

Evaluating the Efficacy of the Edwards Aquifer Protection Program

Meeting of the City of San Antonio
Conservation Advisory Board
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F. Paul Bertetti, P.G.
Director – Aquifer Science

It is important to quantitatively assess the EAPP

- Represents a large investment of local resources
 - Continued high interest and support from the public
 - Need to be able to provide estimates of past effectiveness and future investment
-
- Some previous efforts to assess the program have lacked strong technical bases for conclusions

A new approach

- SwRI and EAA have developed a proposed assessment methodology that can address some of the deficiencies of previous efforts to quantify the effectiveness the EAPP

SwRI: Kindra Nicholaides, Gordon Wittmeyer, Ph.D., Ronald Green, Ph.D., P.G.

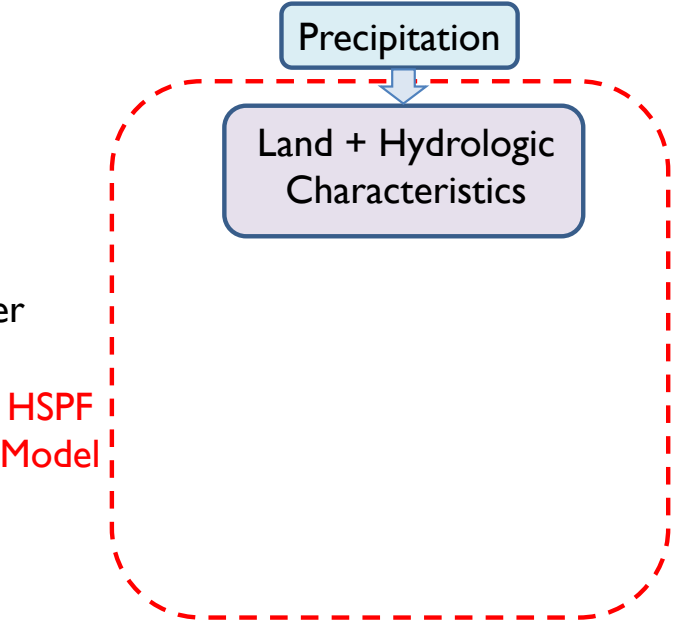
- Uses a geographic information systems (GIS) tool that is informed by existing watershed models
- Leverages knowledge from coupled groundwater-surface water modeling in the region

A watershed model
previously funded and
developed by EAA to
evaluate alternative
recharge calculations is
used to generate a water
balance

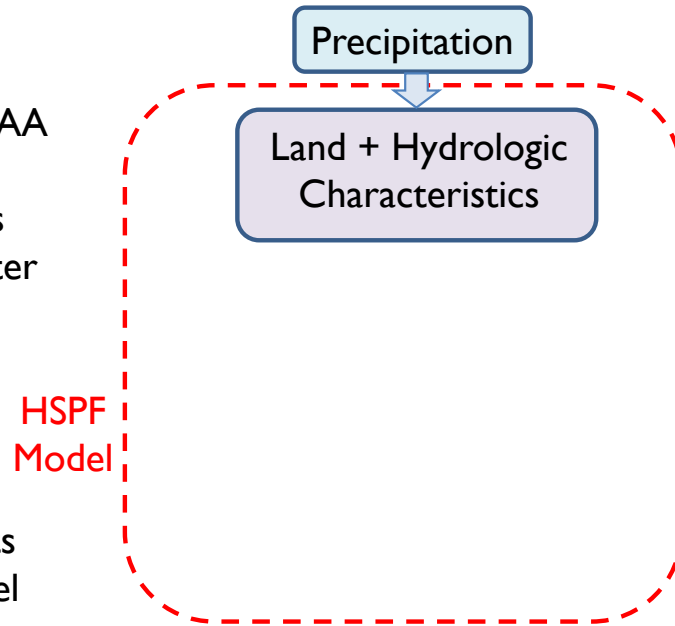
HSPF
Model

Hydrologic Simulation
Program – Fortran
(HSPF)

