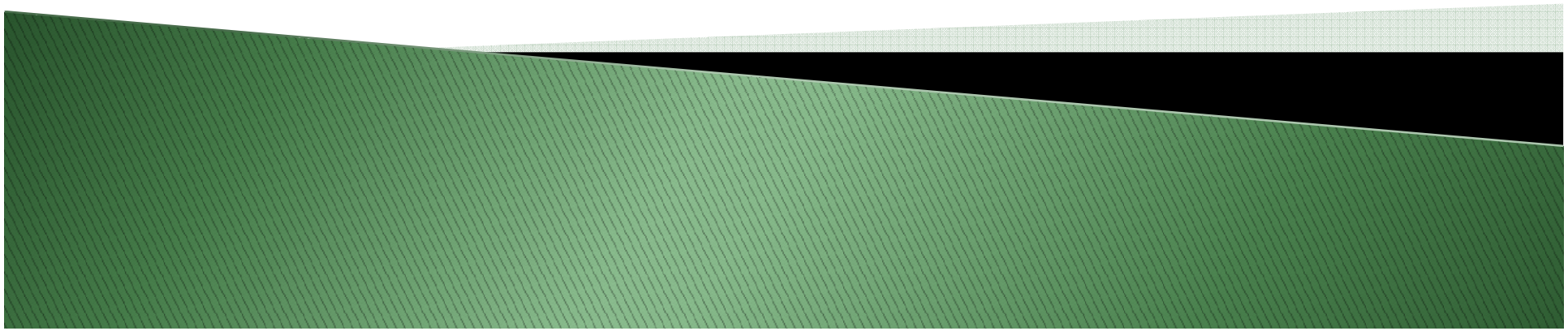
Texas Statewide Assessment of Forest Ecosystem Services



Objectives

- Quantify and assess the values of the various non-market ecosystem services provided by the Texas forests

- Create a geospatial dataset that allows users to generate custom ecosystem service value reports from an application on www.texasforestinfo.com

- Raise awareness of the overall value of Texas forests

Forest Ecosystem Services

- $ Timber, wood fiber, fuel wood

Provisioning Services

- Gas regulation and climate control
- Carbon sequestration
- Watershed services (water supply and quality)
- Clean air
- Soil stabilization and erosion control

