

## APPENDIX II

### ELECTRONIC ONLY (CD ATTACHED)

#### ANN STREAM-AQUIFER INTERACTION MODELING PERFORMANCE EVALUATION

The trained artificial neural network (ANN) predictions are compared at several levels with the modeled values. This appendix contains the MATLAB-based reports for the performance analysis of the four ANN trained to model the stream-aquifer interaction in the LARV. The *Scenario*, *Region* and *Output* textboxes in the reports display the analysis level type. Statistics are calculated for the visible data in the form. Full exploration and analysis of the results can be achieved using the interactive user-controlled MATLAB reports that allow zooming, panning, analysis level control (regions, output variables, scenarios, etc...), printing and more. The reports are triggered using the MATLAB functions *Simulation.m*, *guivalvalidationL.m* and *guiGWReturnCmp.m*, included on the media CD – ANN training files<sup>c</sup>.

#### AQUIFER-ARKANSAS RIVER INTERFACE MODELING

##### **All\_Scen\_GWR\_v8BArk\_b Overall and Baseline Predictions Analysis**

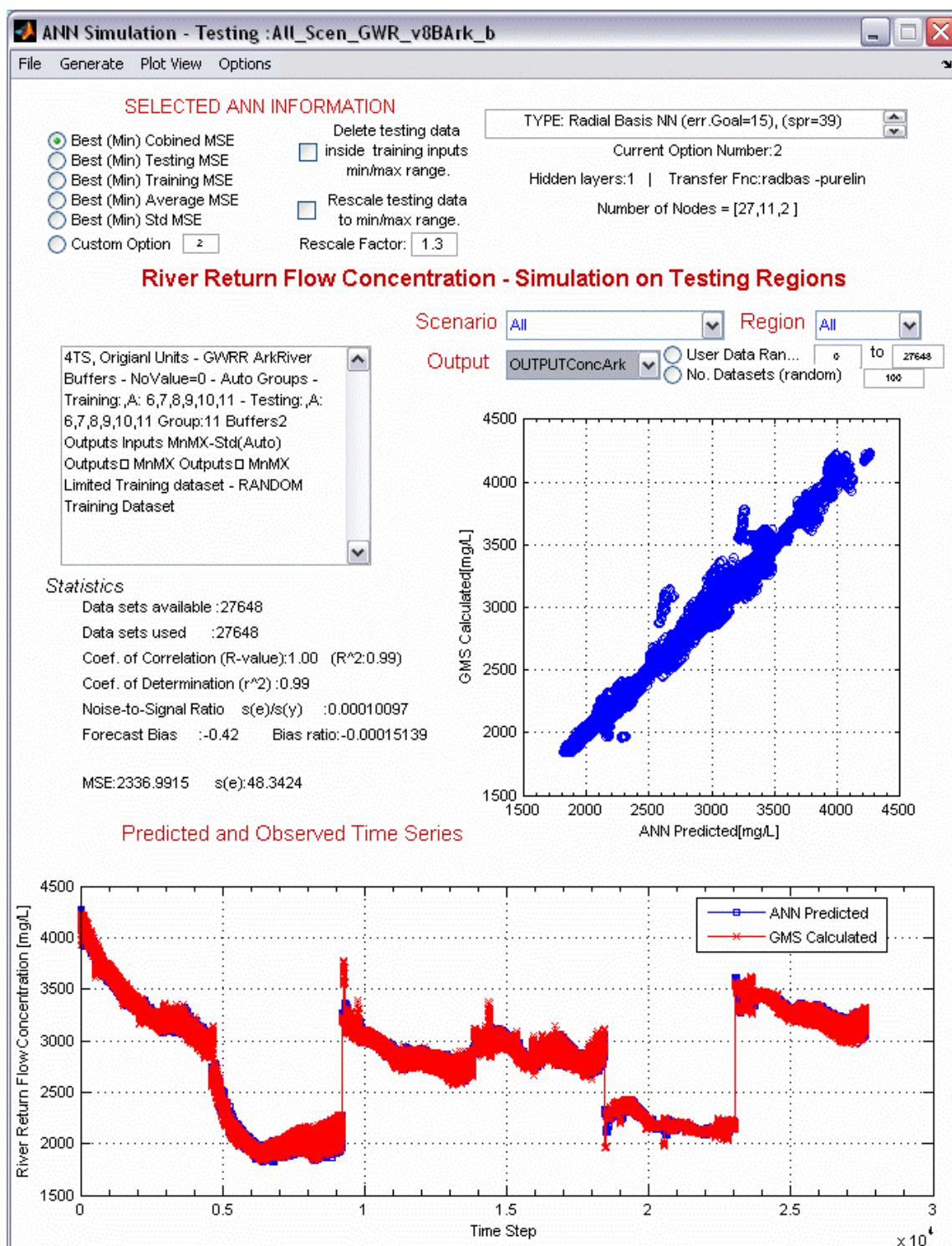
The following MATLAB-based reports correspond to the *All\_Scen\_GWR\_v8BArk\_b* ANN predictions analysis for different levels of testing data.

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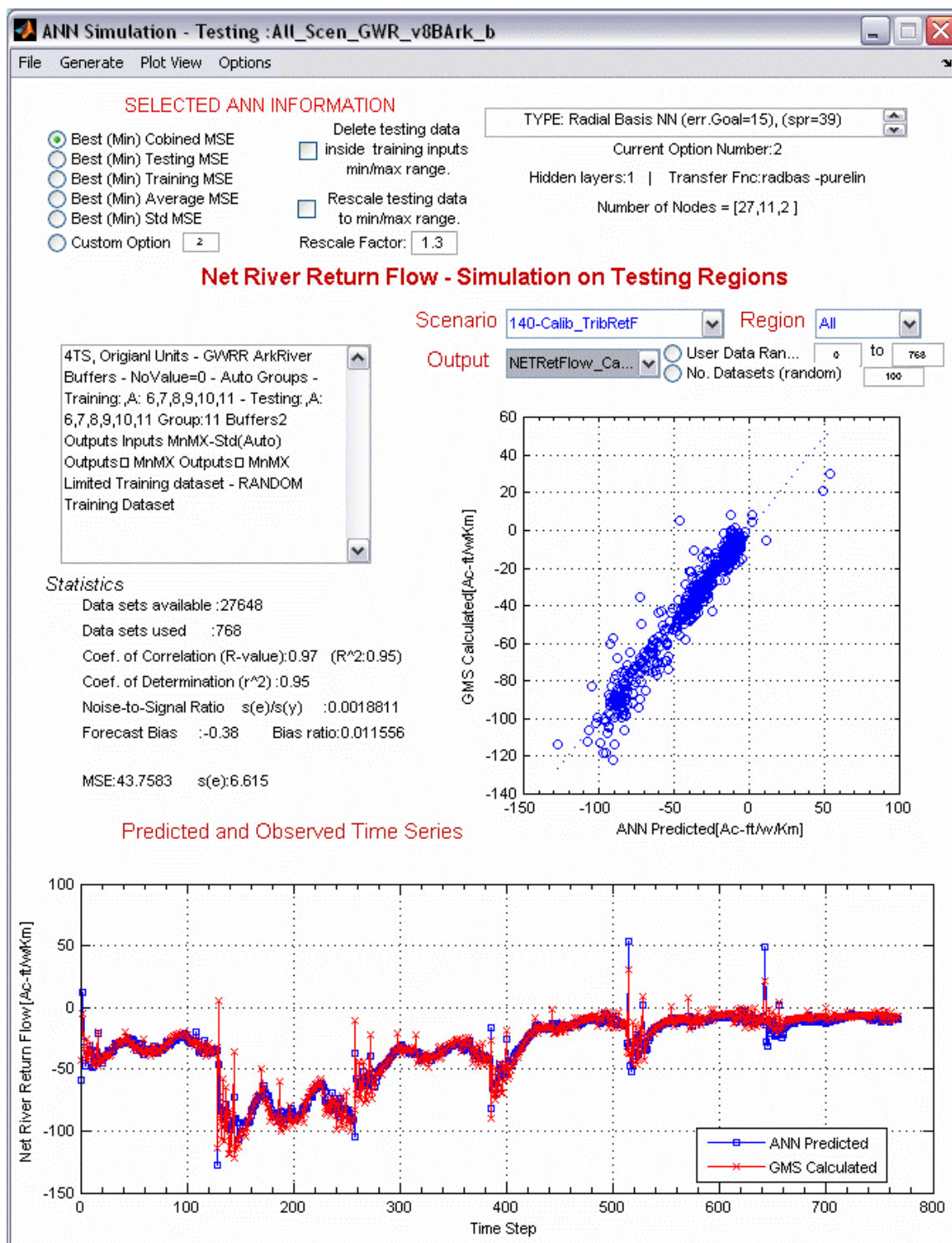
<sup>c</sup> These MATLAB files and the ANN training files are Included on the appended media CD



## Arkansas River – Stream-Aquifer Interaction Modeling

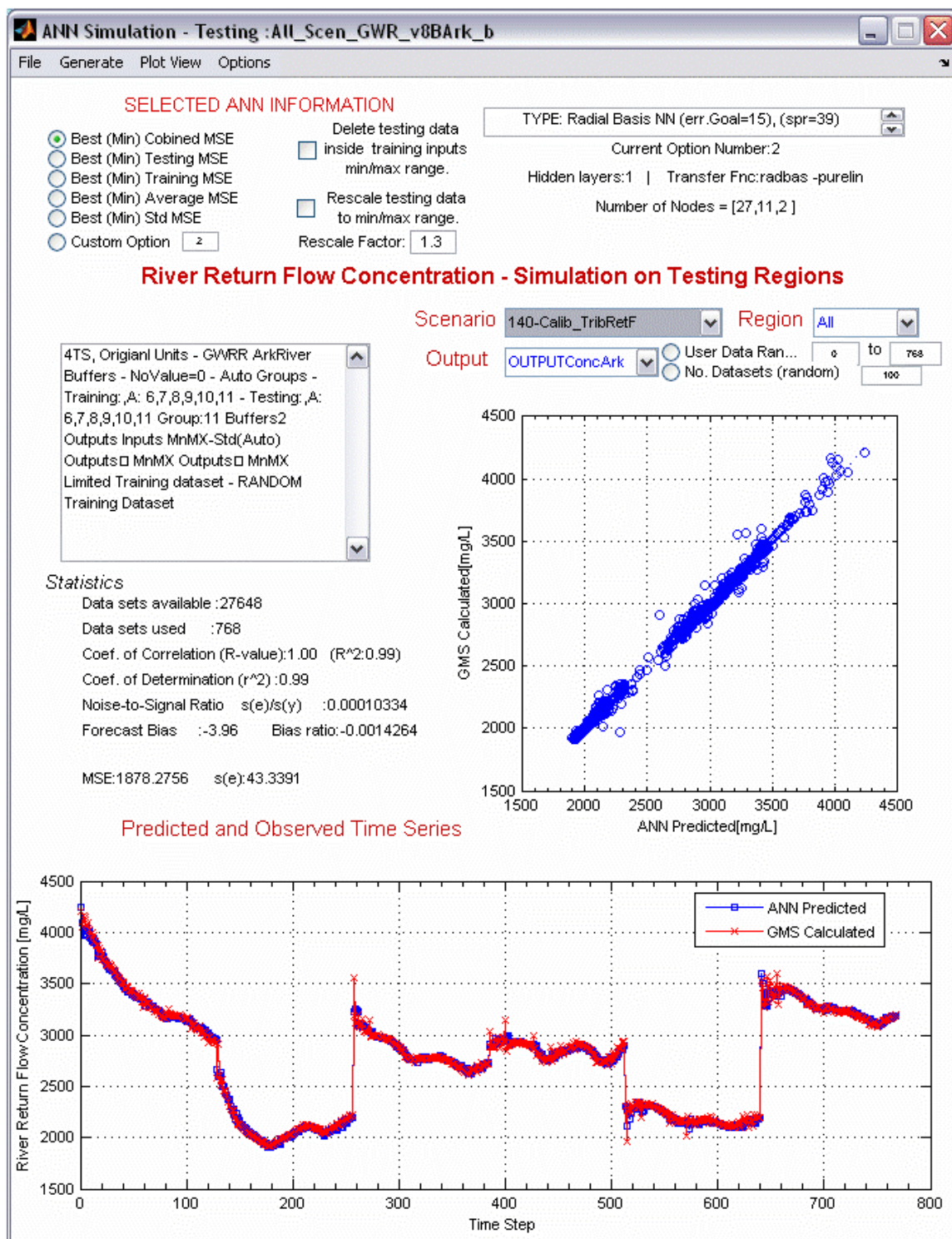


## Arkansas River – Stream-Aquifer Interaction Modeling

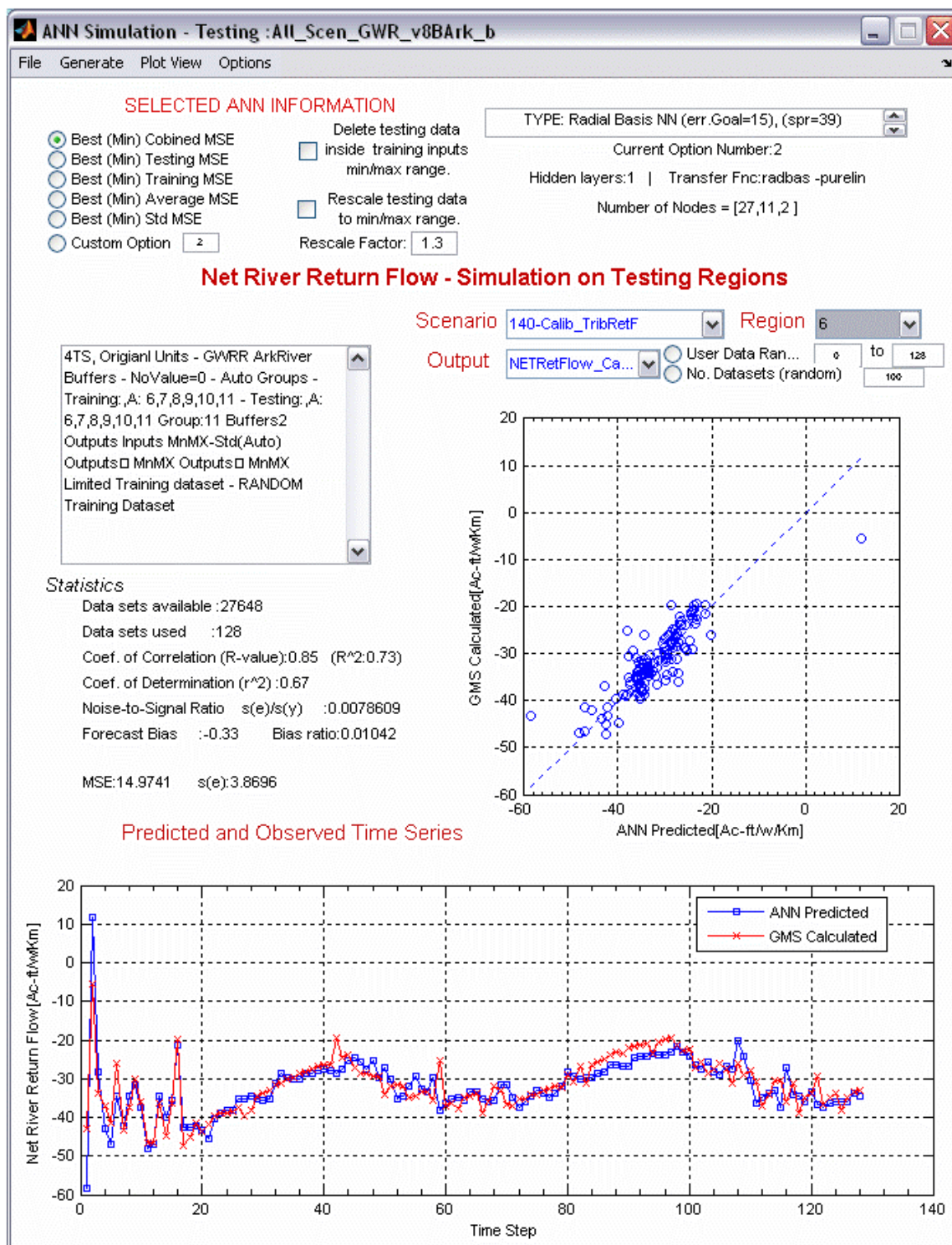




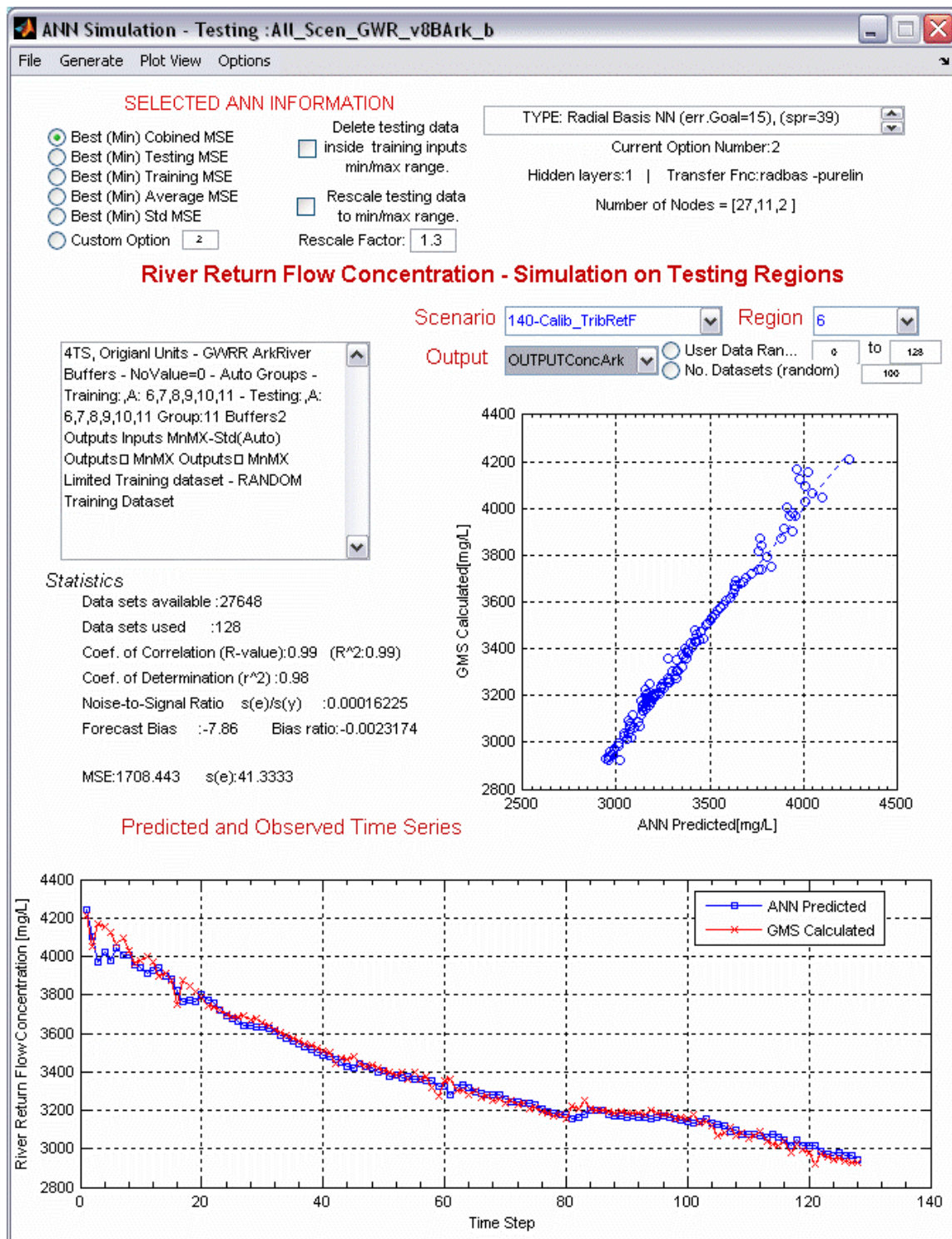
## Arkansas River – Stream-Aquifer Interaction Modeling



