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Director, South Central  
Climate Science Center

**DEVELOPING CLIMATE SAVVY TRIBAL SOCIETIES**  
**NCAI JUNE 27, 2016**

# KIM WINTON, USGS, DIRECTOR SOUTH CENTRAL CLIMATE SCIENCE CENTER

- ✗ Native to Oklahoma
- ✗ BS in Zoology/Ecology
- ✗ MS and Ph.D. in Agronomy/Ecology (weed control and environmental fate of pesticides)
- ✗ EPA (contractor) National Groundwater Risk Management Lab
- ✗ USGS – Water Science Center Director and Regional Tribal Liaison



*Build and fund multi-discipline research teams to address regional-scale climate needs of land managers.*

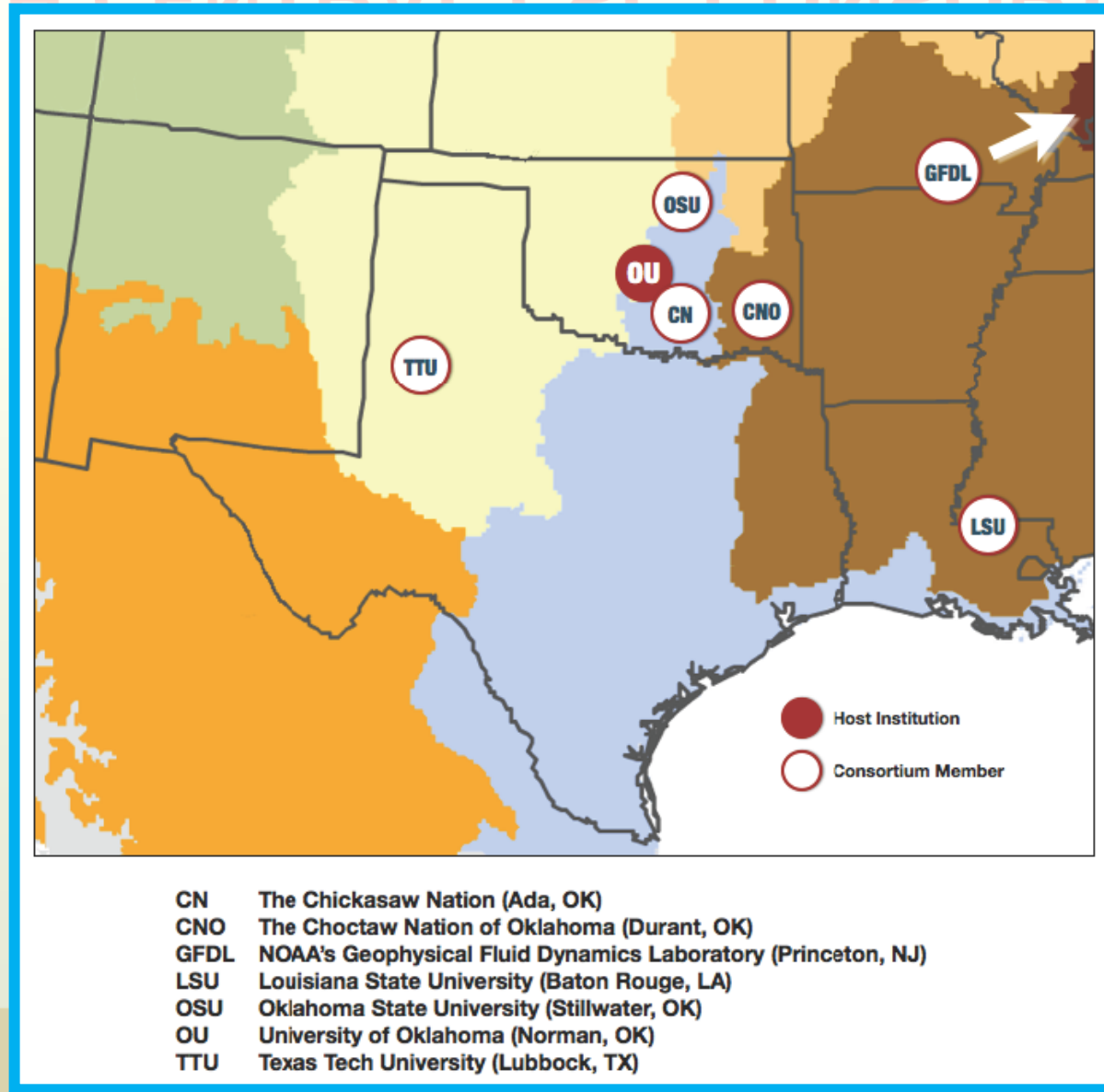