Regulating Services

- $ Recreational opportunities
- Aesthetic, cultural, and existence uses

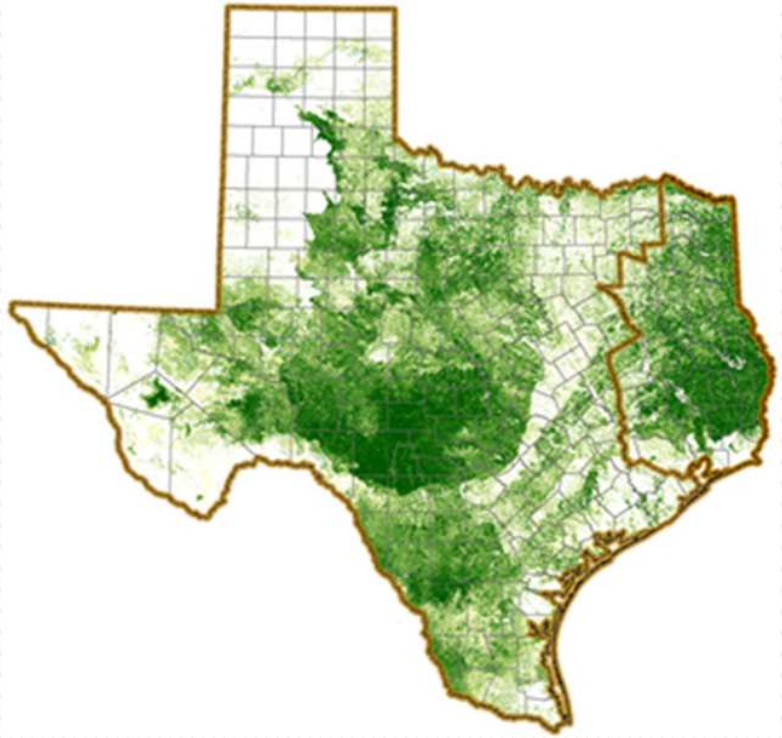
Cultural Services

- Wildlife habitat and biodiversity
- Soil formation

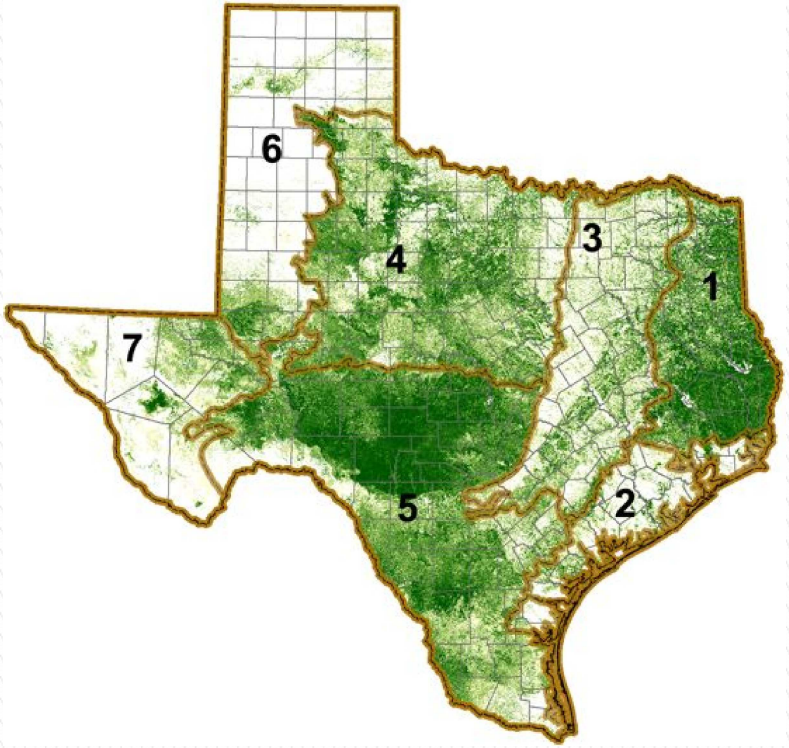
Supporting Services

Scope – Forest in Texas

Over 60 million acres of forestlands
- Public and private
- Include forests in urban areas



Two Broad Regions



7 Ecoregions

Scope – Ecosystem Services

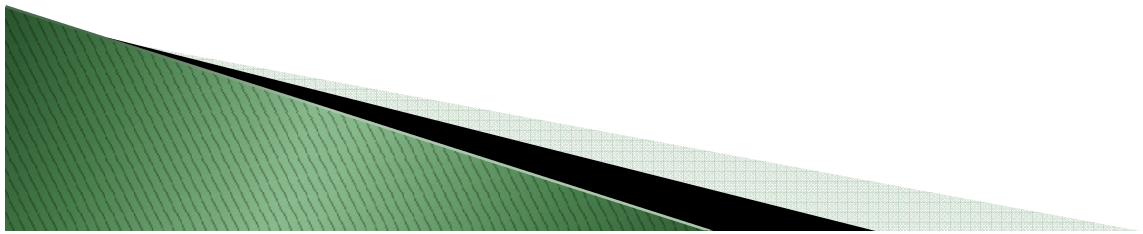
- Air Quality
  - Ability of forests to remove air pollutants
- Biodiversity
  - Capacity of forests to support essential biological diversity
- Climate
  - Carbon storage and accumulation
- Cultural
  - Non material benefits (aesthetic, spiritual, leisure) provided by forests
- Watershed
  - Ability of forests to produce a continuous, stable supply of clean drinking water and reduce flooding

Methodology —Valuing Ecosystem Services

- Benefit transfer (literature review)
  - Convert estimates to constant 2011 USD
- Original research (survey & econometric modeling)
- Sensitivity analysis – compared impact to service value and total value by adjusting benefit transfer values