## Arkansas River – Stream-Aquifer Interaction Modeling

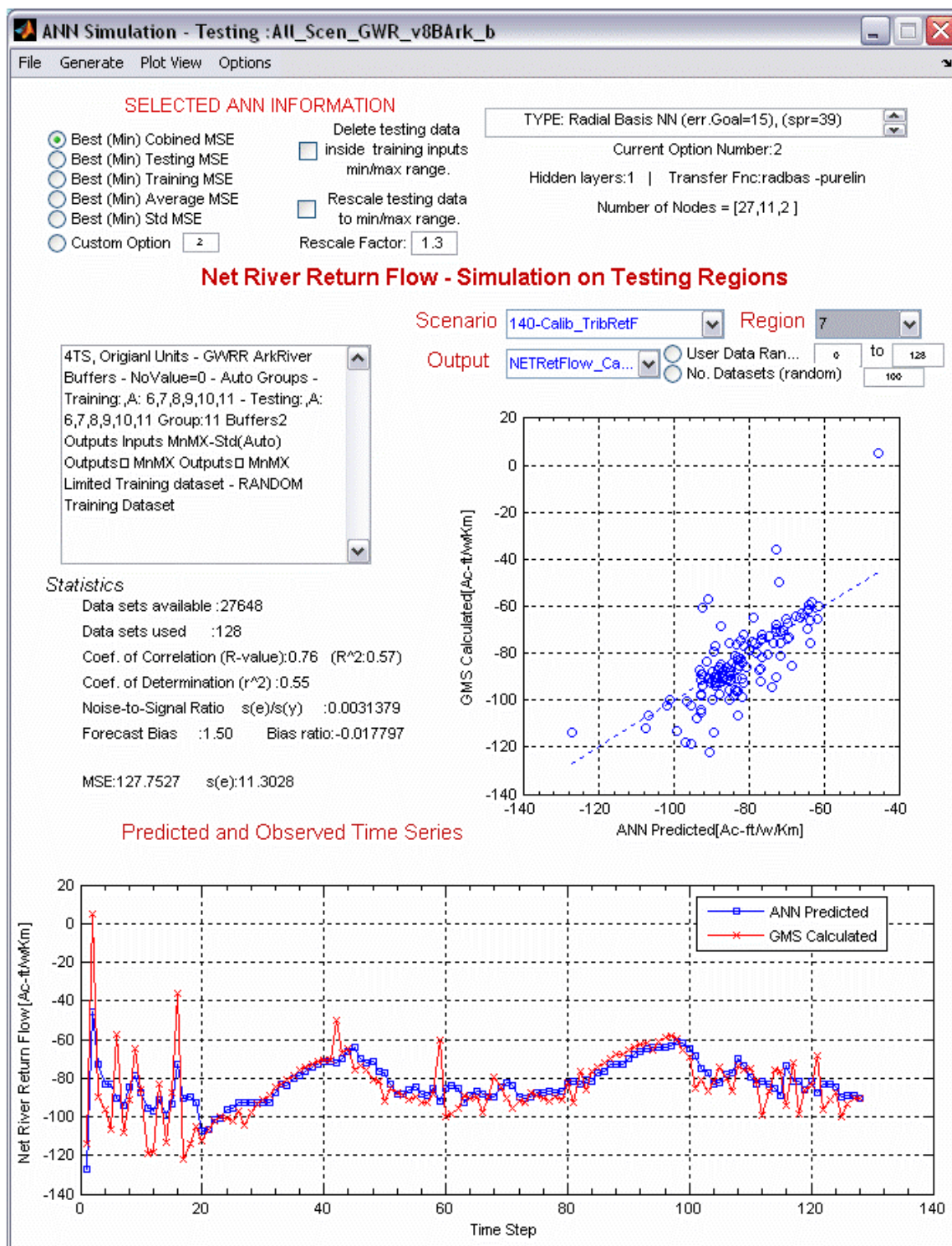


## Arkansas River – Stream-Aquifer Interaction Modeling



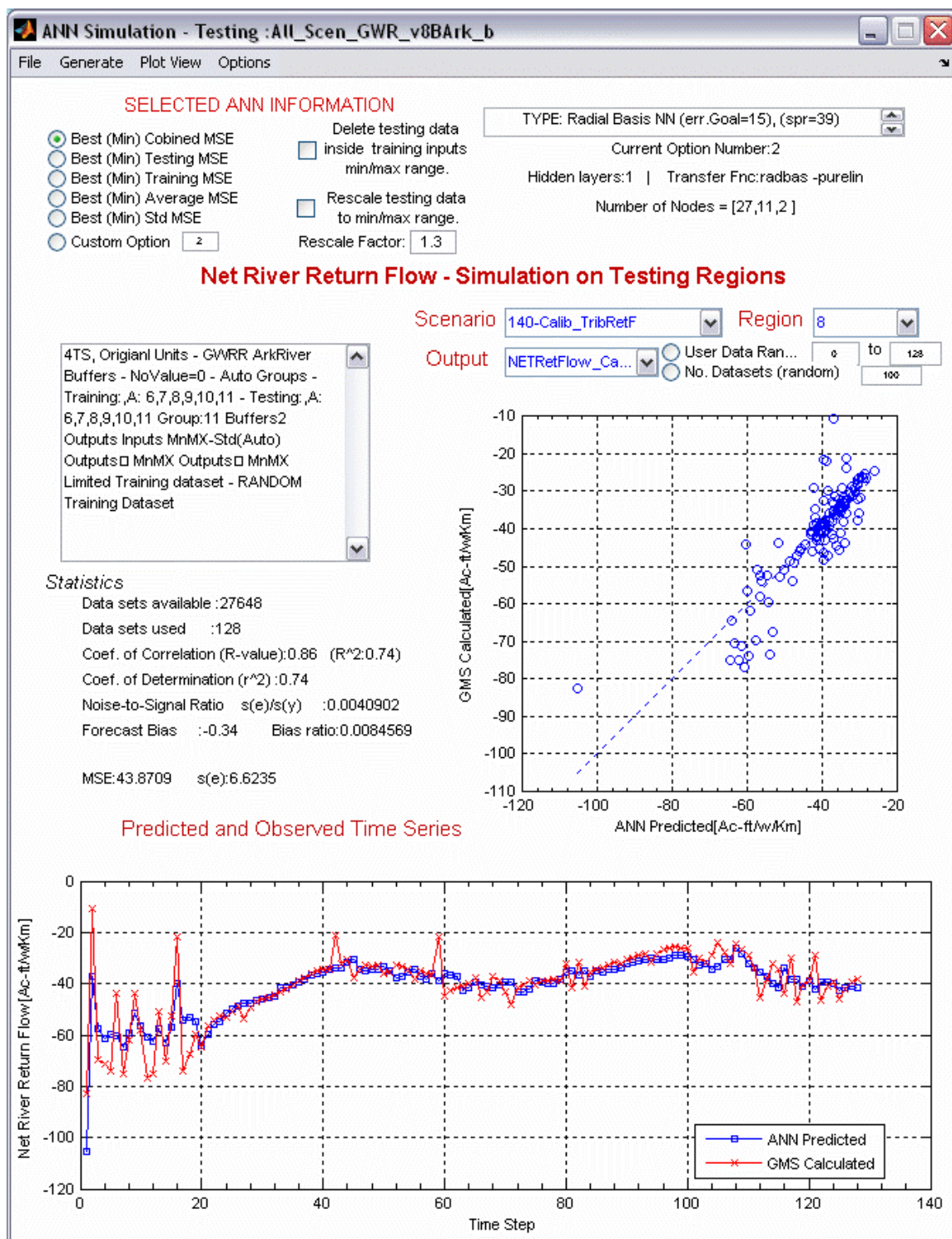


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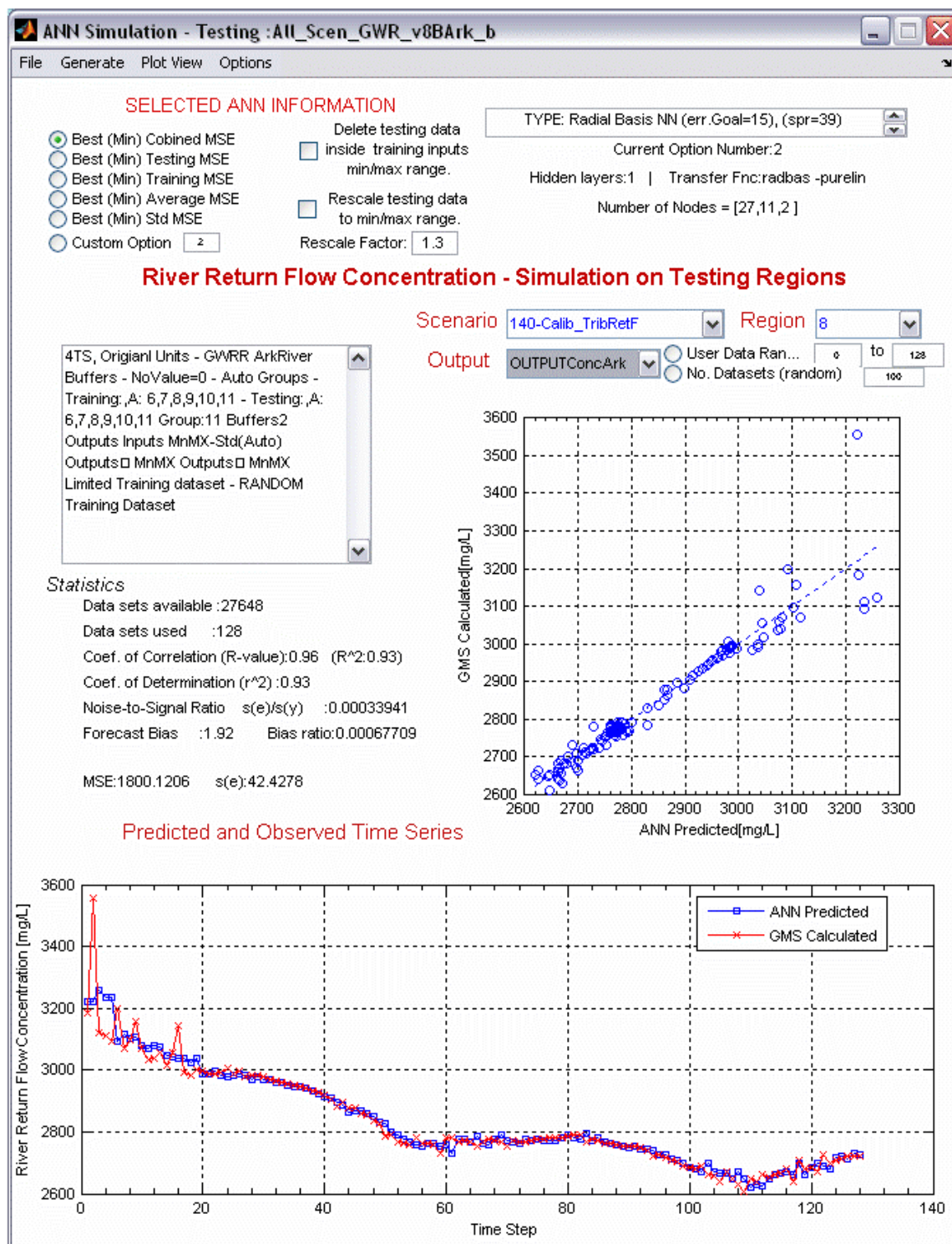




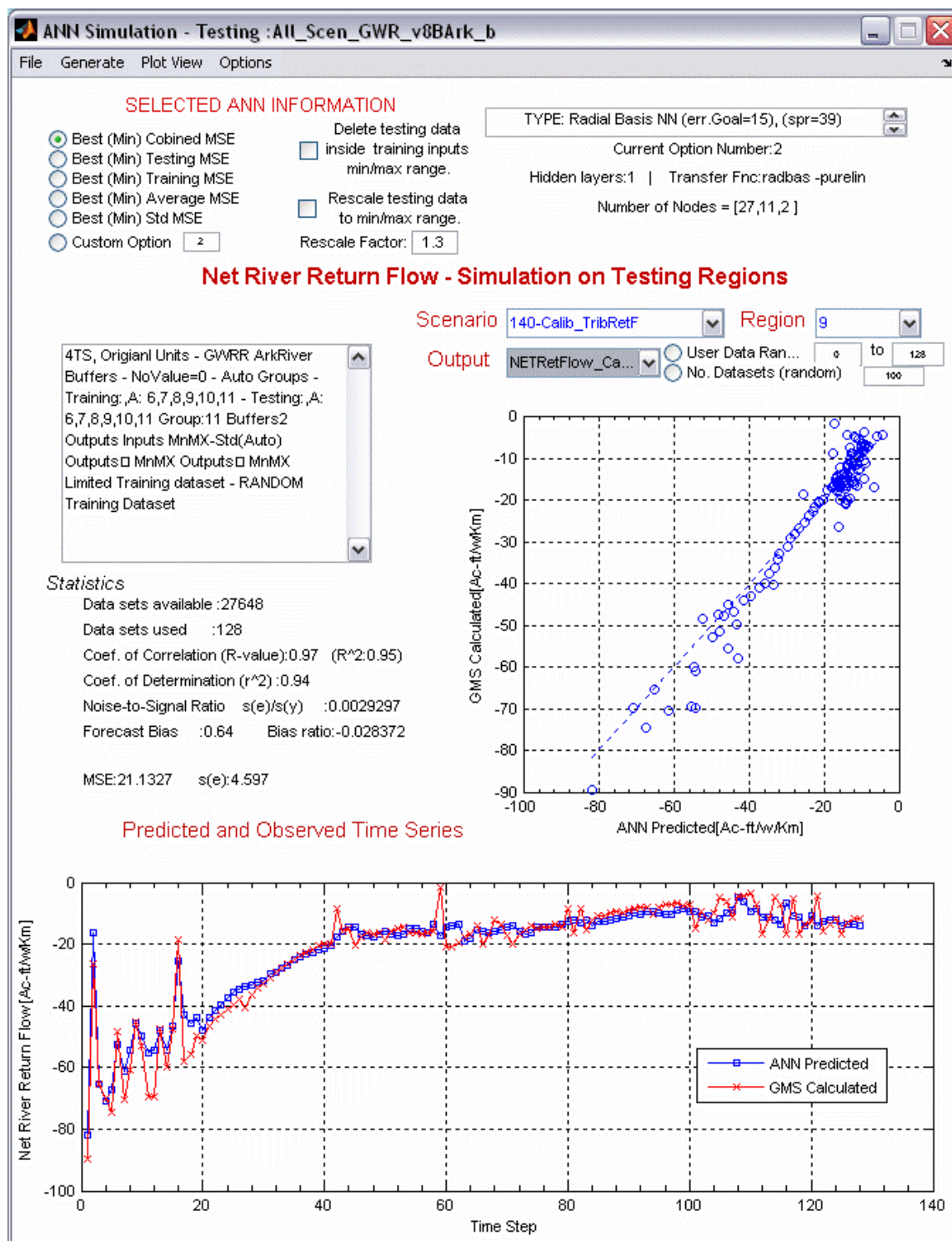
## Arkansas River – Stream-Aquifer Interaction Modeling