# OUTLINE

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- ✕ Description of South Central Climate Science Center (SC CSC)
- ✕ Overview of SC CSC Tribal Engagement Plan
- ✕ Example of development of water curriculum
  - + History of tribal water plans
  - + Types of classes offered
  - + Partnerships
  - + Curriculum development
- ✕ Funding Strategy for Climate Adaptation Plans



# SOUTH CENTRAL CSC CONSORTIUM



# SC CSC CONSORTIUM

- We are the only Climate Science Center with sovereign tribal nations on the consortium.
- We are the only CSC with 2 full-time tribal liaisons.

April Taylor in June 2012

Kim Merryman in June 2014

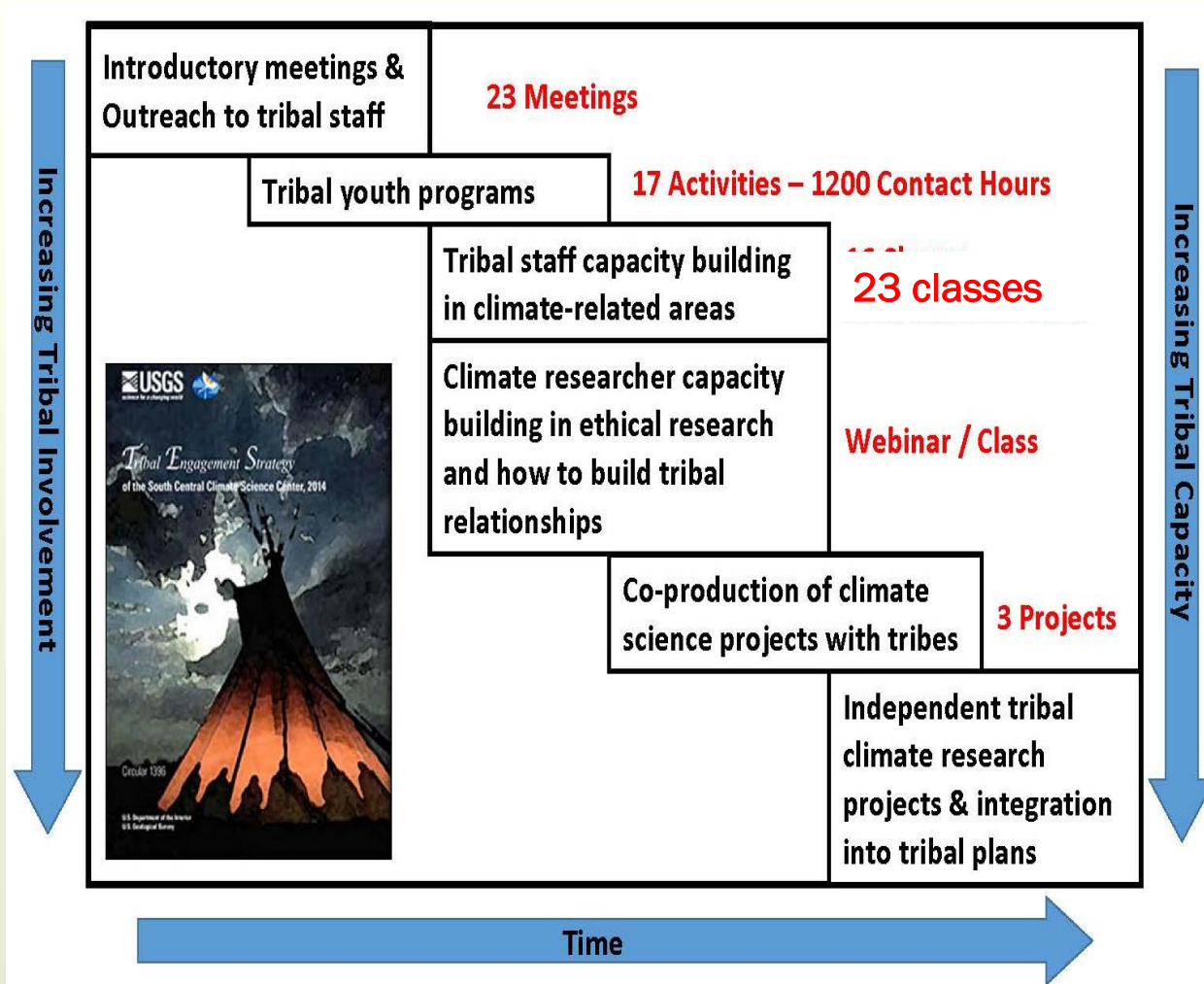
Also 9 Native American Interns!!