Forest Watershed Service Valuation

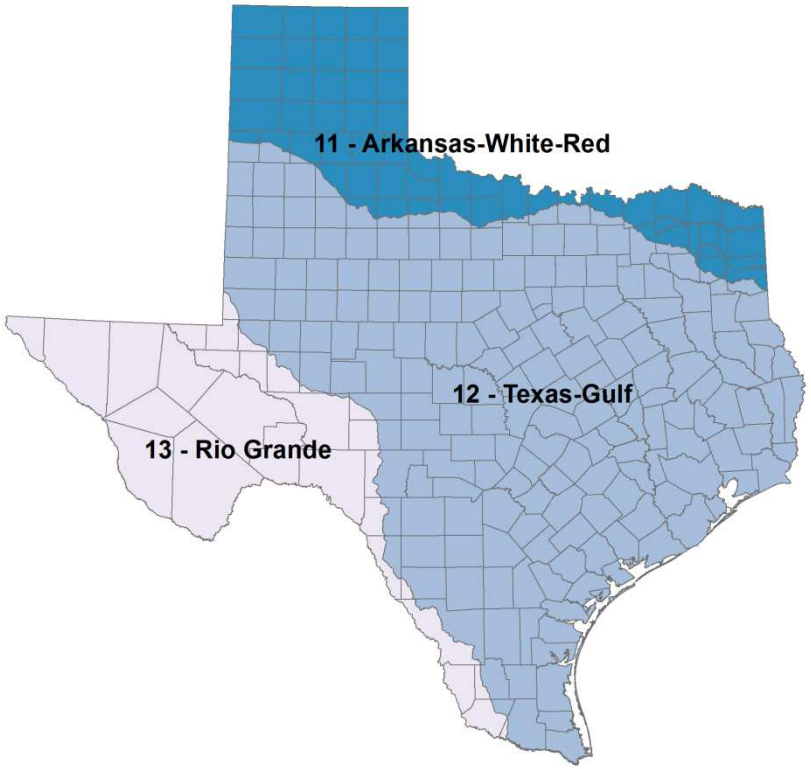
- Three primary functions:
  - Water Capture (Water Supply)
    - Marginal value of streamflow
  - Water Filtration (Water Quality)
    - Avoided water treatment costs
  - Water Regulation / Disturbance Prevention (Flood Control)
    - Stream regulation + Flood Control



Water Capture

- Precipitation – Evapotranspiration = Water Supply
  - Marginal value of streamflow
  - Woody brush in West Texas
  - Consistent value across forest types

- Water capture value based on WRR
  - Arkansas-White-Red ($19.31/ac-ft)
  - Texas-Gulf ($28.31/ac-ft)
  - Rio Grande ($63.45/ac-ft)



Water Filtration

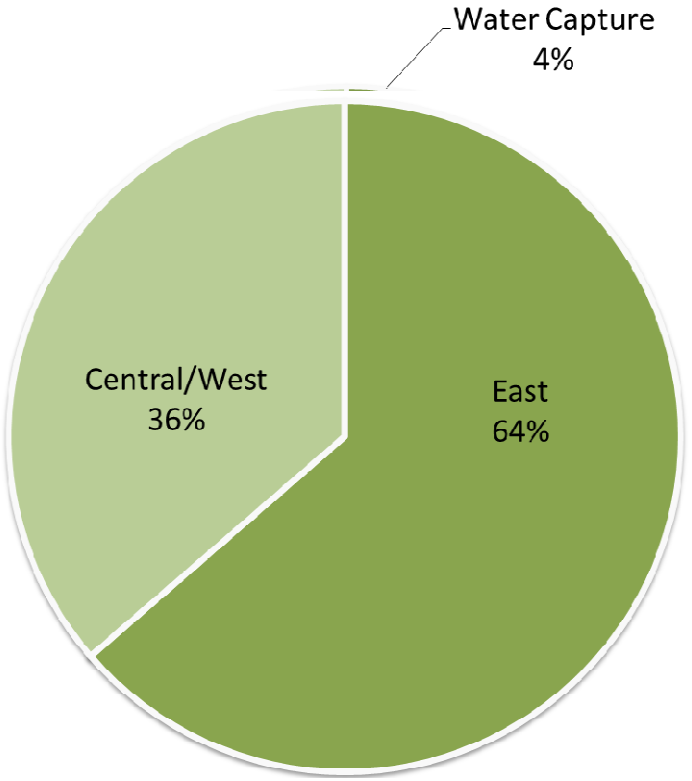
- Avoided Water Treatment Costs
  - Base Value
    - TPL and AWWA study of 27 public water utilities
    - $19.36/ac-ft
  - Riparian forests
    - Sediment and nutrient filtration efficiency - effect on water treatment costs
    - $120.17/acre
  - Wetland forests
    - Meta analysis of individual wetland function valuations
    - $724.98/acre