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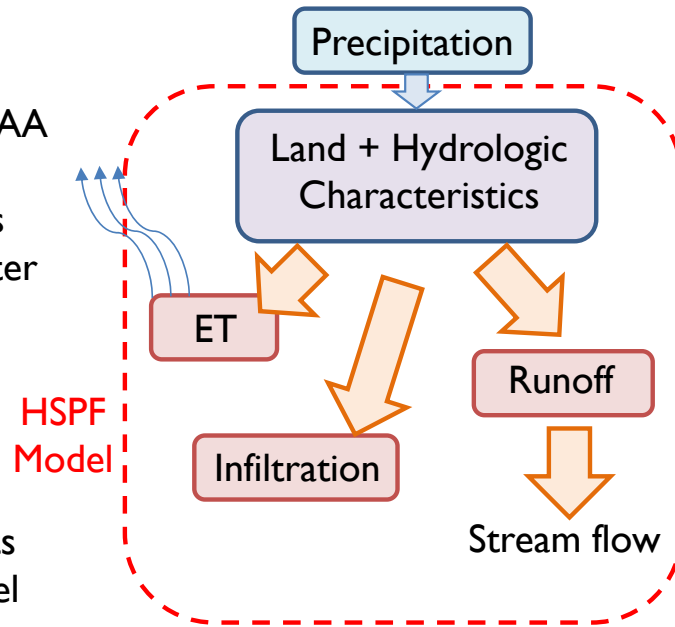


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The three main outputs of the watershed model are (i) ET losses, (ii) runoff, which eventually becomes stream flow, and (iii) infiltration