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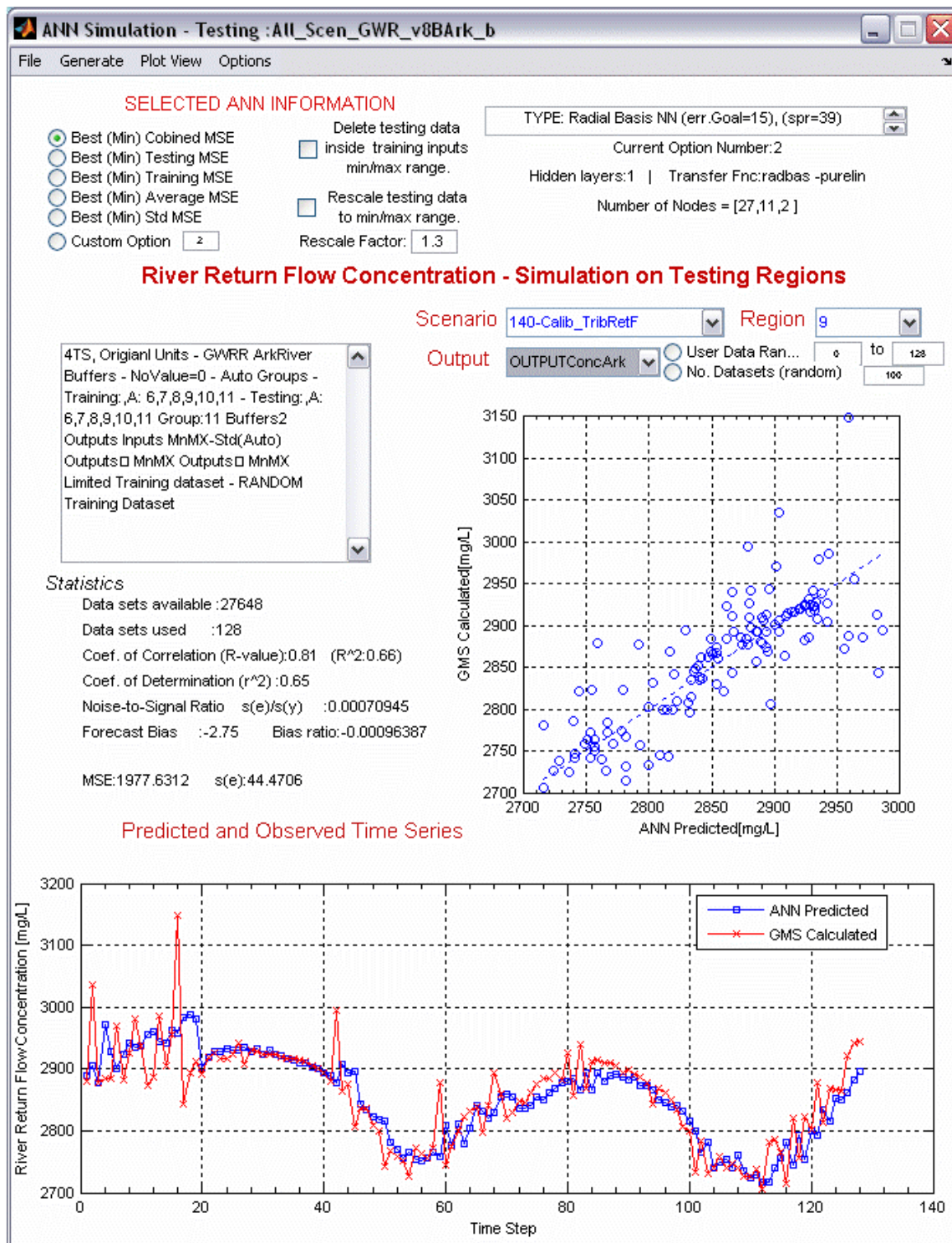


## Arkansas River – Stream-Aquifer Interaction Modeling

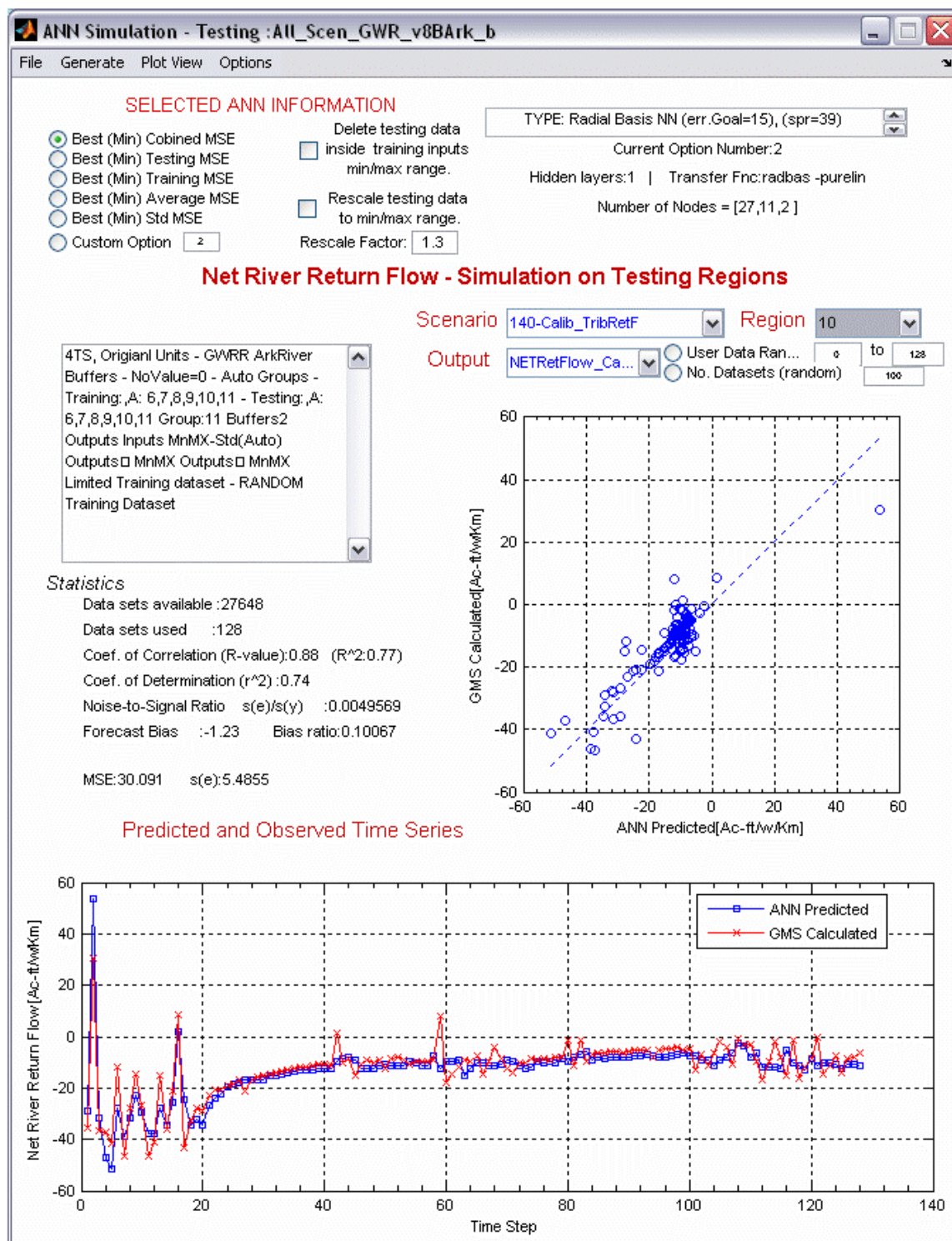




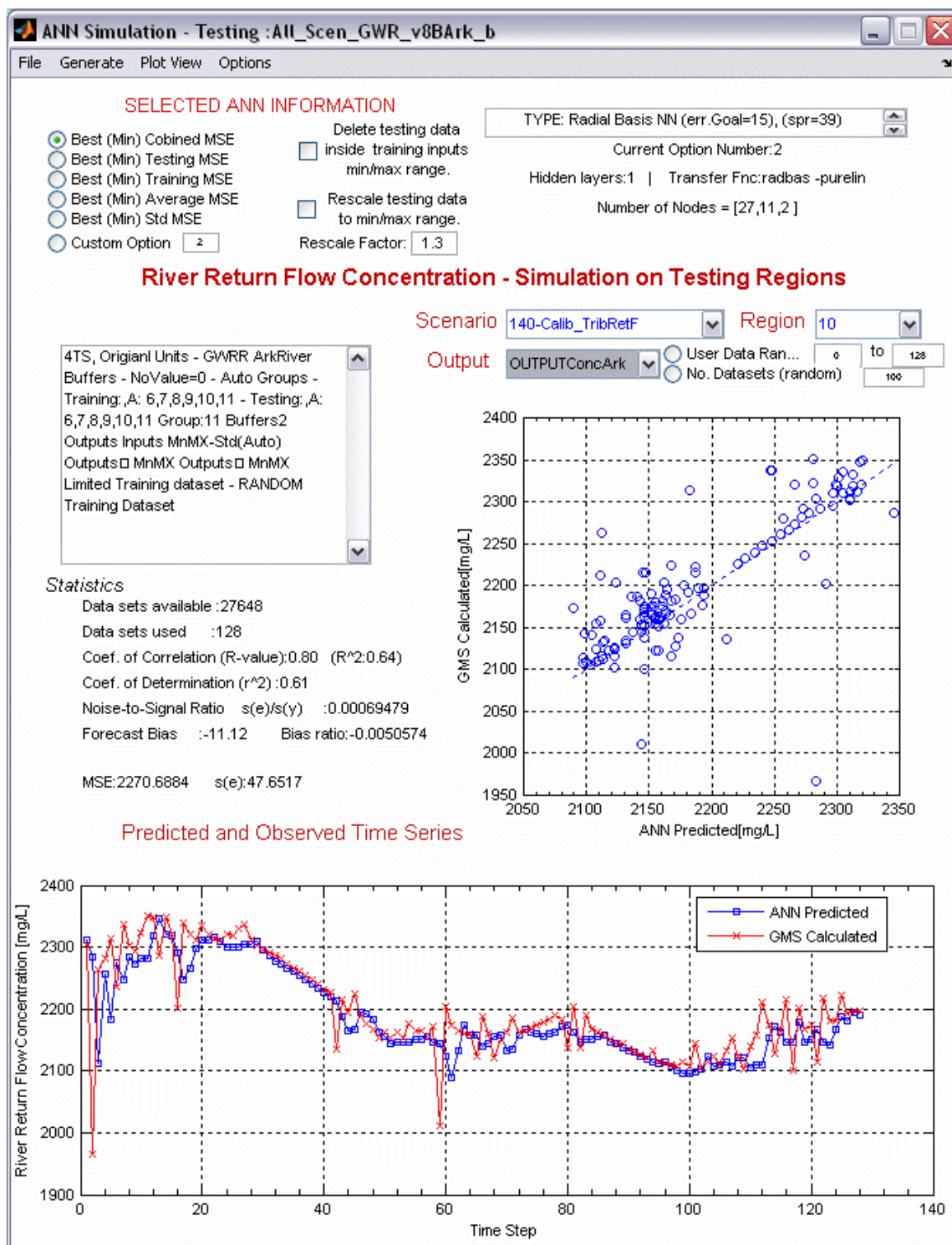
## Arkansas River – Stream-Aquifer Interaction Modeling



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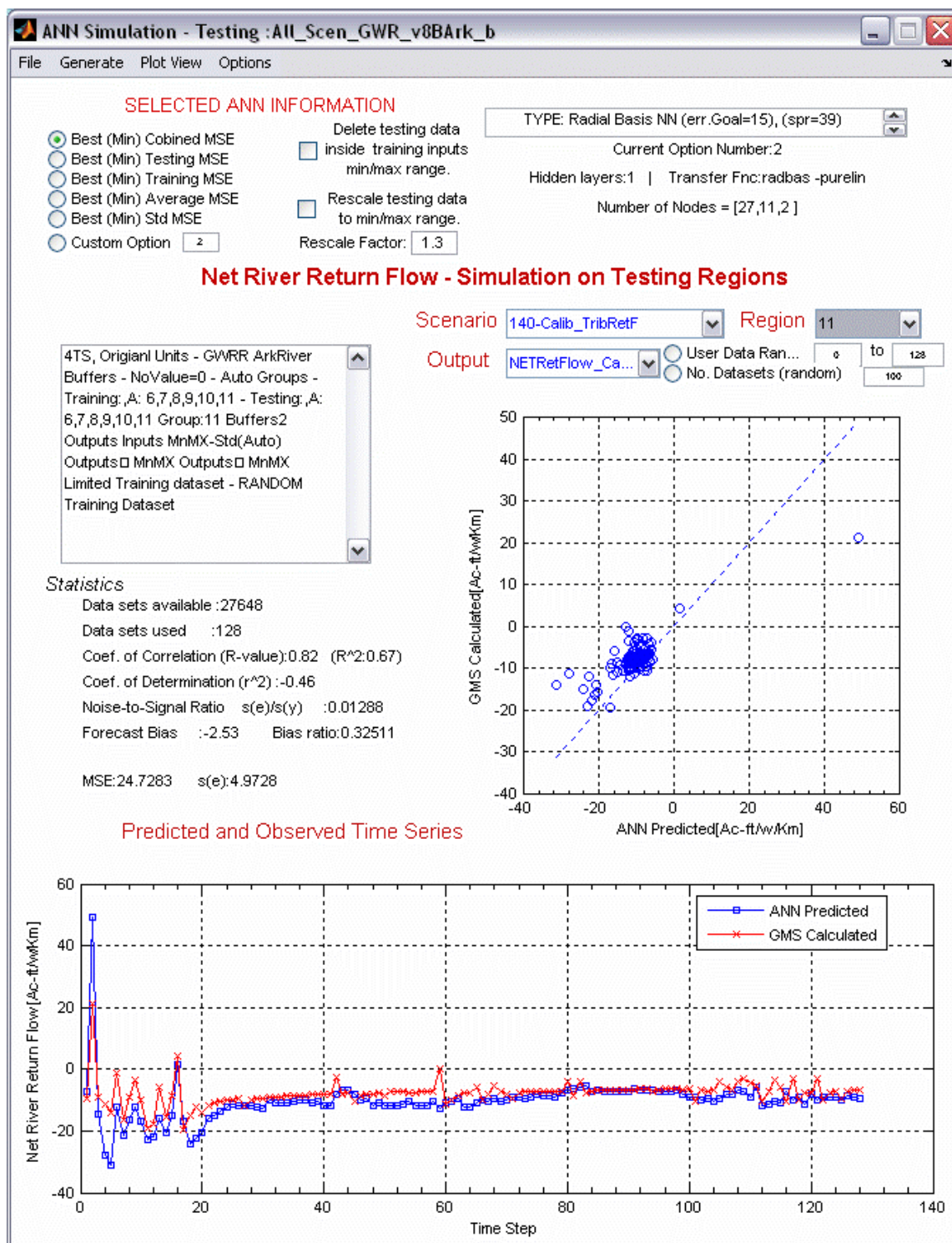


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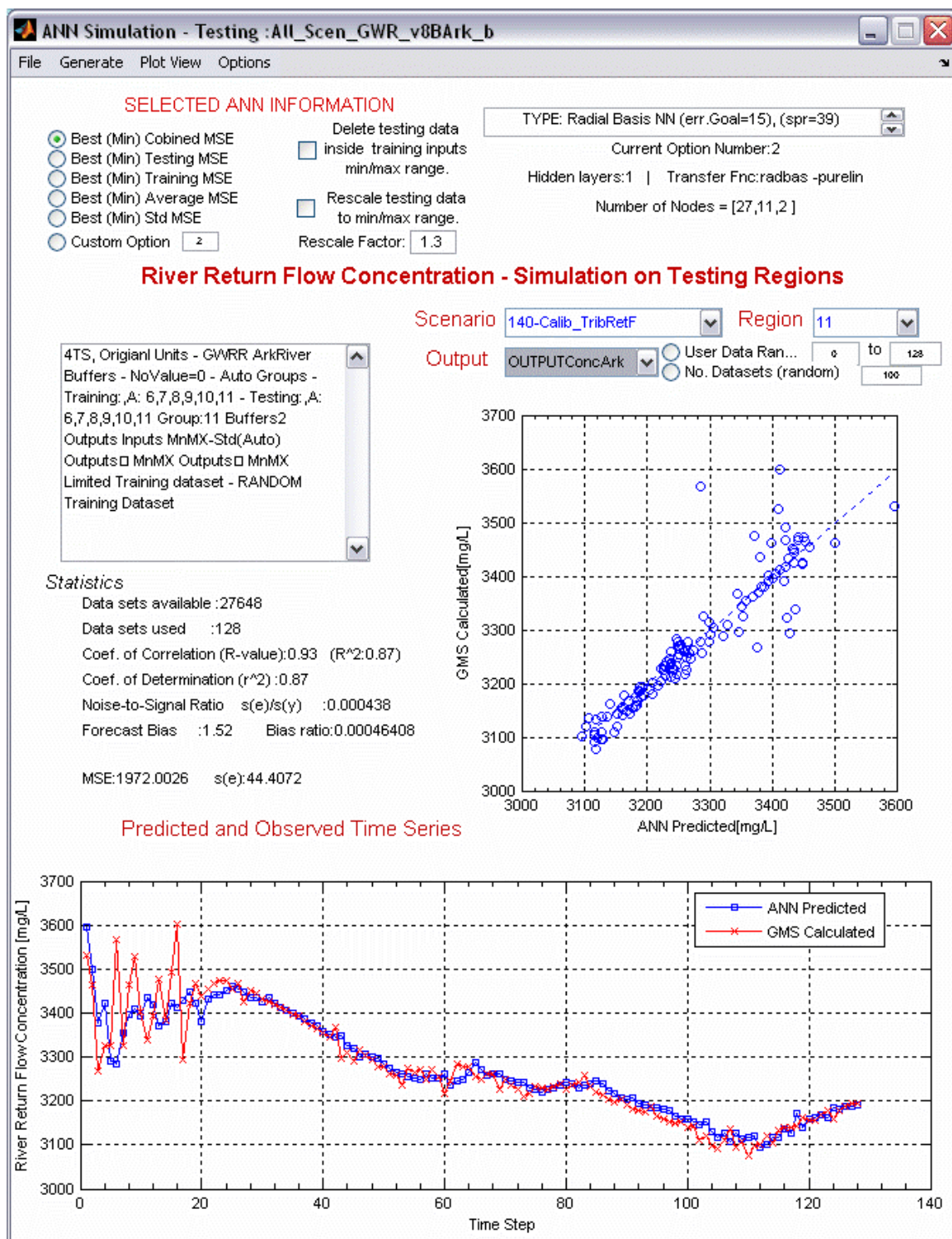