# TRIBAL ENGAGEMENT STRATEGY

Link for Tribal Engagement Plan:

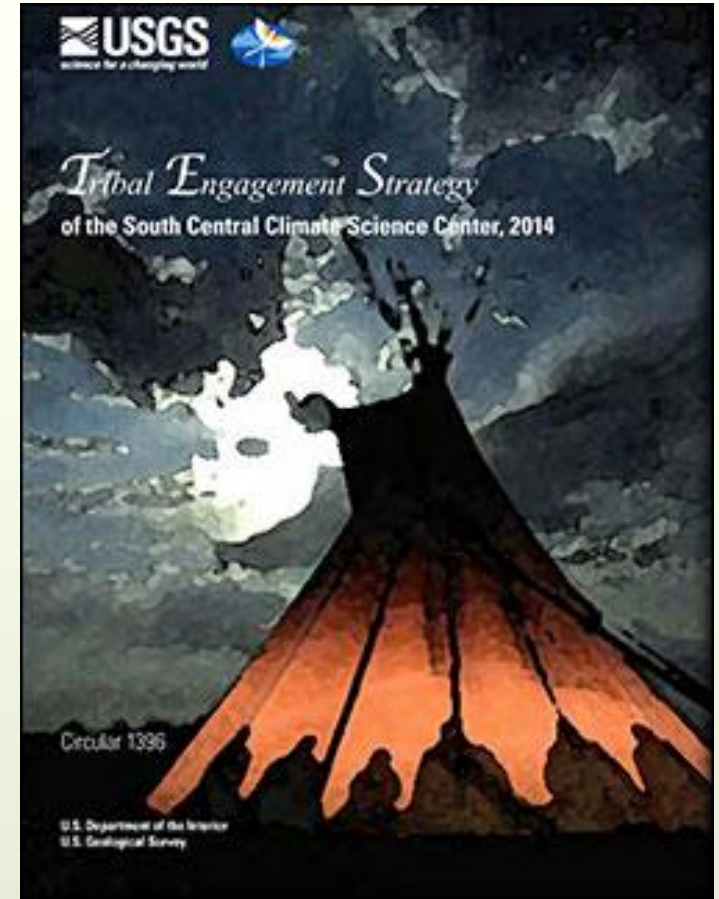
<http://pubs.usgs.gov/circ/1396/>



# TRIBAL ENGAGEMENT STRATEGY

In Years 1 & 2:

