National Aeronautics and
Space Administration

NASA earth

Using Remote Sensing to Estimate Groundwater – Surface Water Interaction

Barney Austin

Project Update – Q3

Earth Science Division

INTRODUCTION

Holy Grail: Measure flow in rivers from space, accurately

- Water is increasingly valuable!
- Need better monitoring for improved water resources management…especially where water is heavily used
- Quantify groundwater – surface water interaction

NASA products: SWOT, OPERA DSWx

Project Partners

Texas Water Development Board (Daryn Hardwick – Chairman)

International Boundary Water Commission (Gilbert Anaya)

Elephant Butte Irrigation District (Dr. Phil King)

NADBank (Fernando Ortiz)

World Wildlife Fund (Enrique Prunes)

Sustainable Waters (Brian Richter - tentative)

Delivery:

Process for downloading data
Methodology for estimating flow
Better water resources management/regulation

IMPACT

Real-time streamgages cost over $20,000 per year to operate

- 12,000 gages in the US

Streamgages need to be serviced regularly and “calibrated”

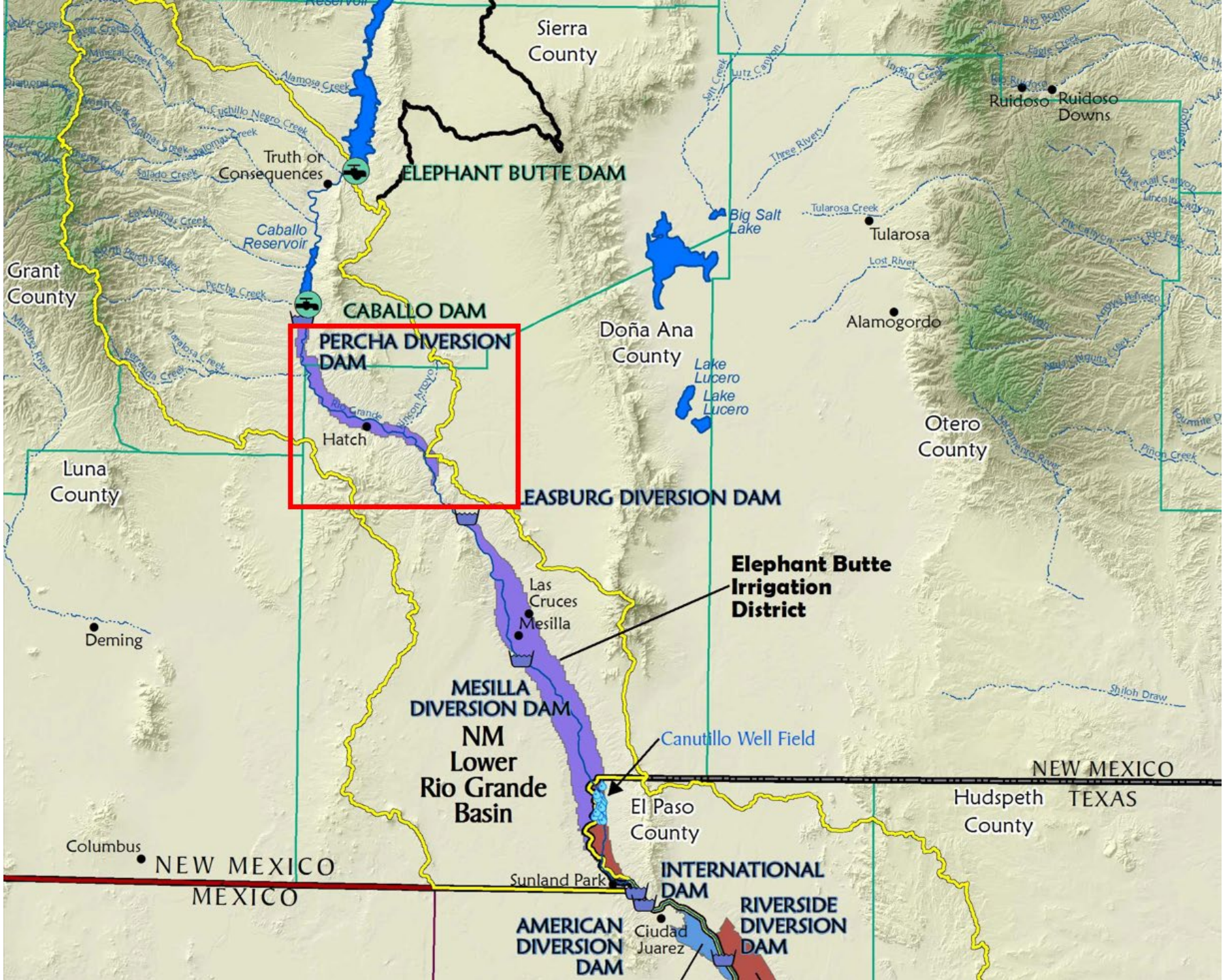
- Access, labor, etc…

Streamgages are used for point measurements of flow only

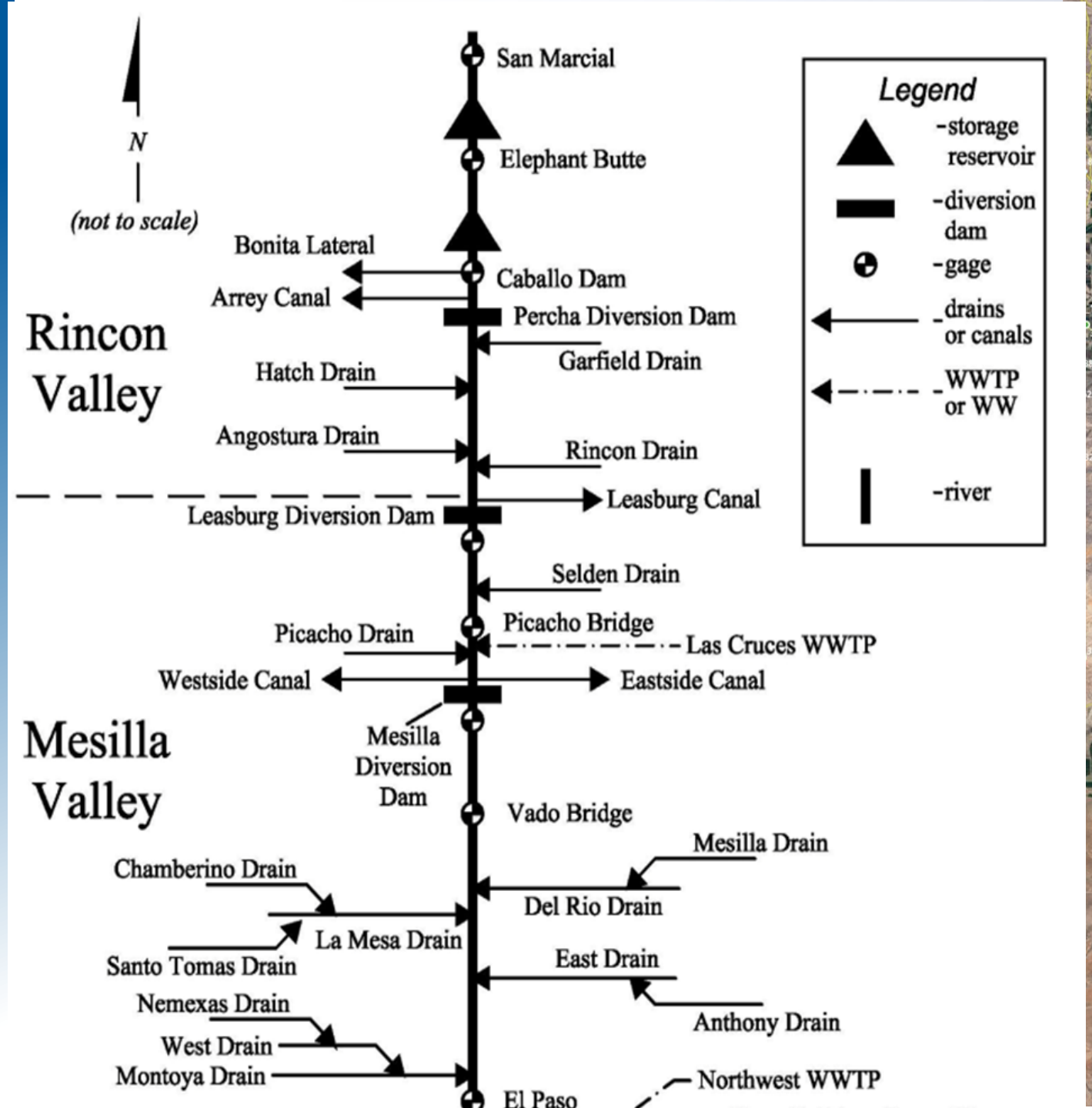
Huge potential to integrate with other remote sensing products