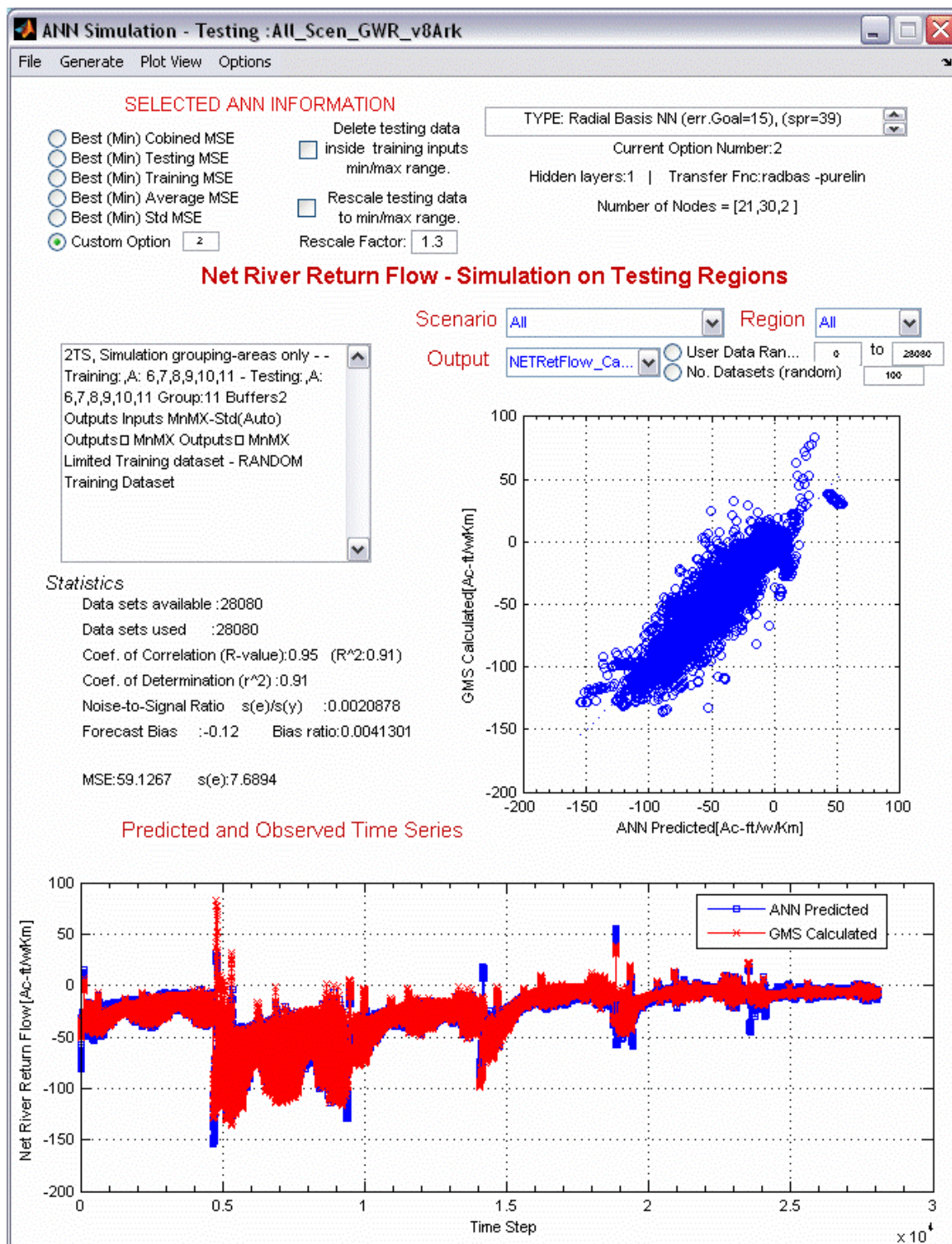
## Arkansas River – Stream-Aquifer Interaction Modeling



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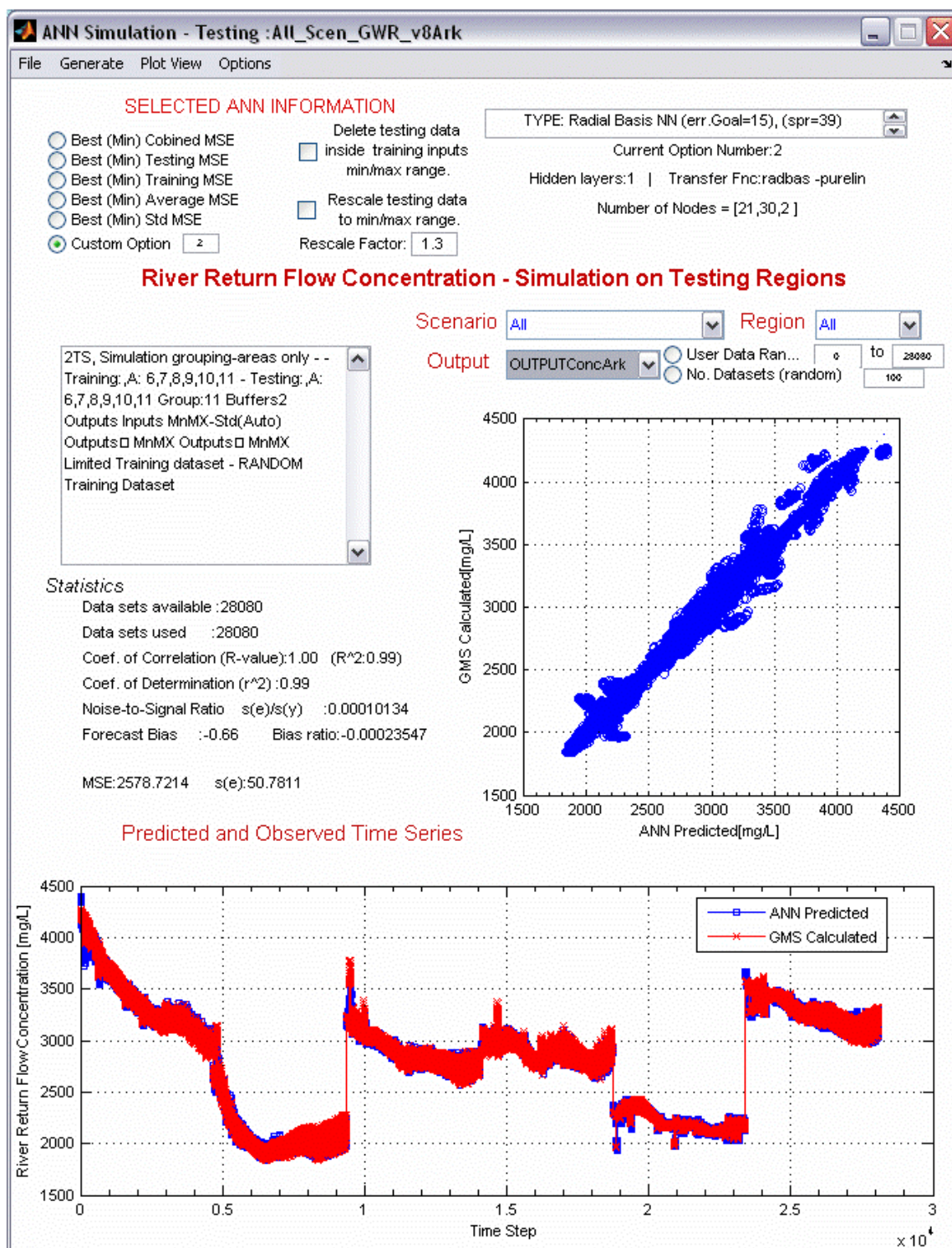
## Arkansas River – Stream-Aquifer Interaction Modeling



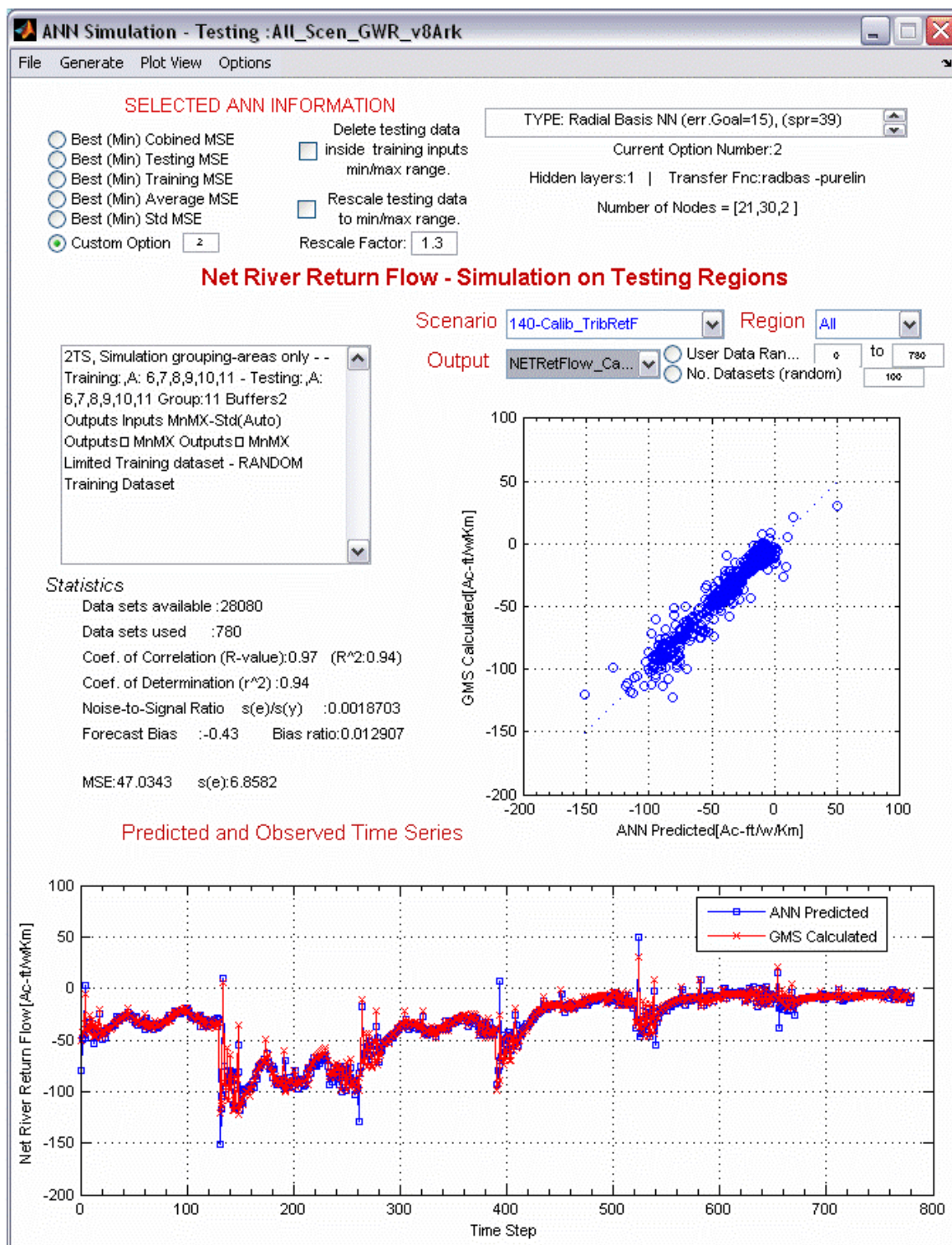


## All\_Scen\_GWR\_v8Ark Overall and Baseline Predictions Analysis

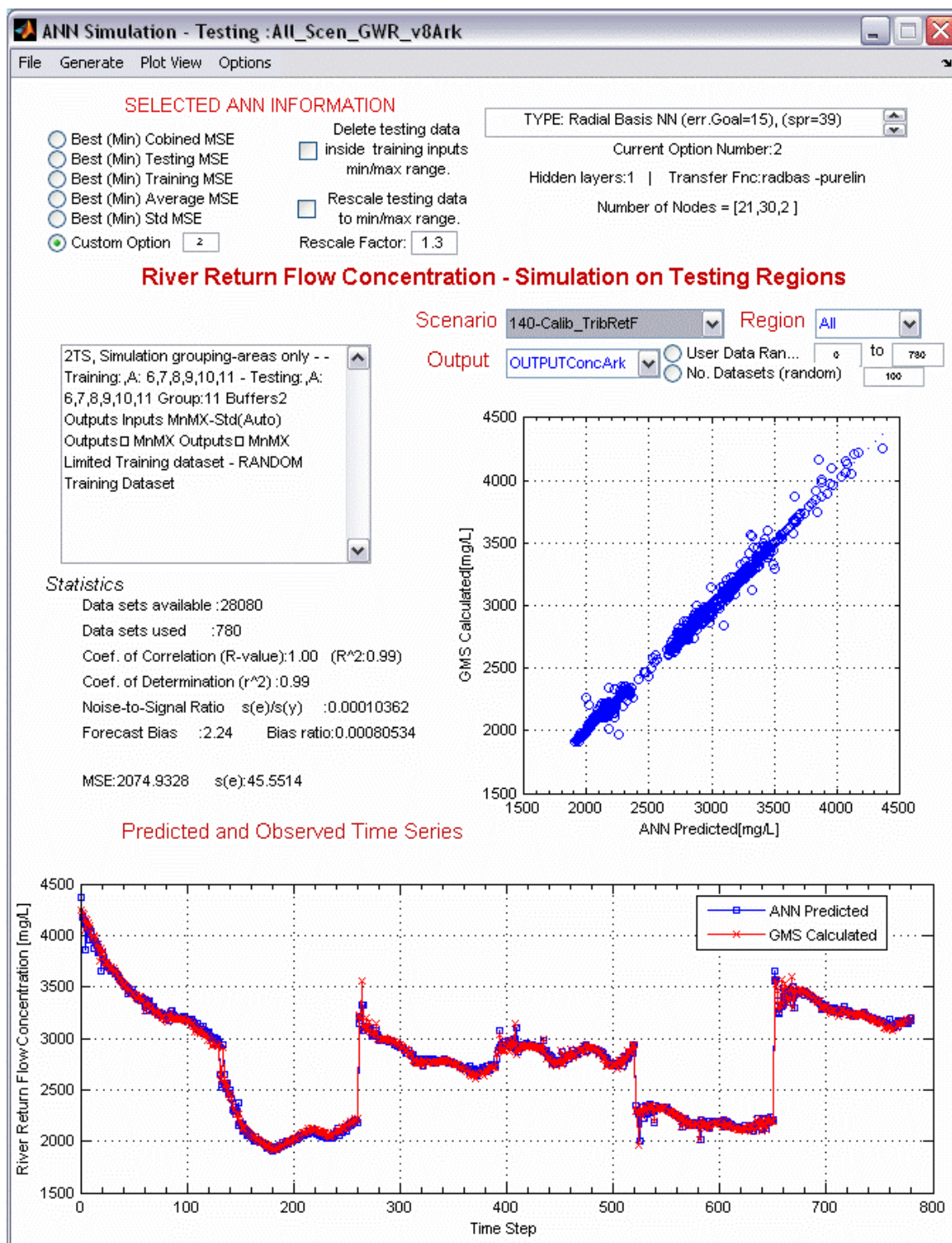
## Arkansas River – Stream-Aquifer Interaction Modeling