1. Consultation letters
2. Identify tribal representatives for advisory committees
3. Development of the strategy:
  - a) Strategy meetings
  - b) Review of similar tribal engagement strategies and discussion with others that work with tribes
  - c) Lead the CSCs and LCCs
  - d) **Published USGS Circular 1396**



Link for Tribal Engagement Plan: <http://pubs.usgs.gov/circ/1396/>



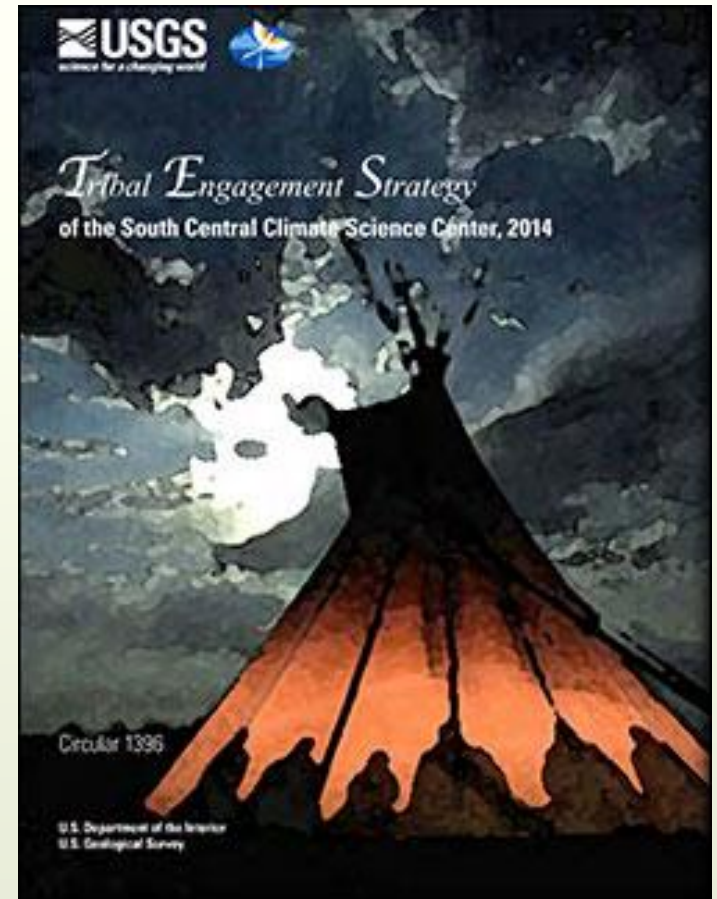
# TRIBAL ENGAGEMENT STRATEGY

In Year 3:

- Began class evaluations and better tracking
- Developed a SC CSC Annual Tribal Engagement Report

In Year 4:

- Begin bimonthly tribal trainings/ curriculum strategy meetings (internal to SC CSC)
- Begin quarterly interagency tribal engagement calls
- Curriculum Council — agencies, tribes, states, LCCs,
- Tribal College Conference (College of Muskogee Nation)

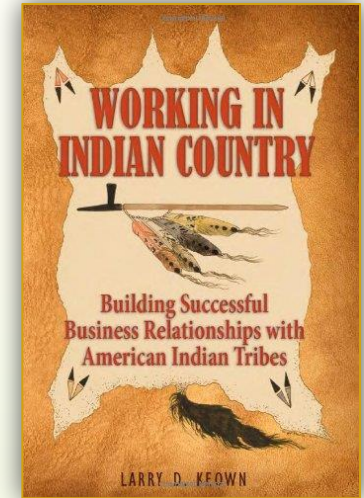




# TRIBAL ENGAGEMENT

## ✘ Tribal Youth Programs

- + 8 Northern Indian Pueblos Council  
Youth Environmental Summer Camp (2014, 2016)
- + Indian Education Summit (teachers)
- + Many tribal festivals w/ climate games for youth
- + Tribal College Conference