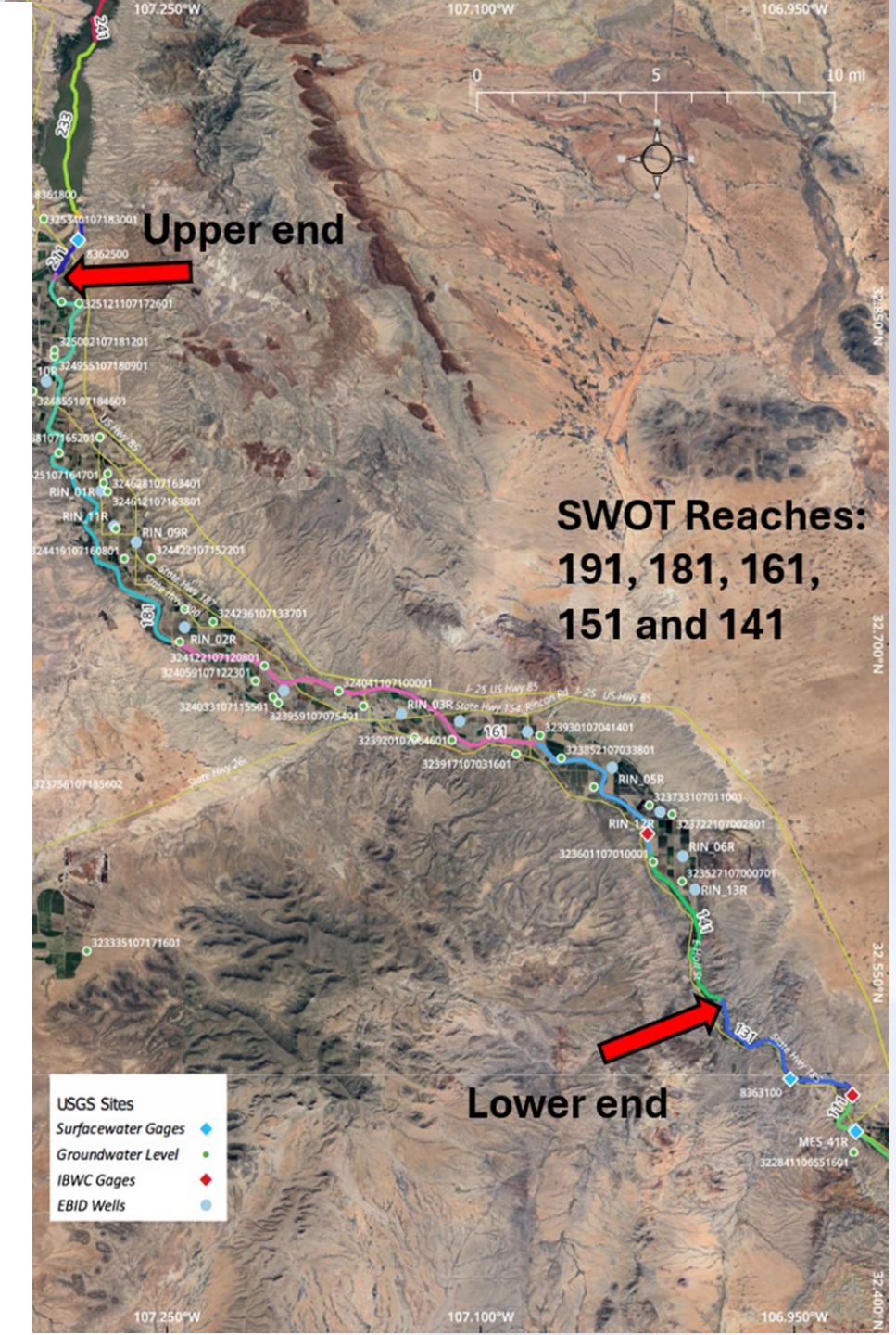
- Lake levels, soil moisture, groundwater levels, rainfall, evapotranspiration, etc.