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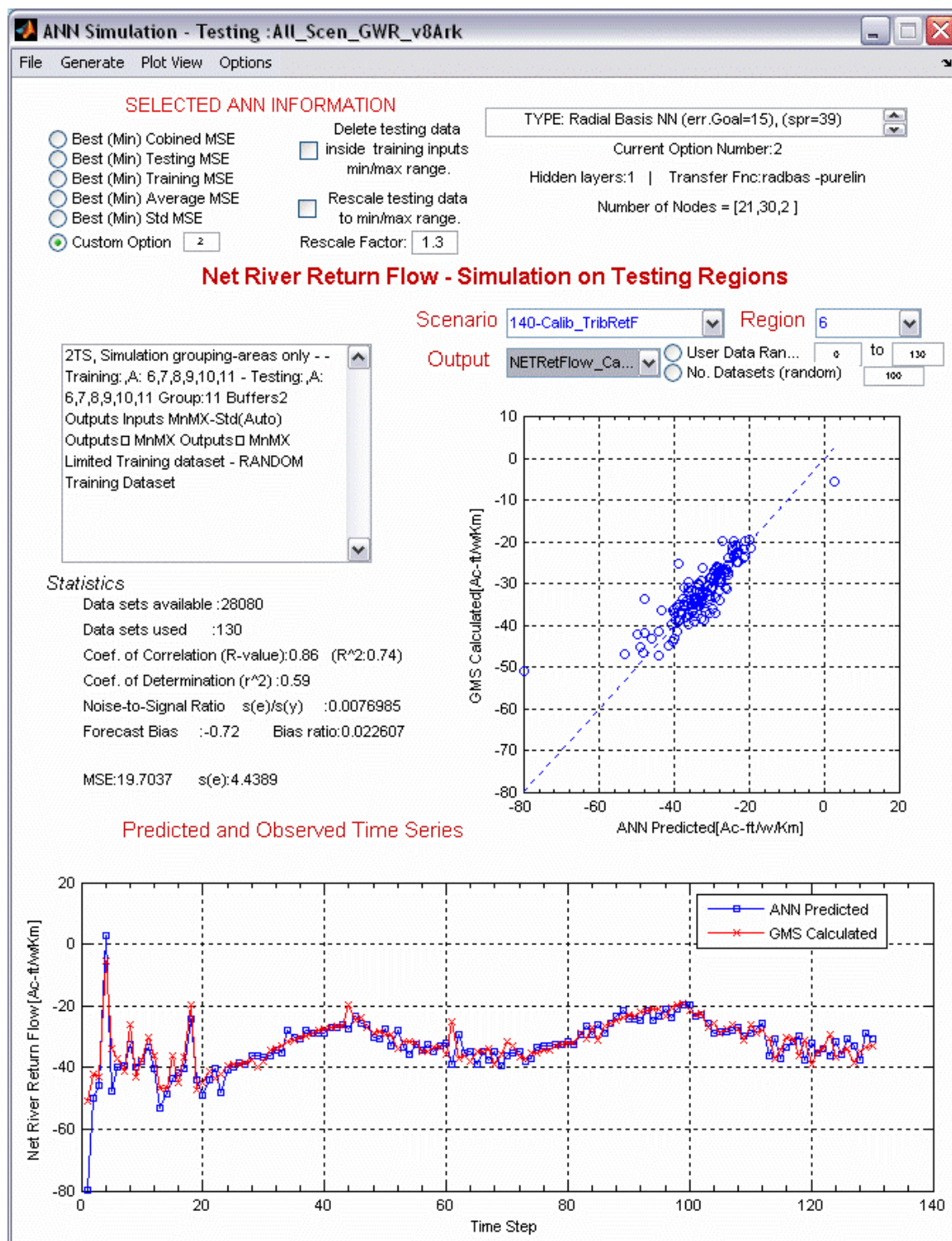


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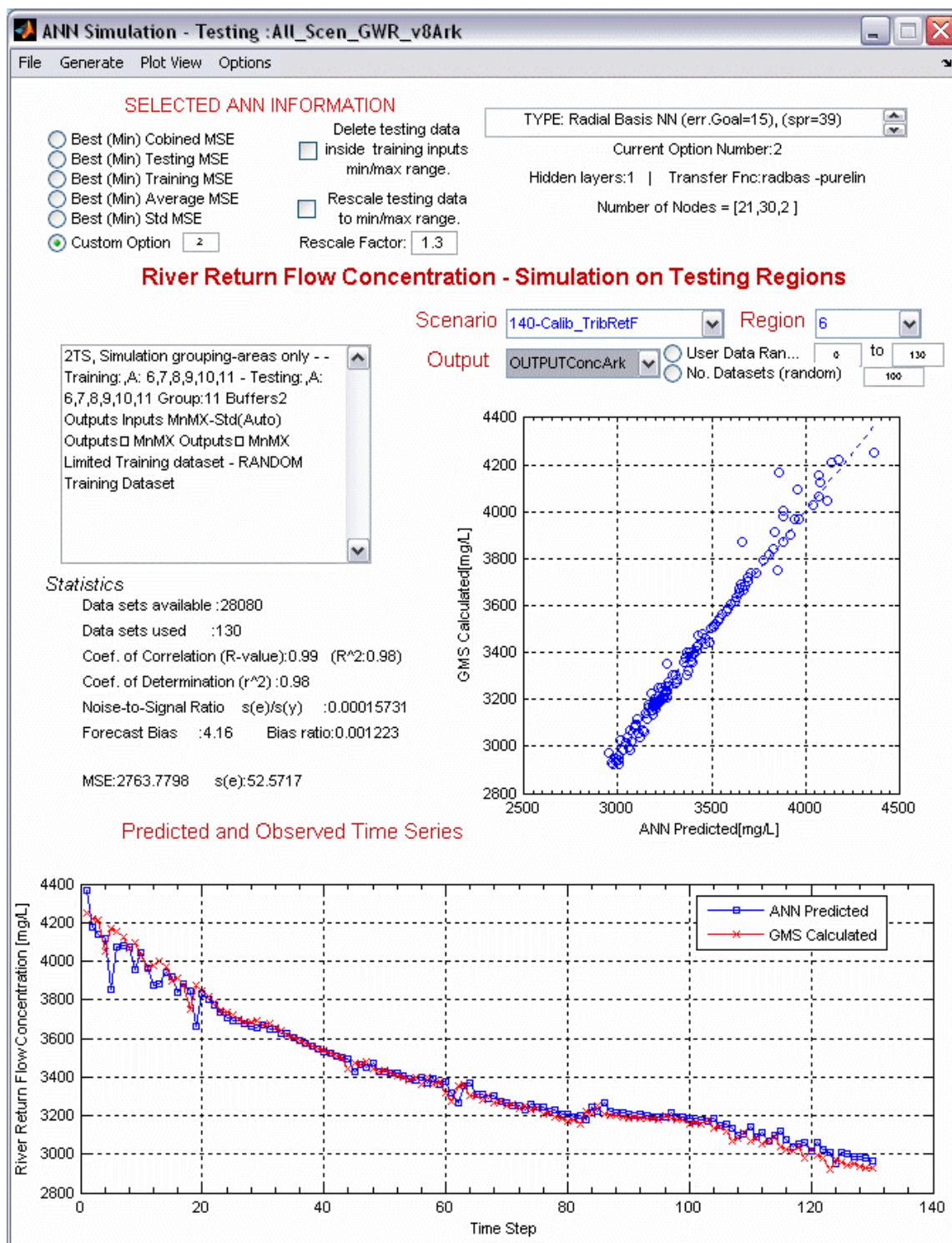




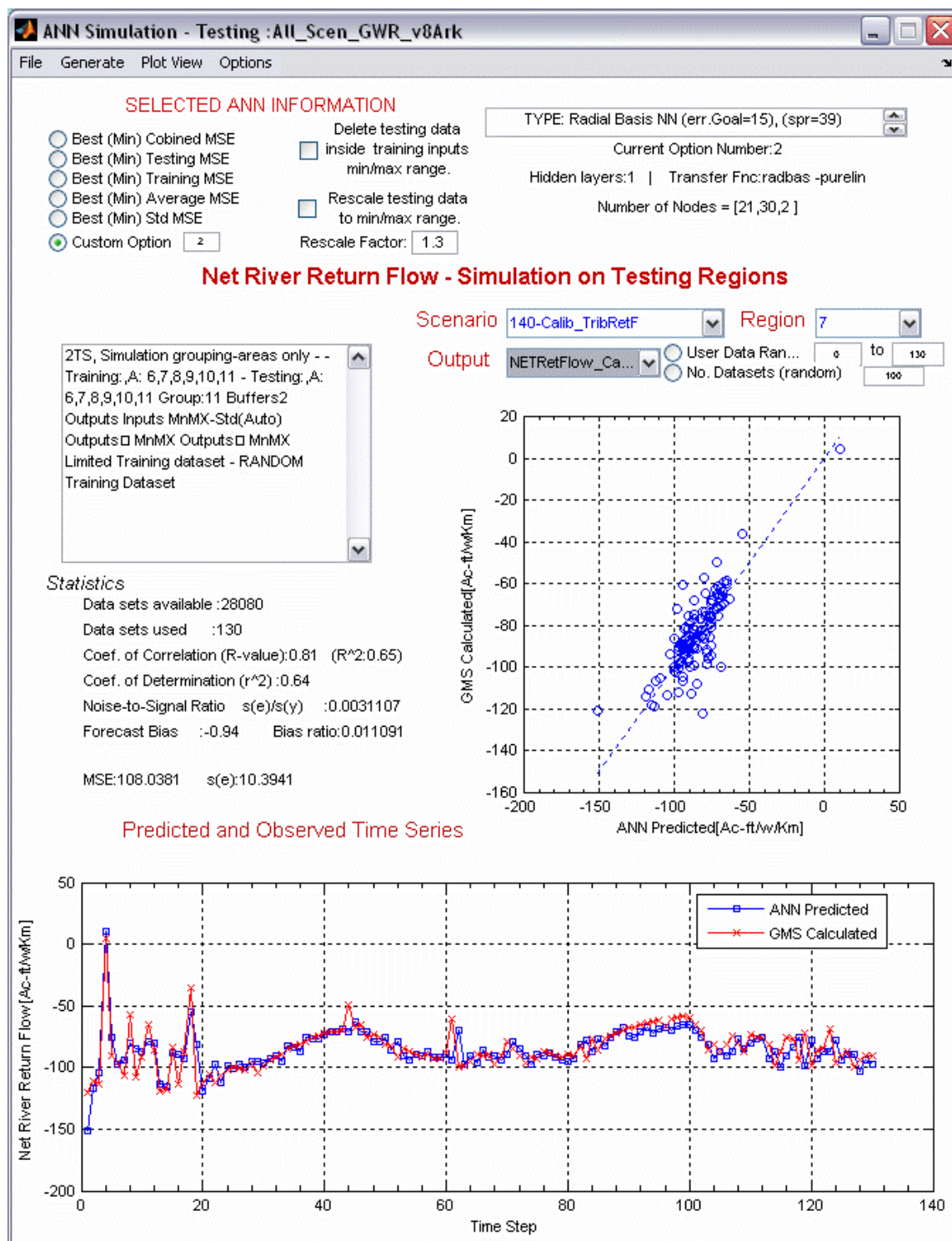
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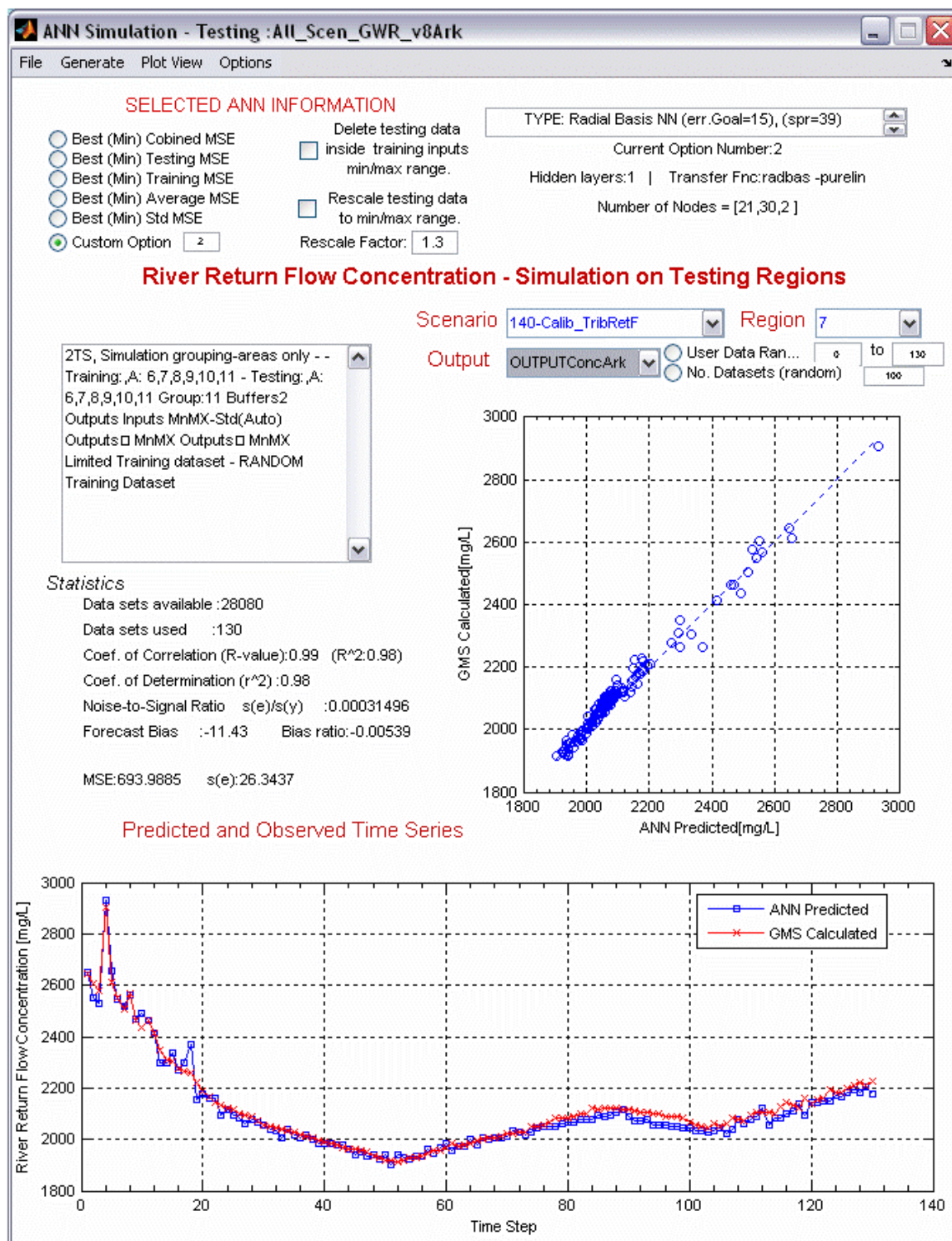
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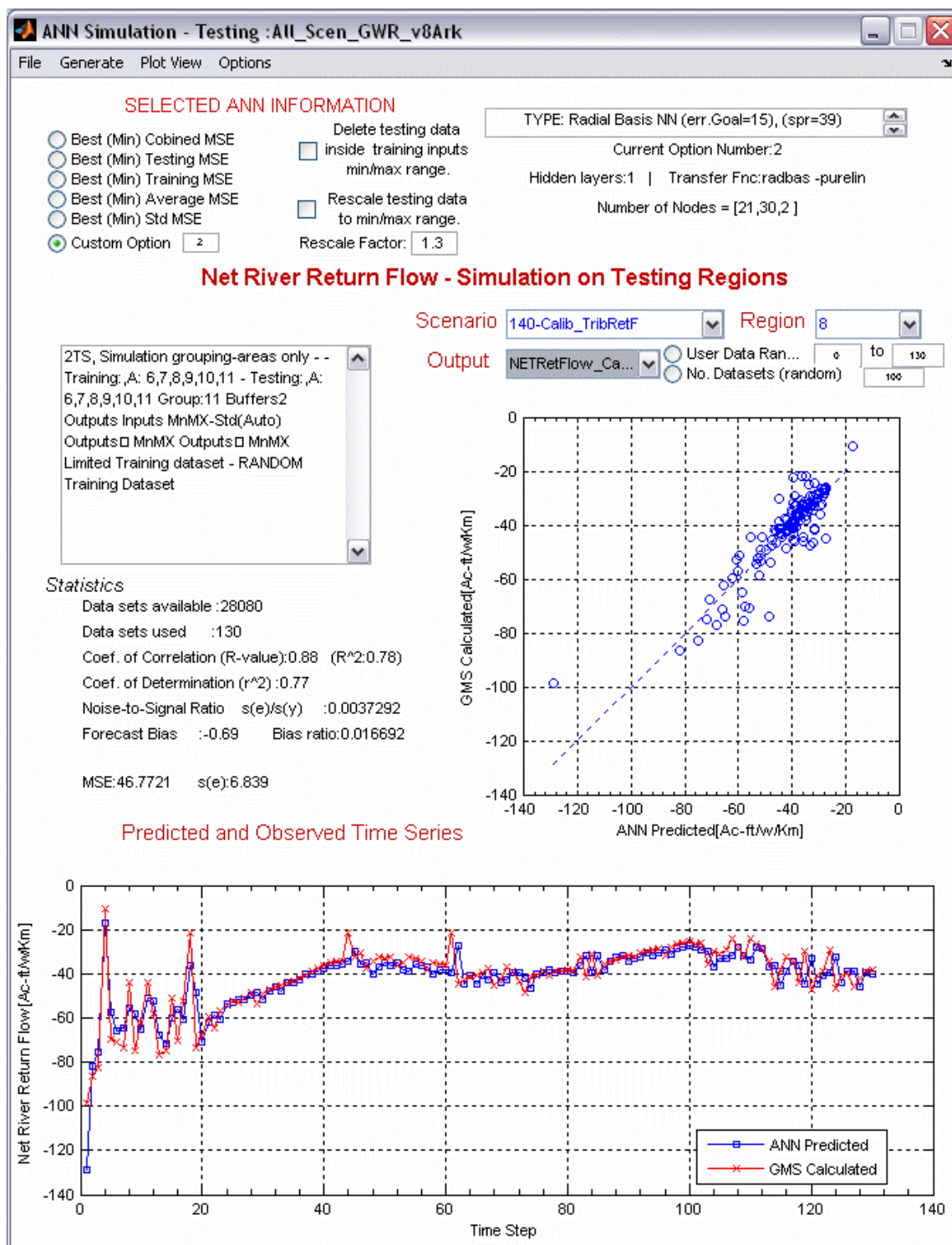