## ✘ Building Researcher Capacity

- + Working in Indian Country



# TRIBAL ENGAGEMENT WITH PARTNERS

- ✕ **Building Tribal Staff Capacity**
  - + **Climate 101** for Tribes with SCIPP (NOAA RISA)
  - + **Tribal Vulnerability Assessment** Training with BIA & Chickasaw & Choctaw Nations
  - + **Environmental Problem Solving** with GIS with USGS OK Water Science Center, Bureau of Reclamation, Tribal GIS, USGS Office of Tribal Relations





# HISTORY/EXAMPLE

- ✗ Every 10 year the State of Oklahoma is required to revise their comprehensive water plan
- ✗ There have been many water rights issues in the last 10 years between state and tribal sovereign nations
- ✗ Tribes wanted their own water plans
- ✗ There was **need to develop the capacity**



Itaipu Dam, Paraguay/Brazil. The world's largest hydroelectric facility.  
Credit: Itaipu Binacional



# CLASSES OFFERED & **FORMAT**

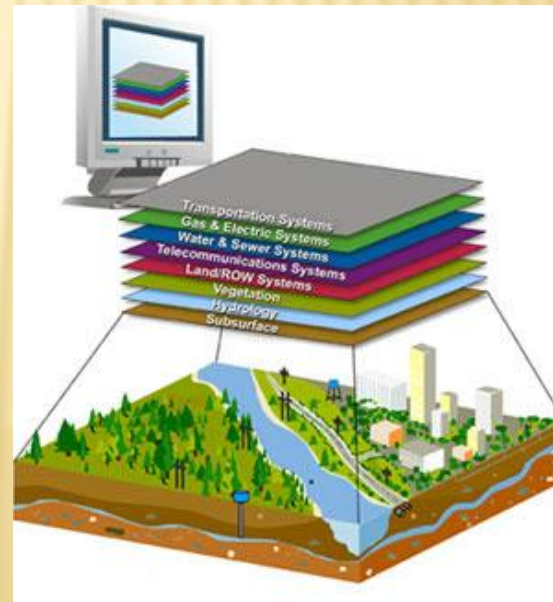
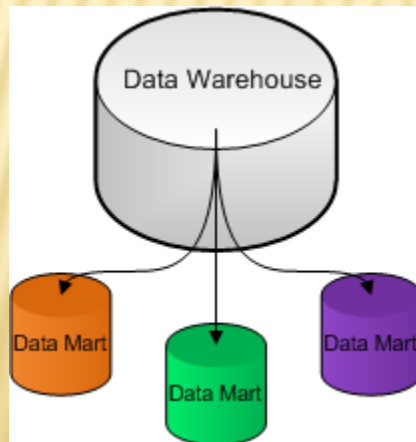
- ✘ **Introduction to Water Quality** - **Distance Learning** w/ vo-techs and one USGS person at each, with central location for teaching staff (also used videos of USGS staff in field, later developed into on-line training)
- ✘ **Water Quality Intensive** – **classroom** and **waders** – part per billion protocols
- ✘ **Rapid Ecological Assessments** – class and **field** demo
- ✘ **How to design a watershed-scale study** – classroom with **hands-on** activities and debrief





# CLASSES OFFERED & FORMAT (CONT')

- ✘ Data Analysis (OMG I have generated gobs of data...now what do I do with it?) – classroom, **hands on exercises**
- ✘ Environmental and Cultural Problem Solving with GIS and Arc Hydro