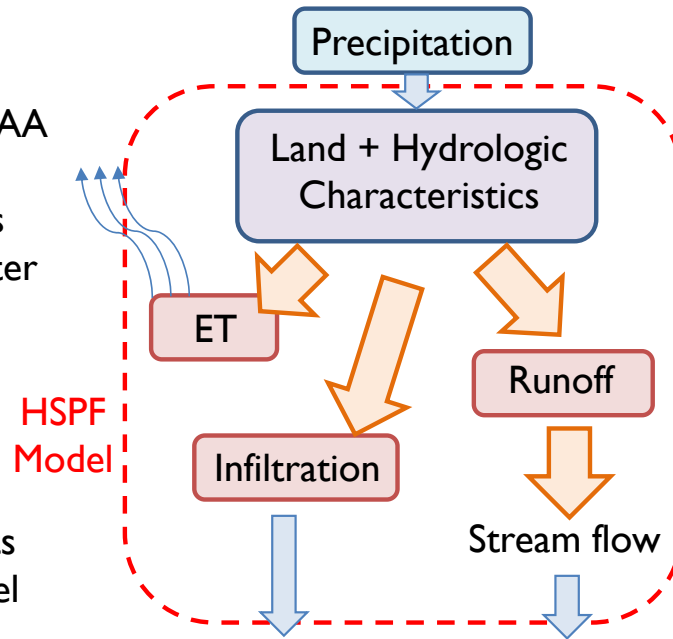
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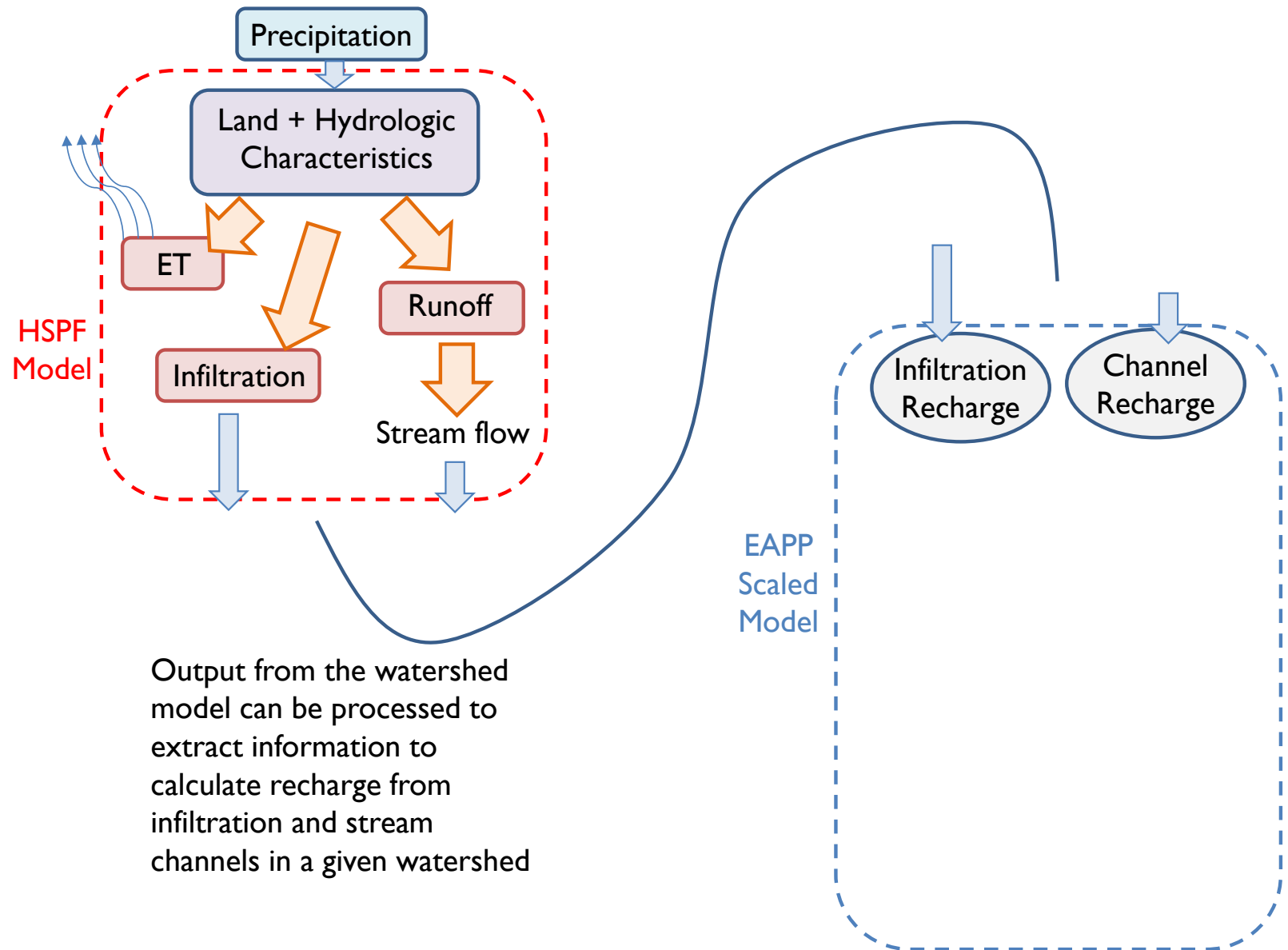
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