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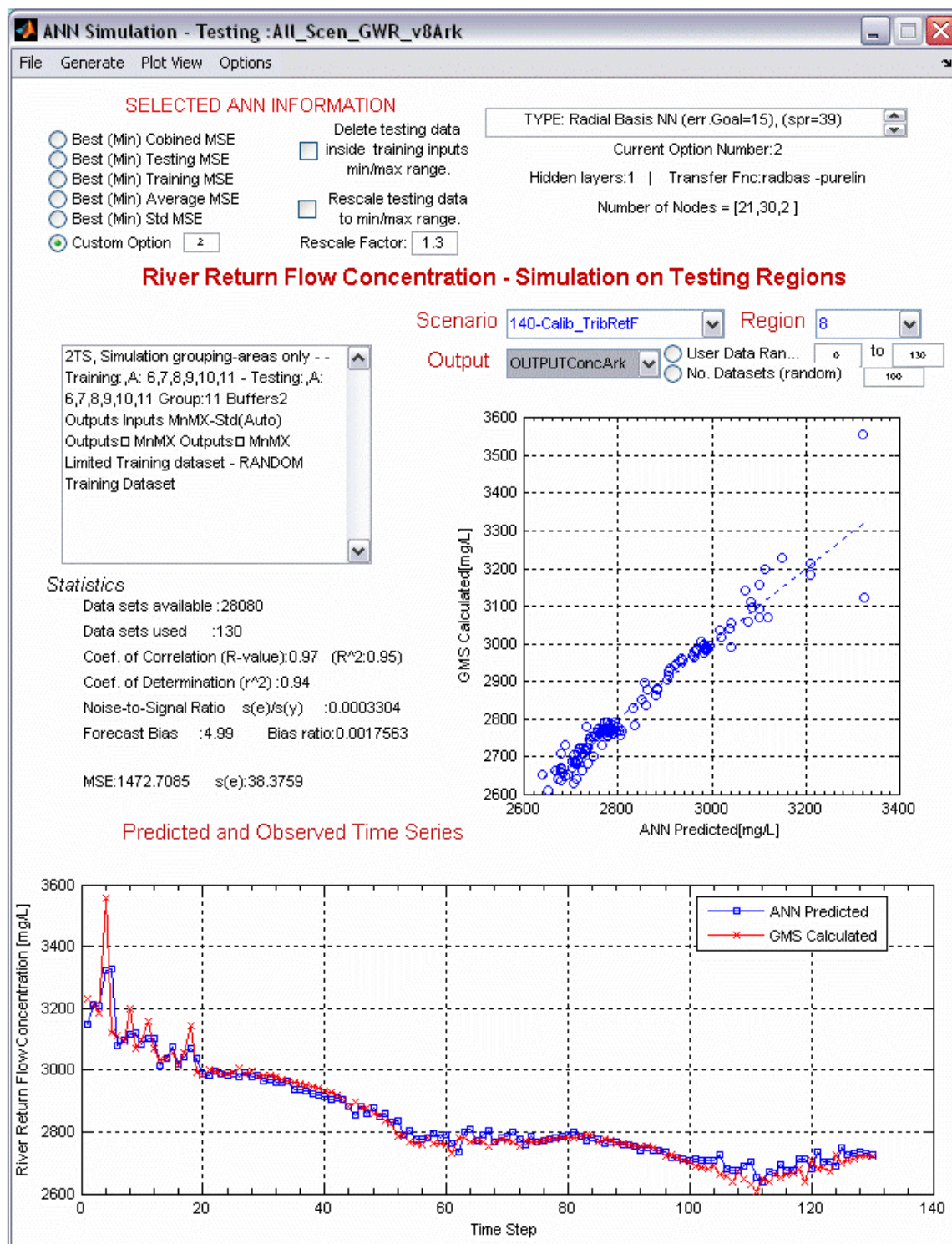




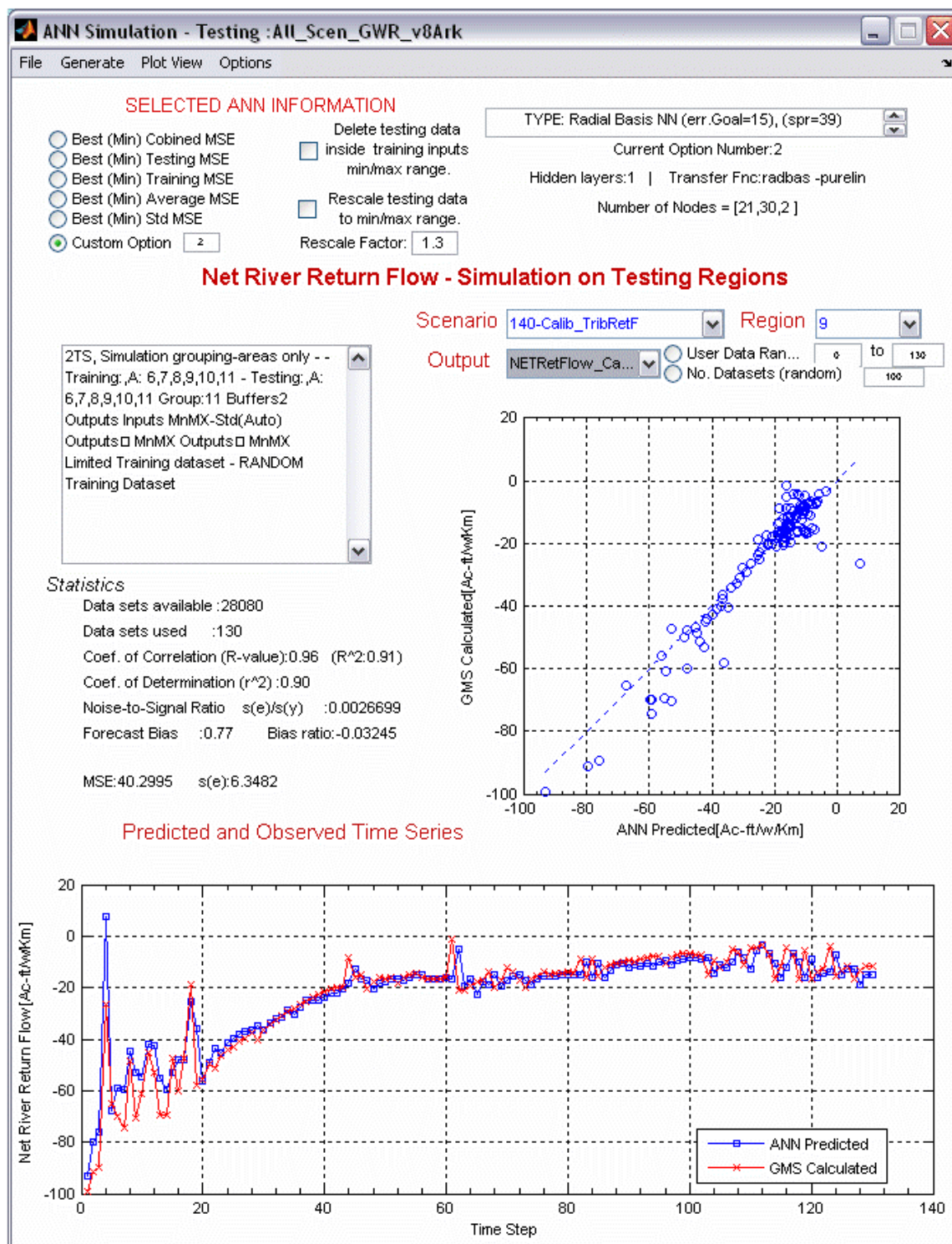
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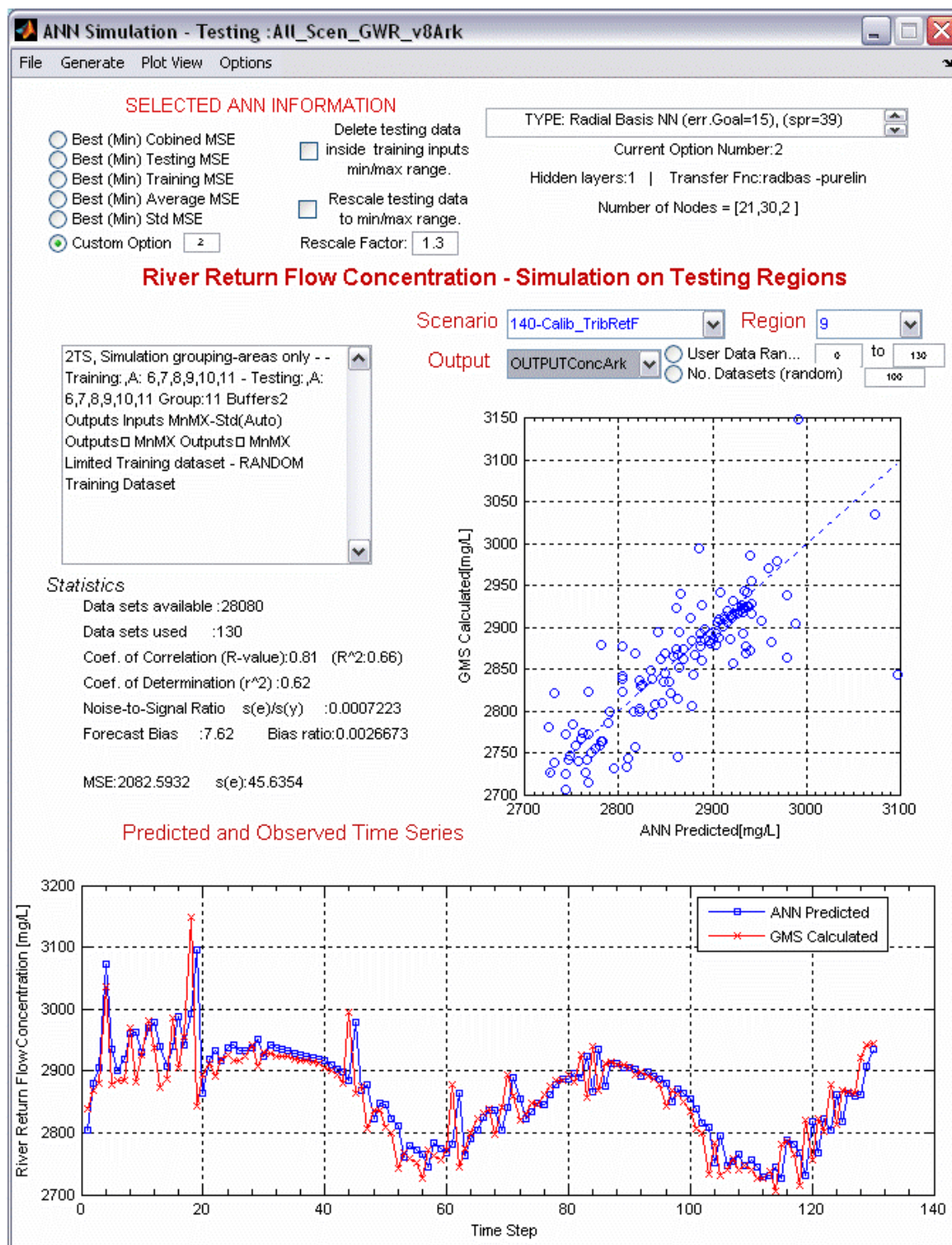


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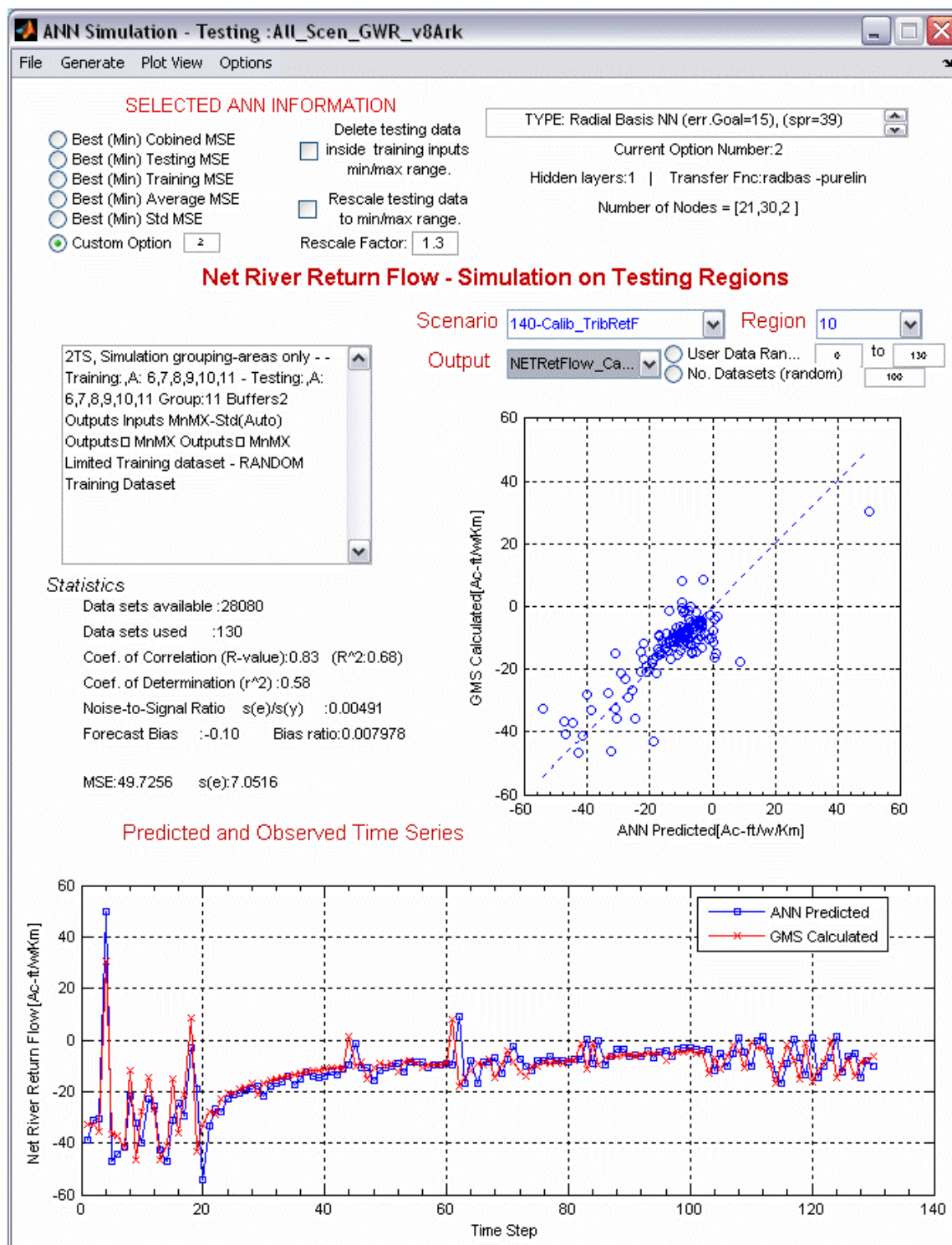