# CLASSES OFFERED & FORMAT & PARTNERSHIP

- ✘ **Introduction to Water Quality** - Distance Learning w/ vo-techs and one USGS person at each, with central location for teaching staff (also used videos of USGS staff in field, later developed into on-line training)
- ✘ **Water Quality Intensive** – classroom and waders – part per billion protocols
- ✘ **Rapid Ecological Assessments** – class and field demo
- ✘ **How to design a watershed-scale study** – classroom with hands on activities and debrief
- ✘ **EPA** funded a tribe, pass-through funds to USGS, all tribes invited, Oklahoma staff + Specialists and trainers across **USGS**
- ✘ **EPA + BOR + USGS** – mostly Oklahoma staff
- ✘ **BOR – USGS staff and EPA** protocols
- ✘ **USGS** \$ and USGS staff



# CLASSES OFFERED & FORMAT & PARTNERSHIP (CONT')

- ✗ **Data Analysis** (OMG I have generated gobs of data...now what do I do with it?) – classroom, hands on exercises
  - ✗ **Environmental and Cultural Problem Solving with GIS and Arc Hydro\***
  - ✗ **USGS** and USGS staff
  - ✗ **BIA + BOR + USGS + Tribal GIS (non-profit)** – trainers were USGS, Choctaw Nation of OK, Chickasaw Nation, University of OK, Tribal GIS, SIPI (facility & computer), OU Center for Spatial Analysis
- \*Taught as part of SC CSC and OK WSC



# KEY TO THE “CURRICULUM”

Water Quality 101 - Intensive

Water Quality Intensive – Introduction (videos field activities)

Rapid Ecological Assessment

Designing a Watershed Scale Study

OMG I have all this data....Data Analysis

Environmental Problem Solving with GIS

Year 1.....Year 2.....Year 3.....Year 4.....Year 5.....Year 6





# KEY TO THE “CURRICULUM”

Water Quality 101 – *Quick overview*

Water Quality Intensive - *Intensive*

Rapid Ecological Assessment – *Brief introduction*

Designing a Watershed Scale Study

OMG I have all this data....Data Analysis

Environmental Problem Solving with GIS

Year 1.....**Year 2**.....Year 3.....Year 4.....Year 5.....Year 6

# KEY TO THE “CURRICULUM”

Water Quality 101

Water Quality Intensive - Refresher

Rapid Ecological Assessment - Intensive

Designing a Watershed Scale Study - Introduction

OMG I have all this data....Data Analysis

Environmental Problem Solving with GIS

Year 1.....Year 2.....**Year 3**.....Year 4.....Year 5.....Year 6



# KEY TO THE “CURRICULUM”

Water Quality 101

Water Quality Intensive

Rapid Ecological Assessment - Review

Designing a Watershed Scale Study - Intensive

OMG I have all this data....Data Analysis - Introduction

Environmental Problem Solving with GIS

Year 1.....Year 2.....Year 3.....**Year 4**.....Year 5.....Year 6





# KEY TO THE “CURRICULUM”

Water Quality 101

Water Quality Intensive

Rapid Ecological Assessment

Designing a Watershed Scale Study -Review

OMG I have all this data....Data Analysis - Intensive

Environmental Problem Solving with GIS - Intro

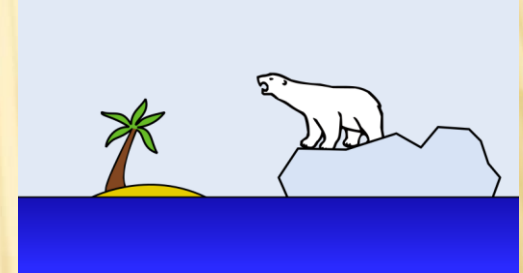
??? What next....Environmental  
Problems Solving done at SC CSC

Year 1.....Year 2.....Year 3.....Year 4.....**Year 5**.....Year 6



# STATUS OF CLIMATE CURRICULUM

- ✗ Climate 101
- ✗ Responding to extreme events
- ✗ Vulnerability assessments
- ✗ Intro to adaptation planning
- ✗ Outreach for youth (tree rings, ocean acidification, fire, climate games, greenhouse gas)
- ✗ Guide book and class for academic researchers “Working with Tribes”
- ✗ Grant Writing



# PARTNERS TO DATE

## PARTNERS

- ✕ USGS Office of Tribal Liaison
- ✕ BOR
- ✕ USGS OK WSC
- ✕ OU
- ✕ Choctaw Nation of Oklahoma
- ✕ Chickasaw Nation
- ✕ Tribal GIS
- ✕ SIPI
- ✕ ITEP
- ✕ BIA
- ✕ FWS (NCTC)
- ✕ Others....