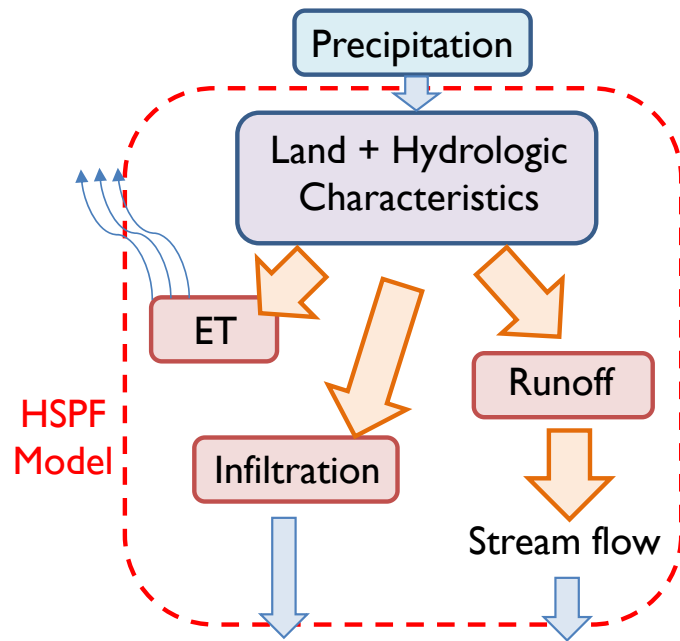
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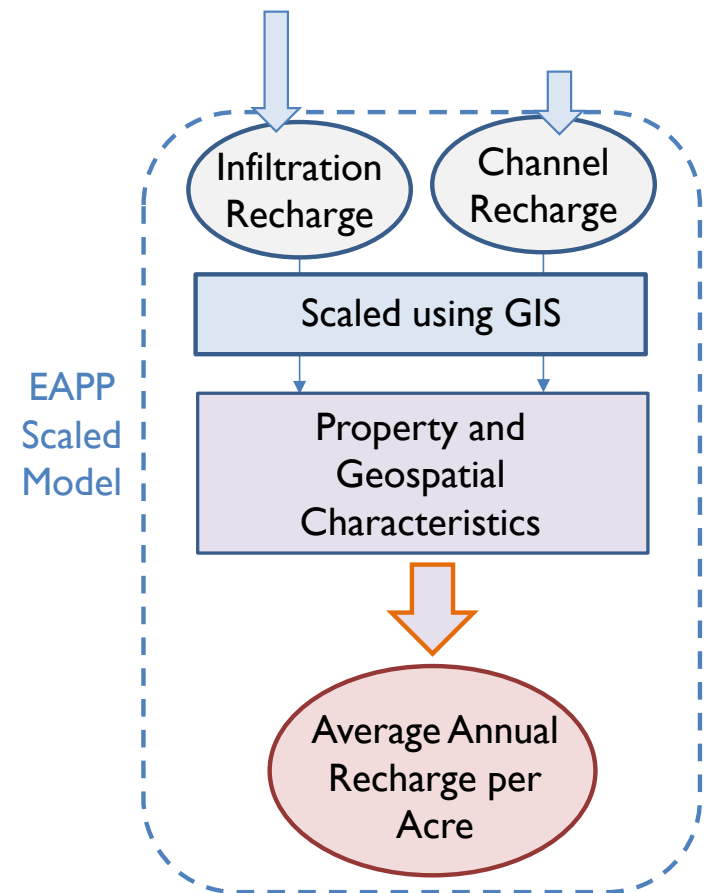