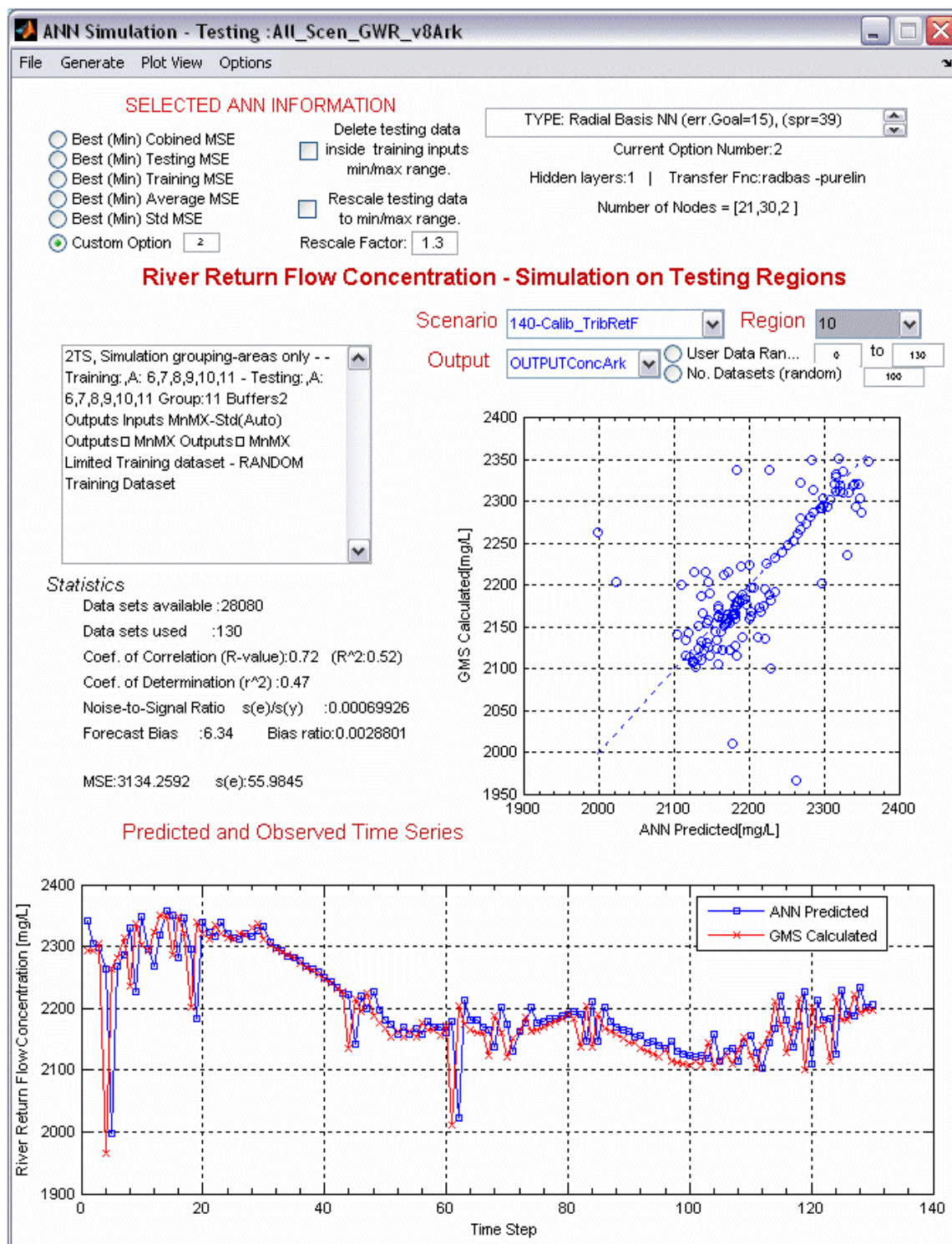
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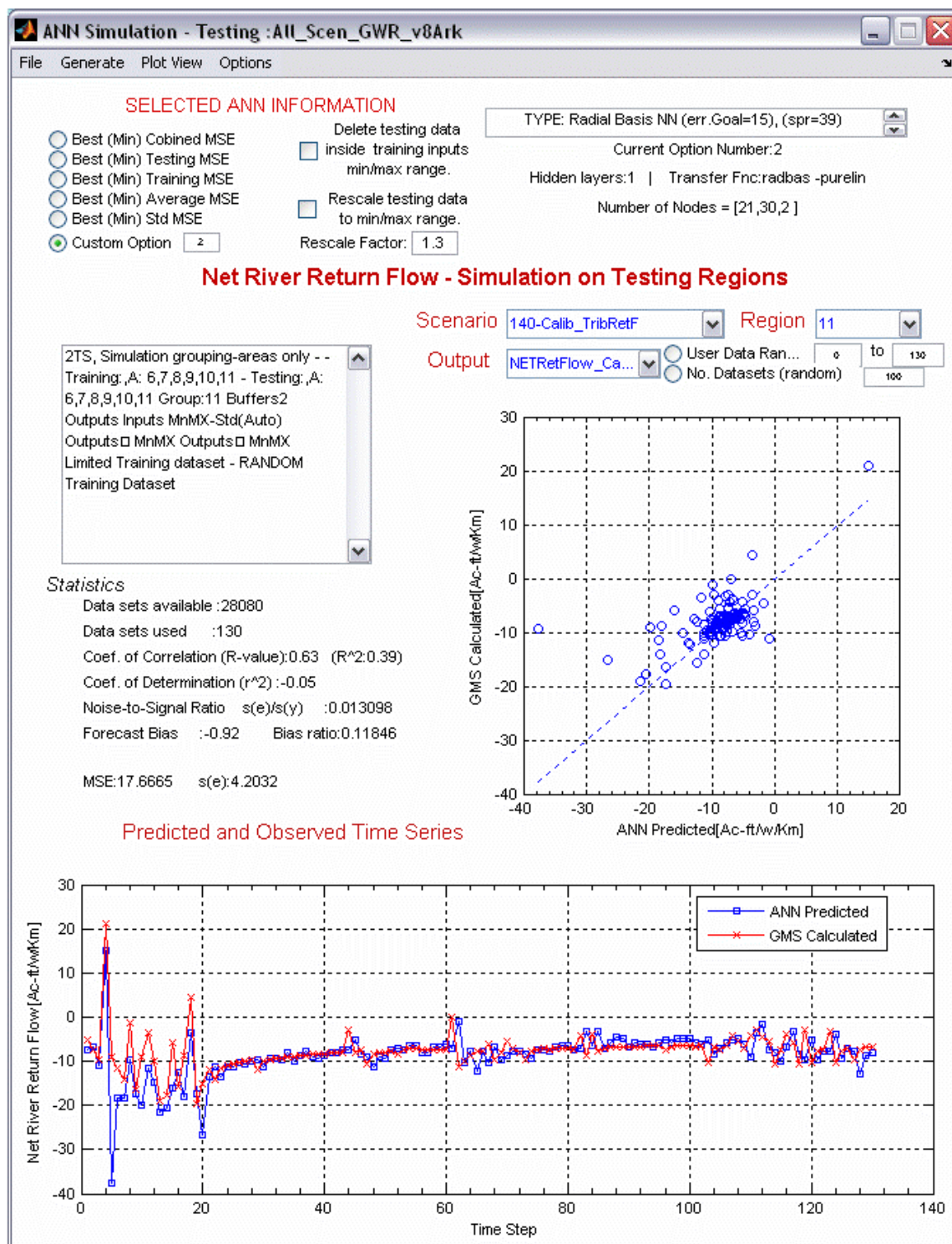


## Arkansas River – Stream-Aquifer Interaction Modeling

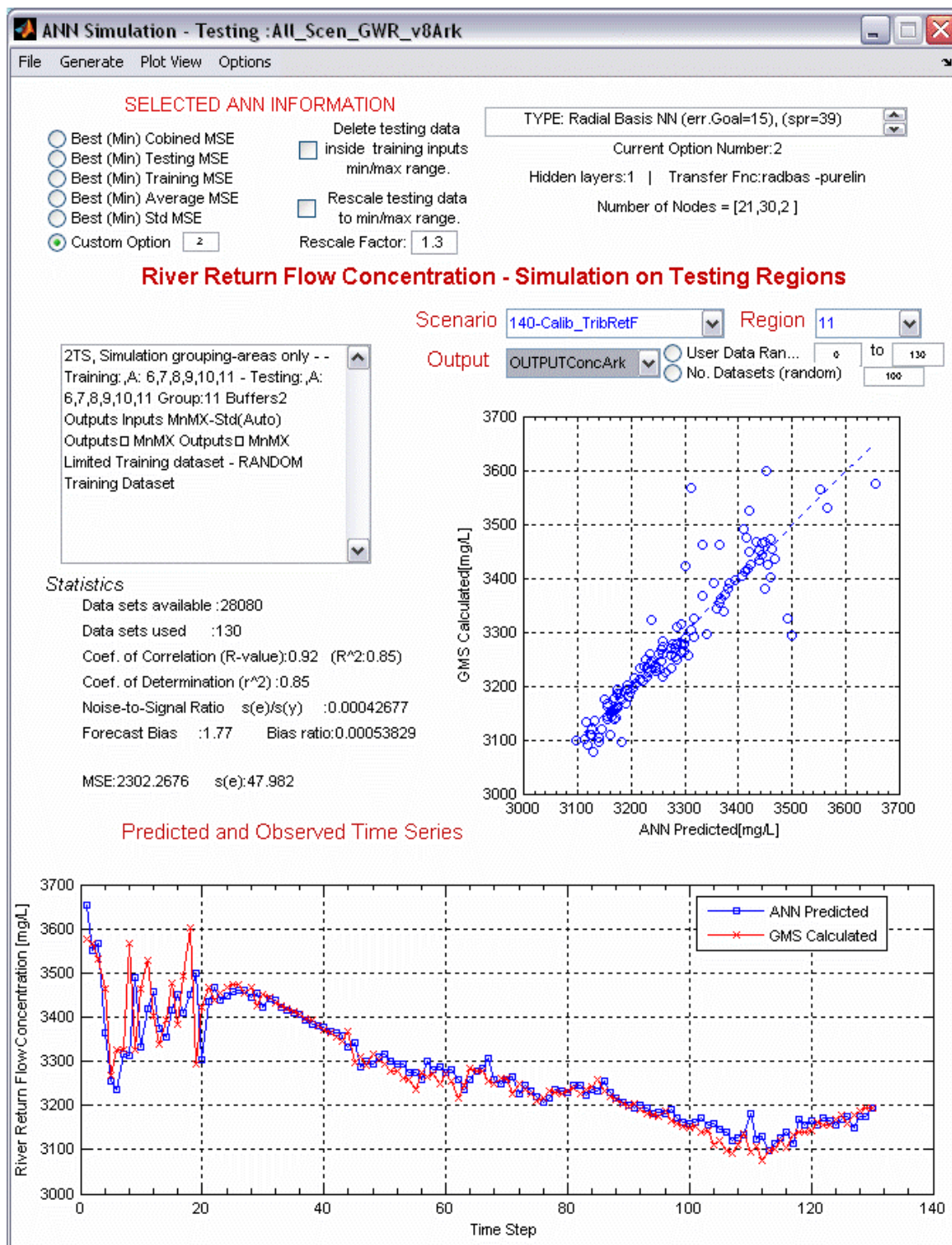




## Arkansas River – Stream-Aquifer Interaction Modeling

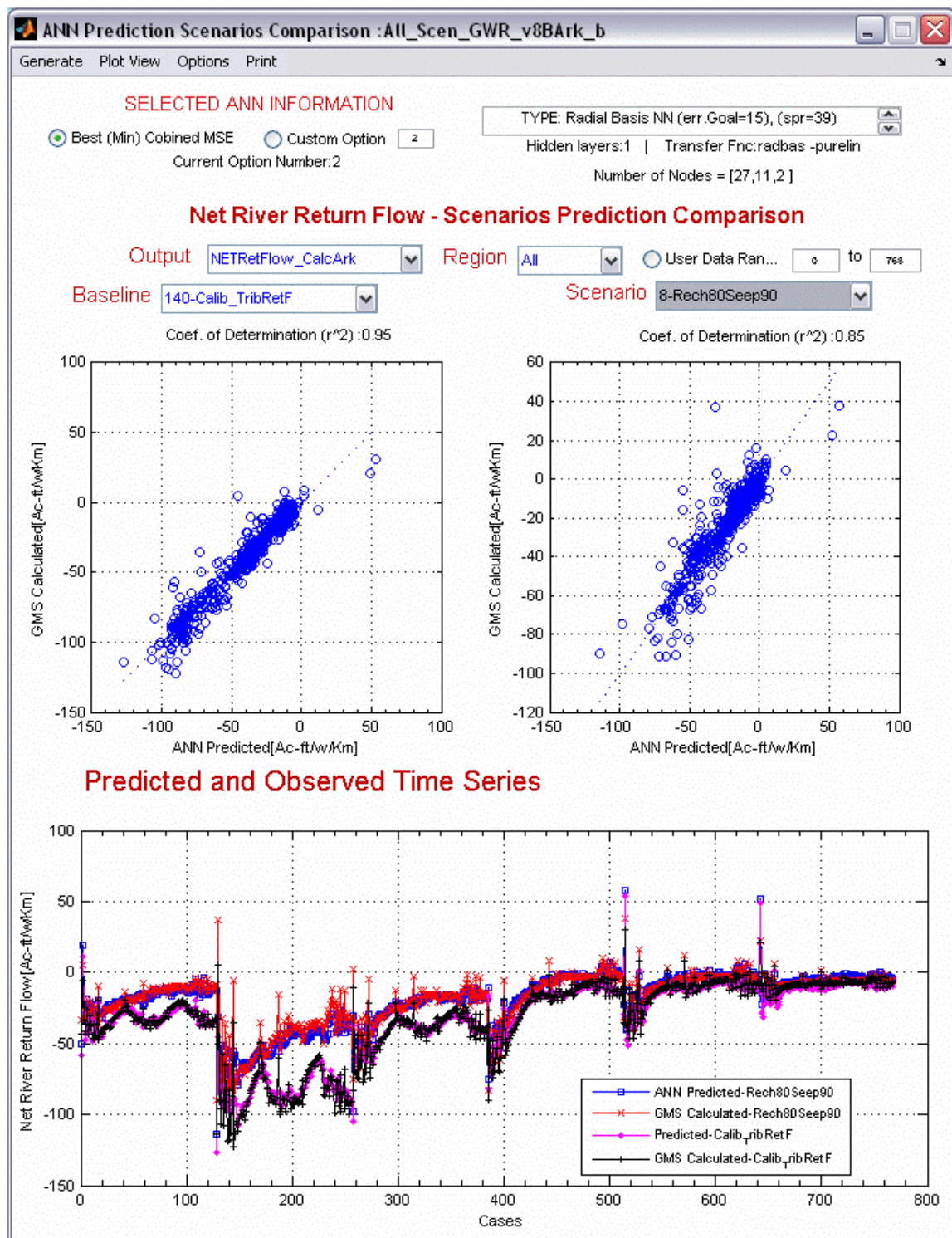


## Arkansas River – Stream-Aquifer Interaction Modeling



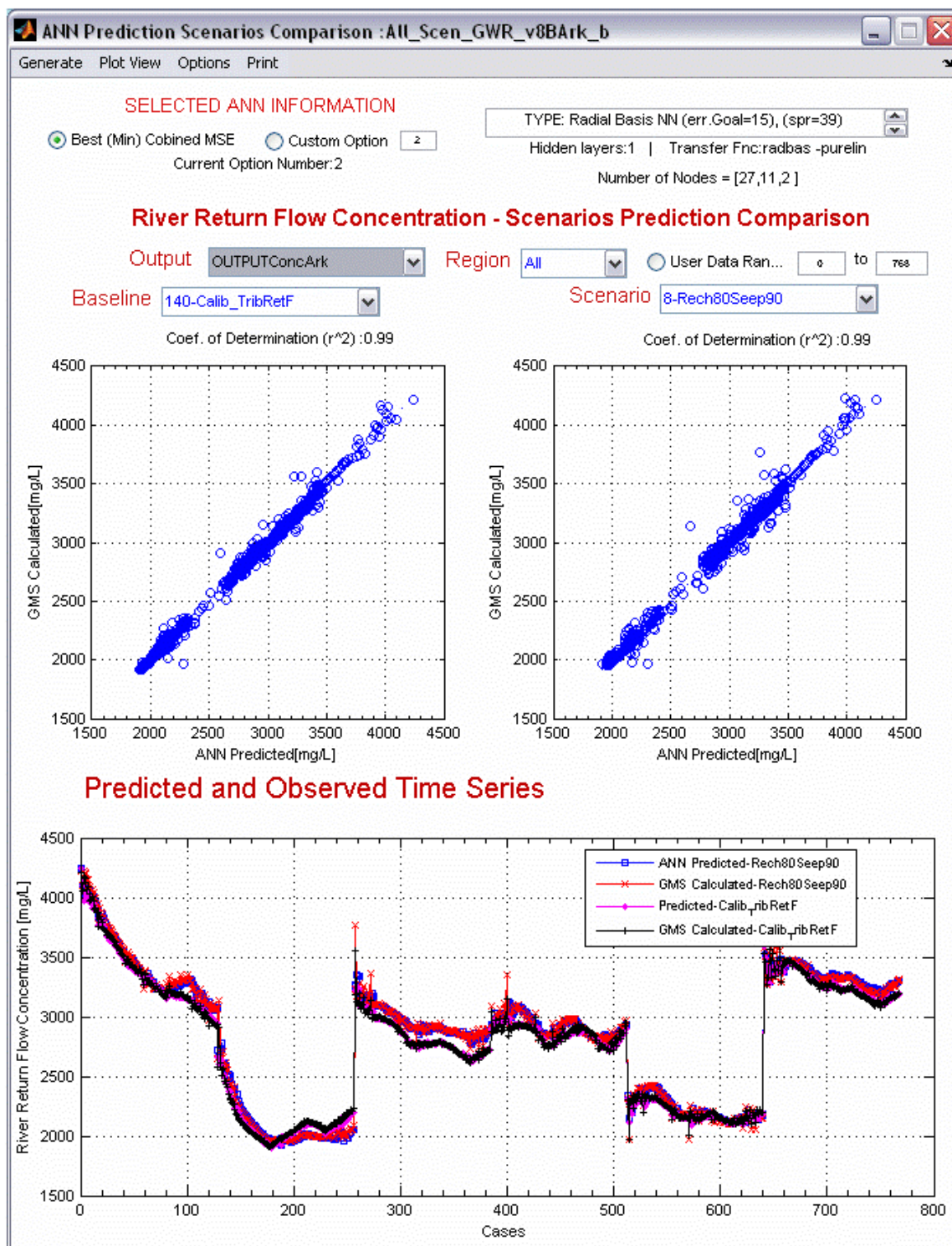
## All\_Scen\_GWR\_v8Ark\_b ANN Baseline and Scenarios Selected Comparisons