Project Visuals!

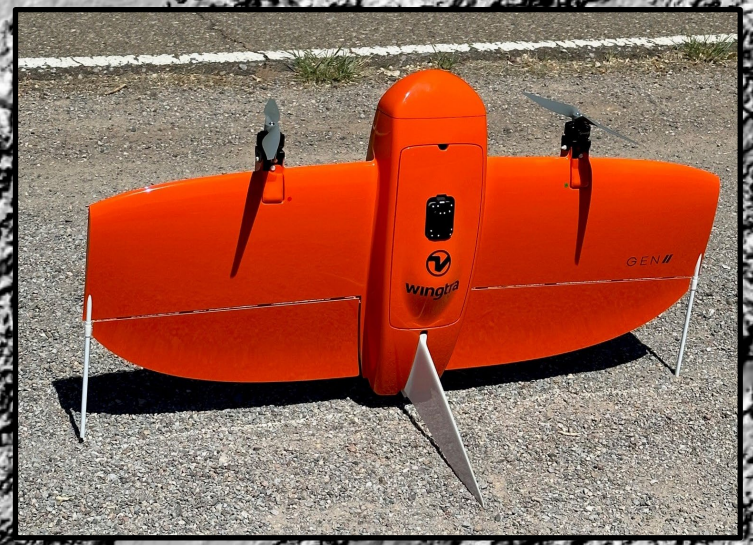

Sierra County
Truth or Consequences
ELEPHANT BUTTE DAM
Caballo Reservoir
Grant County
CABALLO DAM
PERCHA DIVERSION DAM
Hatch
Luna County
Deming
LEASBURG DIVERSION DAM
Las Cruces
Mesilla
Elephant Butte Irrigation District
MESILLA DIVERSION DAM
NM Lower Rio Grande Basin
Canutillo Well Field
El Paso County
Columbus
NEW MEXICO
MEXICO
Sunland Park
INTERNATIONAL DAM
AMERICAN DIVERSION DAM
Ciudad Juarez
RIVERSIDE DIVERSION DAM
NEW MEXICO
TEXAS
Hudspeth County
Doña Ana County
Big Salt Lake
Lake Lucero
Lake Lucero
Tularosa
Alamogordo
Otero County
Ruidoso
Ruidoso Downs

Plumbing


N
(not to scale)
San Marcial
Elephant Butte
Bonita Lateral
Caballo Dam
Arrey Canal
Percha Diversion Dam
Rincon Valley
Garfield Drain
Hatch Drain
Angostura Drain
Rincon Drain
Leasburg Canal
Leasburg Diversion Dam
Selden Drain
Picacho Drain
Picacho Bridge
Las Cruces WWTP
Westside Canal
Eastside Canal
Mesilla Valley
Mesilla Diversion Dam
Vado Bridge
Mesilla Drain
Chamberino Drain
Del Rio Drain
La Mesa Drain
Santo Tomas Drain
East Drain
Anthony Drain
Nemexas Drain
West Drain
Montoya Drain
Northwest WWTP
El Paso
Legend
-storage reservoir
-diversion dam
-gage
-drains or canals
-WWTP or WW
-river


Upper end
SWOT Reaches:
191, 181, 161,
151 and 141
Lower end
USGS Sites
Surfacewater Gages
Groundwater Level
IBWC Gages
EBID Wells

Digital Elevation Model (Drone)



Pressure Transducers installed

Q&A

Barney Austin
baustin@hazenandsawyer.com
(512) 826-2604

NASA

NASA earth

science.nasa.gov/earth

Your Home. Our Mission.