## TRIBAL AUDIENCE

- ✕ Tribal environmental staff
- ✕ Cultural resources
- ✕ Economic development
- ✕ Health professionals
- ✕ Leaders
- ✕ Emergency responders
- ✕ Transportation

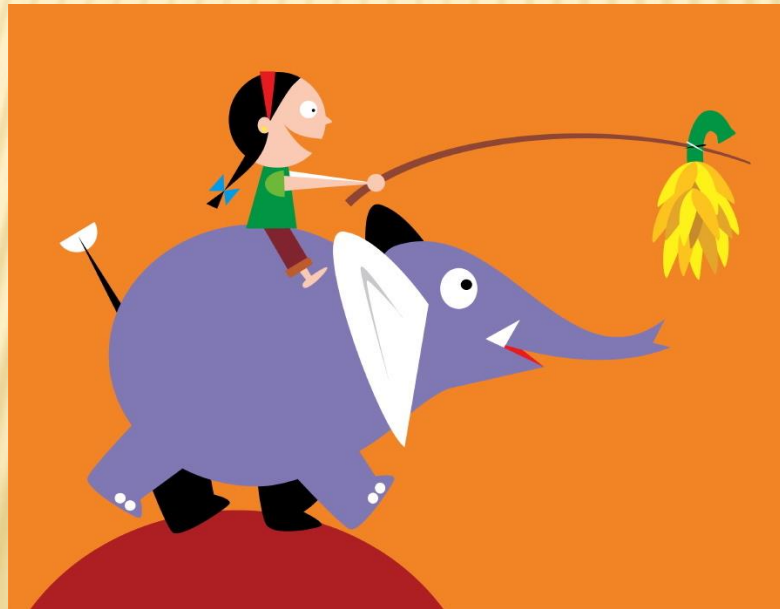
# ADDITIONAL CONSIDERATIONS

- ✗ Climate Change is **VERY multidisciplinary**, who in the tribes are our “audience” (environmental, cultural, planners, leaders, ...)
- ✗ These efforts forge the **relationships** with tribes...Once relationships are built it helps us understand their future needs, and develop classes to address these needs
- ✗ **Various audience/student needs:** with climate change actions (vulnerability assessments, adaptation planning, agricultural needs, cultural resources staff, climate 101, grant writing....other?)



# FUNDING STRATEGY

- ✗ Example: Need \$1M for water model
- ✗ “eat the elephant one bite at a time”





**NEXT TOPIC....ON TO FUNDING STRATEGIES?**



# STRATEGY

- ✖ Build an “umbrella proposal strategy”
- ✖ Small, sequential proposals that add up to a larger project
- ✖ Leverage each product and funding for additional proposals
- ✖ Get to know the needs of the funding agency
- ✖ Partnership is important



# \$1M TOTAL FOR WATER MODEL



State of the Science-Gap  
Analysis

Monitoring wells

Water quality analysis

Springs inventory

Base Flow analysis

GW/SW interaction

*Final product is the interactive modeling tool that is useful for the water plan*



# ADVANTAGES

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- ✖ Funding agencies see results and products at each step
- ✖ Builds confidence of funding agency that they will get products and that they are funding a small piece of something BIG.
- ✖ Funding amounts gets larger per proposal
- ✖ Enhances the overall state of the science to do projects sequentially



# \$\$\$ TOTAL FOR ADAPTATION PLANNING

