ **Indigenous, local, and traditional knowledge systems and practices, including indigenous peoples' holistic view of community and environment, are a major resource for adapting to climate change (*robust evidence, high agreement*).**
Natural resource dependent communities, including indigenous peoples, have a long history of adapting to highly variable and changing social and ecological conditions. But the salience of indigenous, local, and traditional knowledge will be challenged by climate change impacts. Such forms of knowledge have not been used consistently in existing adaptation efforts. Integrating such forms of knowledge with existing practices increases the effectiveness of adaptation.

(Working Group II AR5 Technical Summary, 2014)



The reality is that many tribes do not have the capacity to address climate change impacts and are much more vulnerable due to the present & historic legacy of colonial policies

Adaptation is limited by loss of places and cultures

- ▶ Unique nature of places societies and cultures
- ▶ Identities bound to localities
- ▶ Cultural values
- ▶ Irreversible, undervalued loss

All of these issues are underscored in the discussions and observations of climate change in Native American Communities