Output from the watershed model can be processed to extract information to calculate recharge from infiltration and stream channels in a given watershed



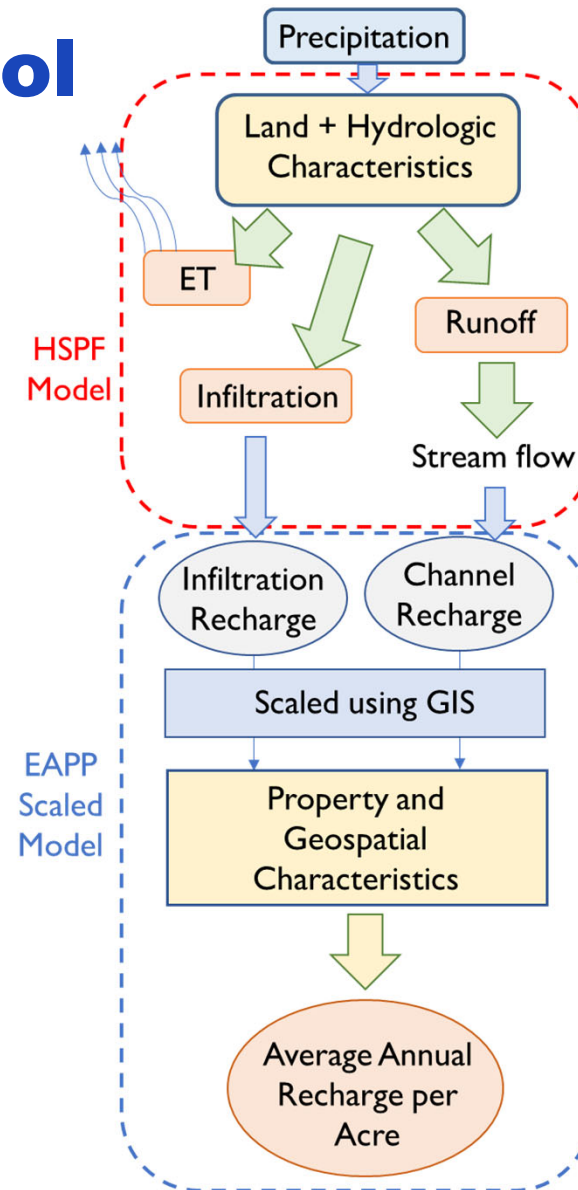


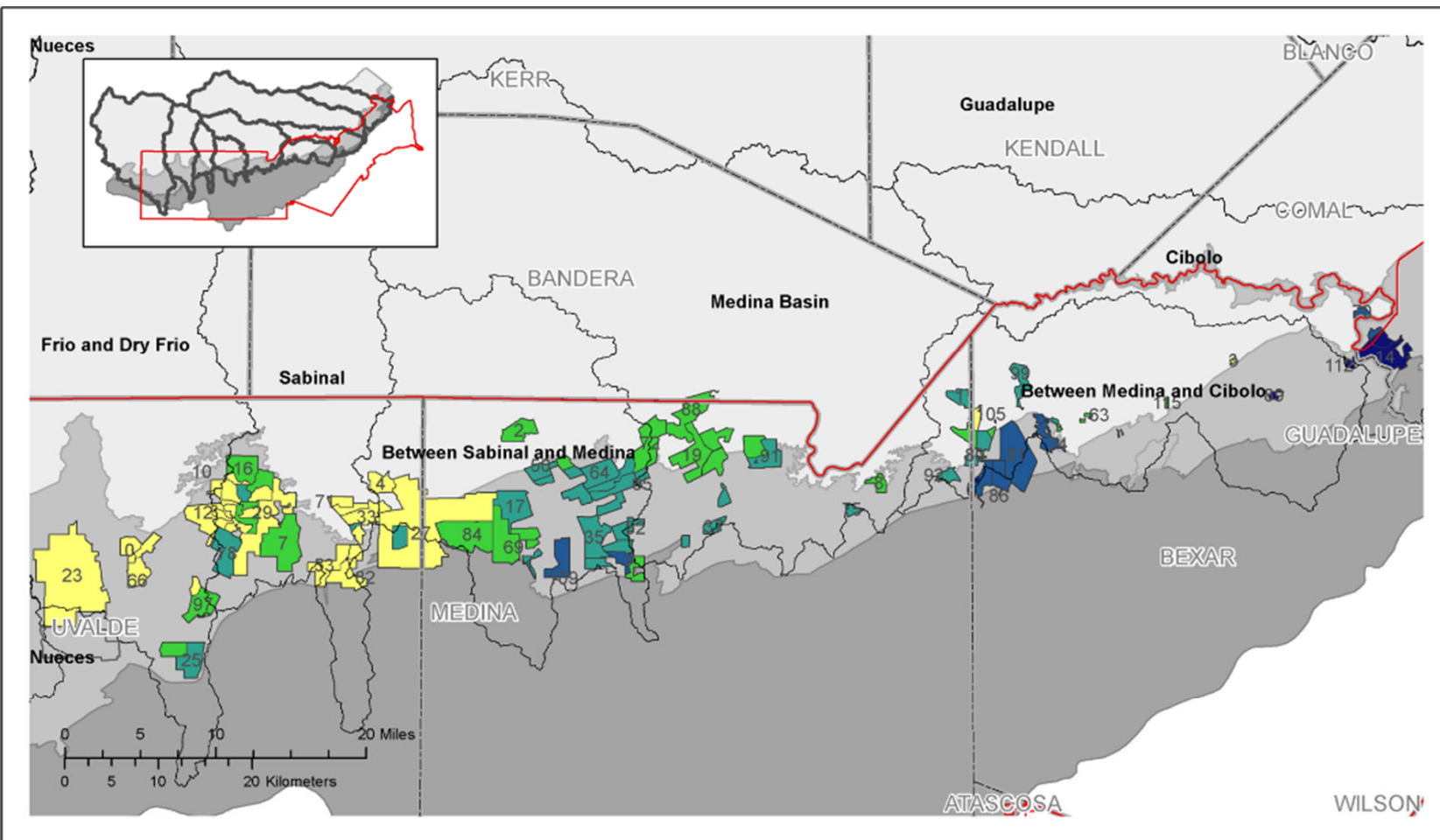
Spatial location, area, and other information are then used to calculate average annual recharge per acre for each property/easement



The EAPP assessment tool

- Recharge per acre can be used with cost and other factors to assess efficacy or guide future acquisitions
- Components of the model can be adjusted
- GIS integration can complement current EAPP tools (e.g., SET GIS model)
- The approach utilizes existing technology
- A model was developed in late 2020 to evaluate the feasibility of the approach





EAA Jurisdiction



9 HSPF Basins



Average Annual Recharge per Acre



LOWER

HIGHER

Aquifer Zones

Artesian Zone

Drainage Area

Recharge Zone

The results from the feasibility study

- Approach can be applied at the property scale
- Enough difference in “property performance” to make model effort worthwhile
- Still some technical challenges to overcome
- Many related applications – look back or look forward

Path Forward

- We propose development of a full model/tool
- Will include all EAA-related basins east to west
- Will incorporate/leverage information from other modeling efforts
 - Coupled model development in Blanco River basin
 - Calibration and conversion to “new” HSPF code used as part of EAA’s climate change assessment
 - Compatible or inclusive of many SET GIS model features
- Approximately 18 to 24 months to complete
- Cooperatively funded