Water Regulation / Disturbance Prevention

- Two functions
  - Stormwater Management
    - Engineering / construction replacement costs of green infrastructure
    - Valued only on forests in urban areas ($662.96/acre)
  - Flood Control
    - Property damage prevention
    - Riparian forests ($116.45/acre)
    - Wetland forests ($1,758.18/acre)

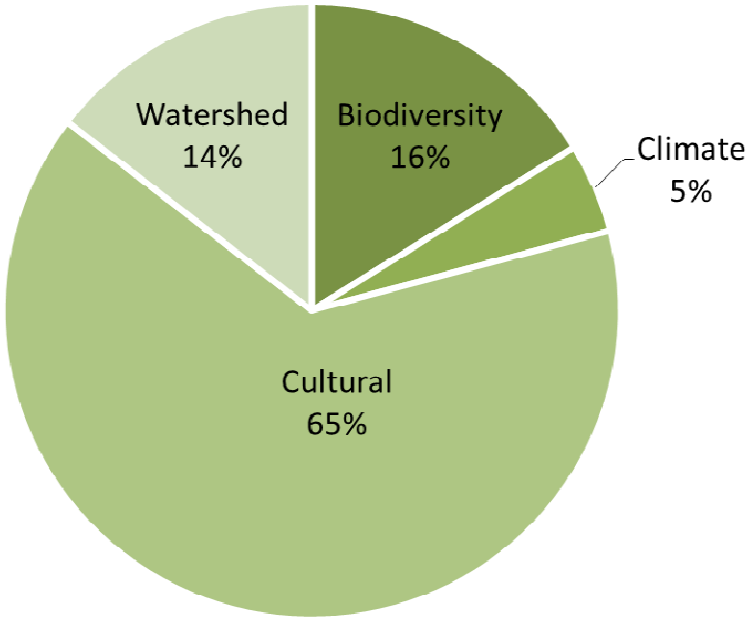
Results of Watershed Services

Water Capture	$0.5 billion
Water Filtration	$4.2 billion
Water Regulation	$8.5 billion
Total	**$13.2 billion**



Results of Forest Ecosystem Services

Biodiversity	$14.8 billion
Climate	$ 4.4 billion
Cultural	$60.4 billion
Watershed	$13.2 billion
Total	**$92.9 billion**



Media Coverage

- AP carried the story
- National Outlets
  - SAF, Forest Business Network, NASF
- Texas state agencies
  - Agrilife, TSSWCB
- Industry and trade association publications
- TFS Social Media
  - Facebook – 2 posts ~ 1,800 views
  - Twitter – 1 tweet resulted in 7 entities mentioning news; 29 others "*retweeted*" or "*favorited*"

Results Could Be Used to:

- Raise awareness of the importance of Texas forests
- Inform forest policy
- Support forest conservation efforts
- Evaluate changes in ecosystem service values following natural disasters and conservation programs
- Complement economic impact reports
- Provide regional template for conducting ES valuations
- Encourage enhanced forest management

TexasForestInfo.com Demonstration

Next Steps:

- Quantify and assess value of ecosystem services provided by trees in urban and community areas in Texas

Conclusion

Recognizing the value of forest ecosystem services is paramount to smart land use planning and the long-term sustainability of Texas forests.