## Arkansas River – Stream-Aquifer Interaction Modeling

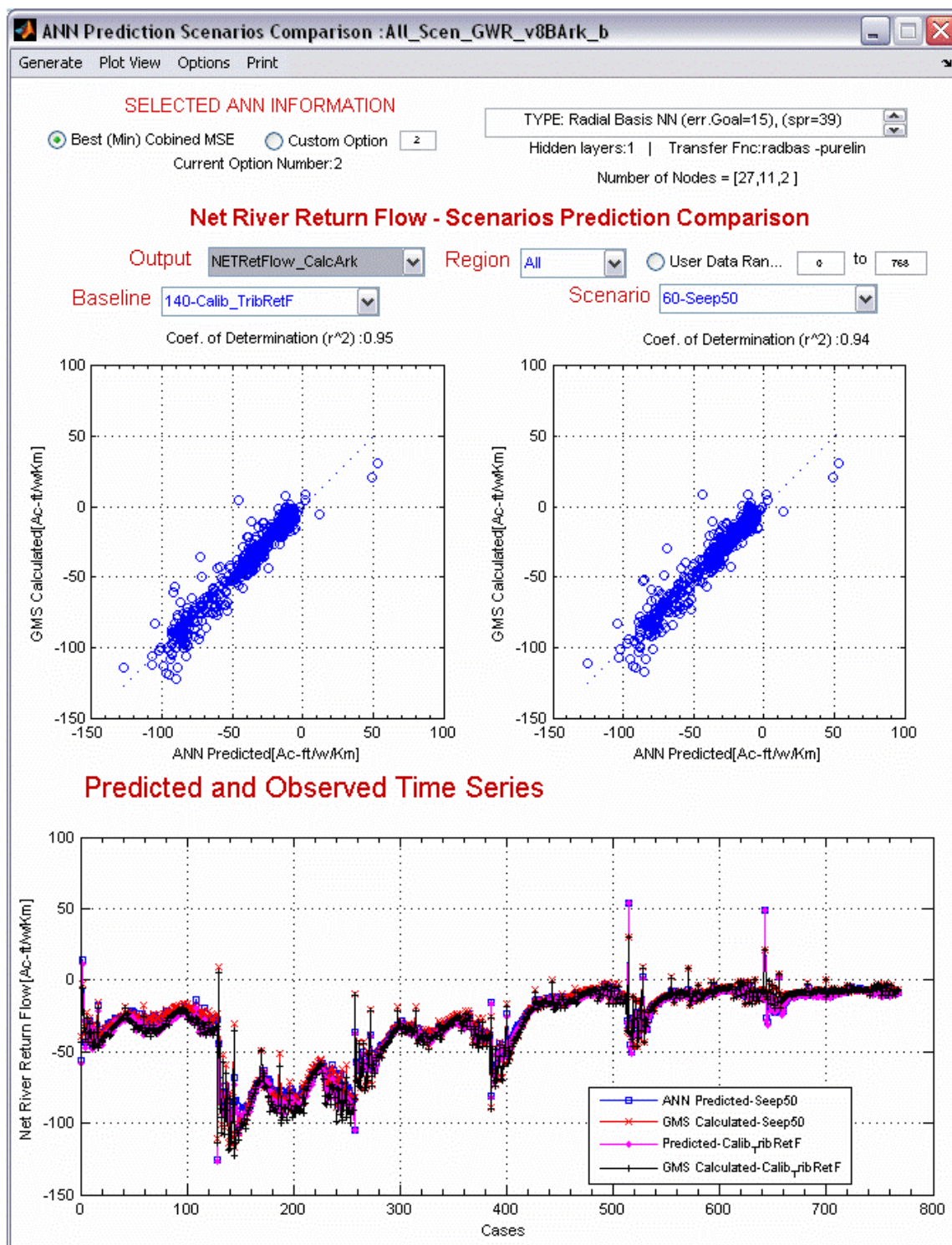




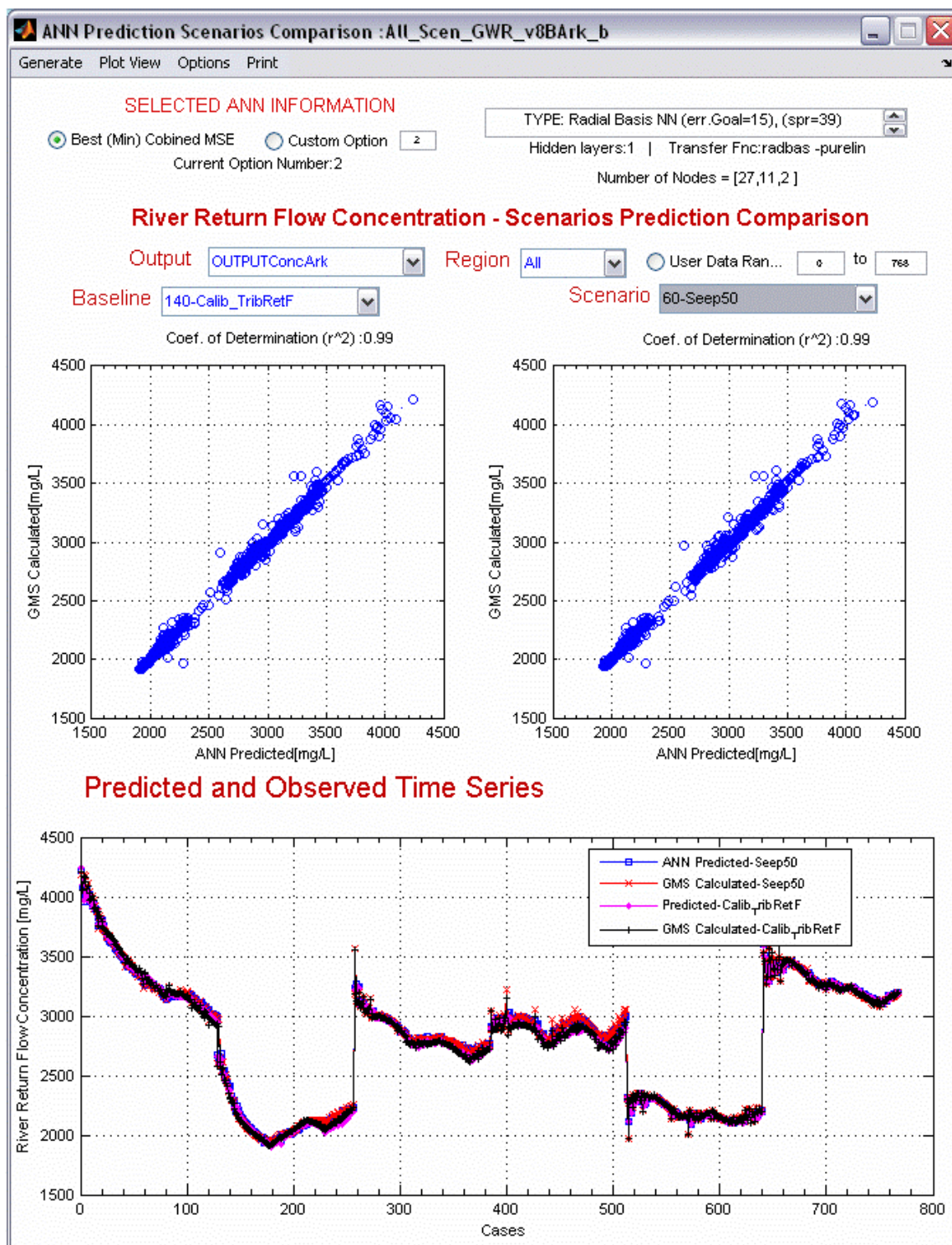
## Arkansas River – Stream-Aquifer Interaction Modeling



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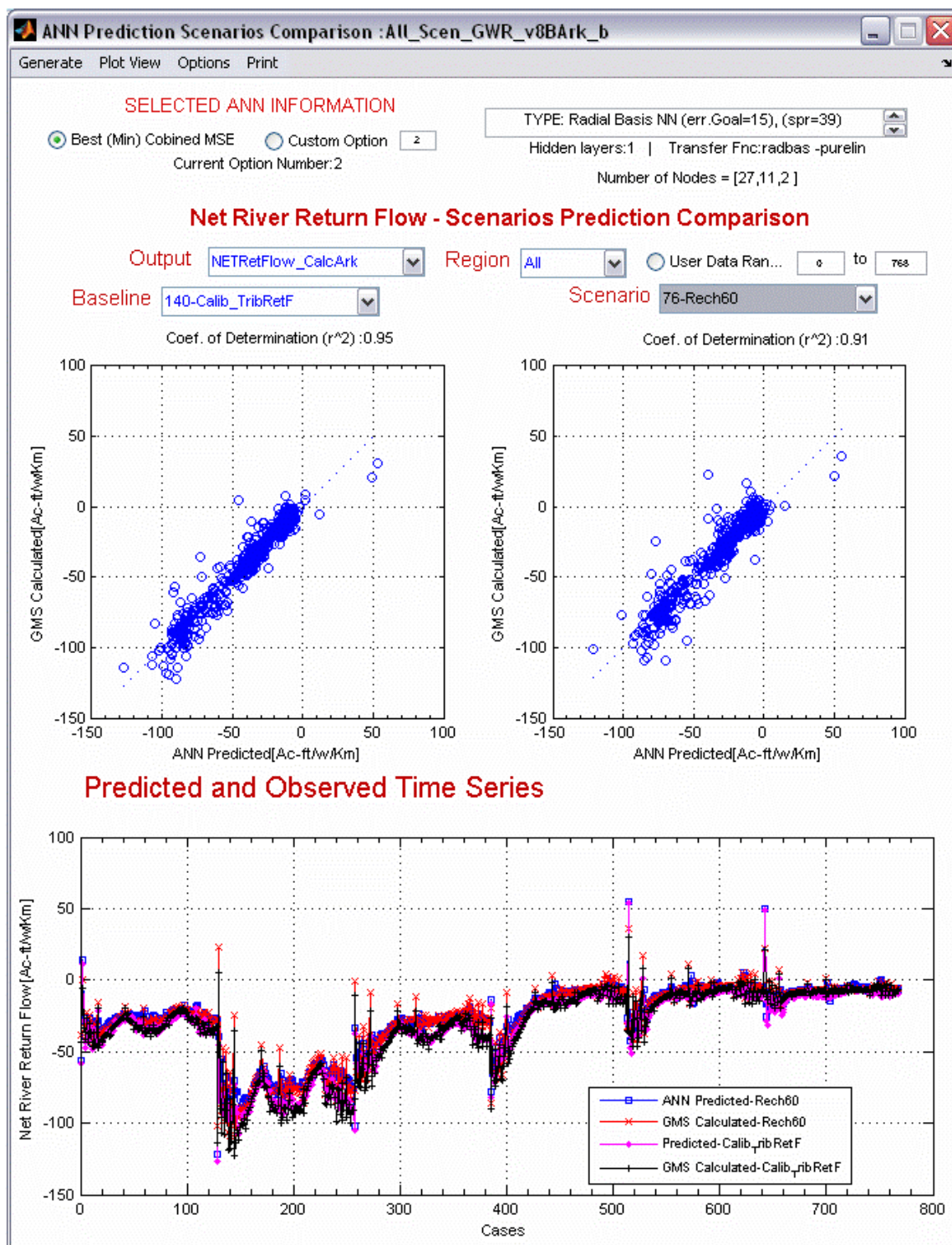


## Arkansas River – Stream-Aquifer Interaction Modeling

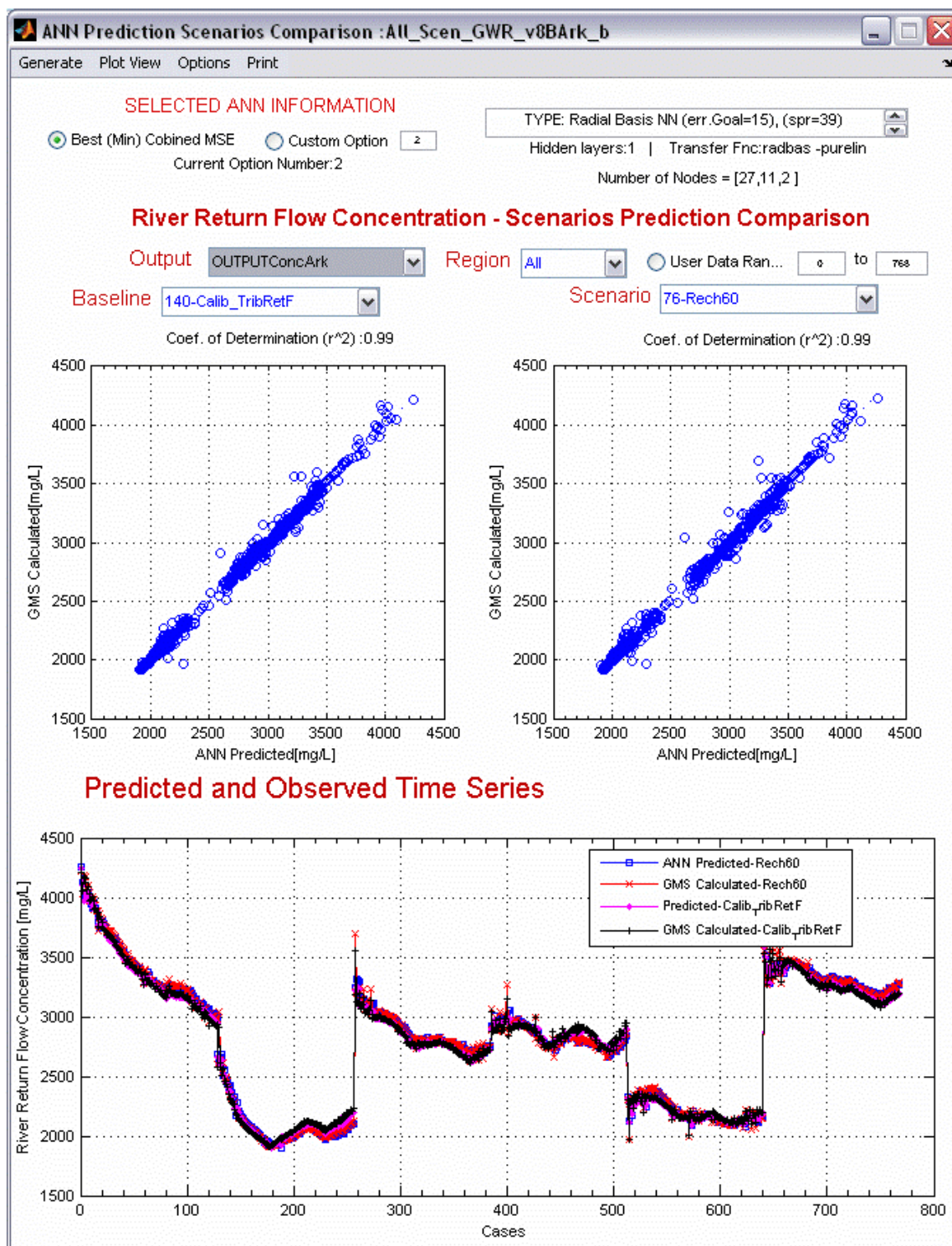




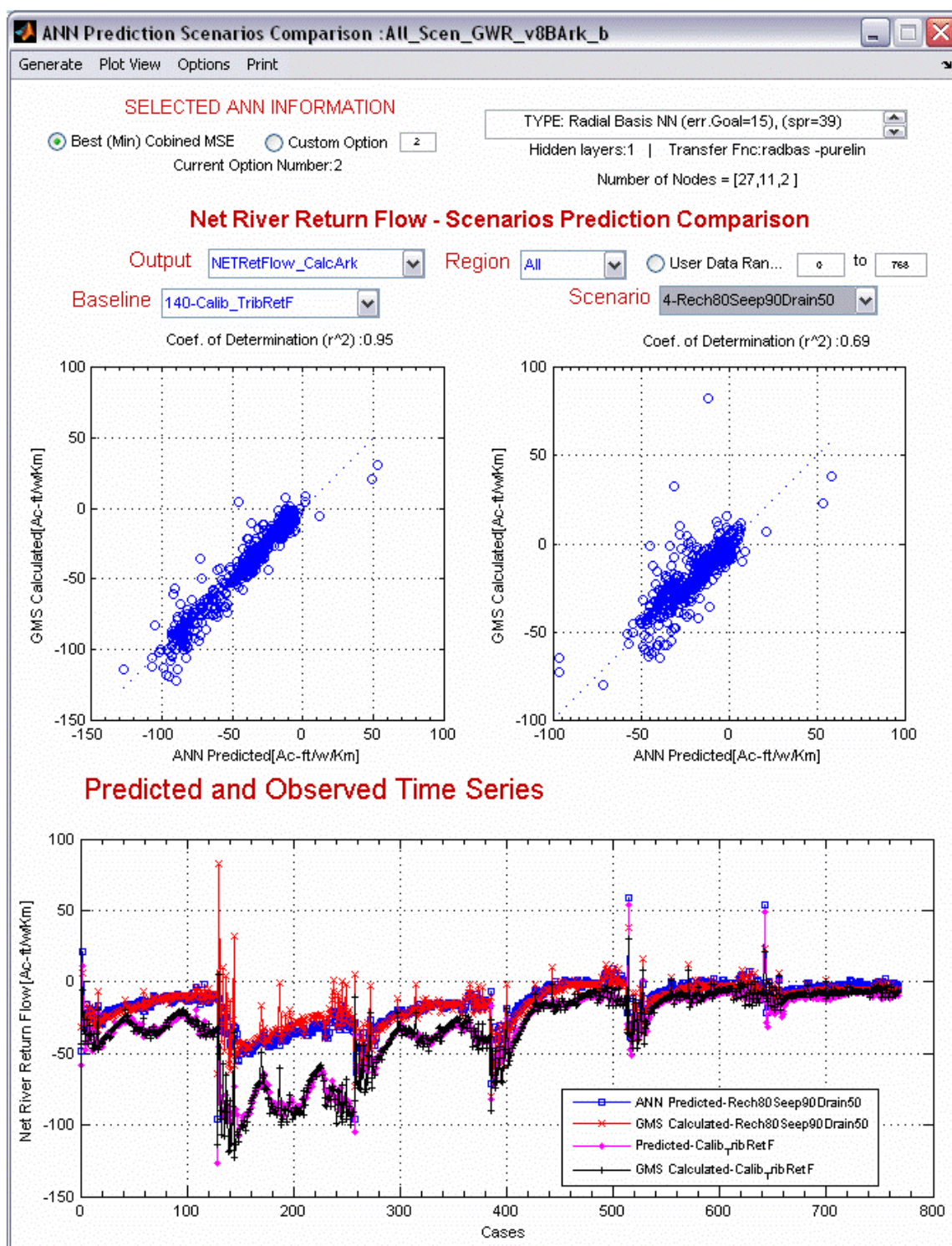
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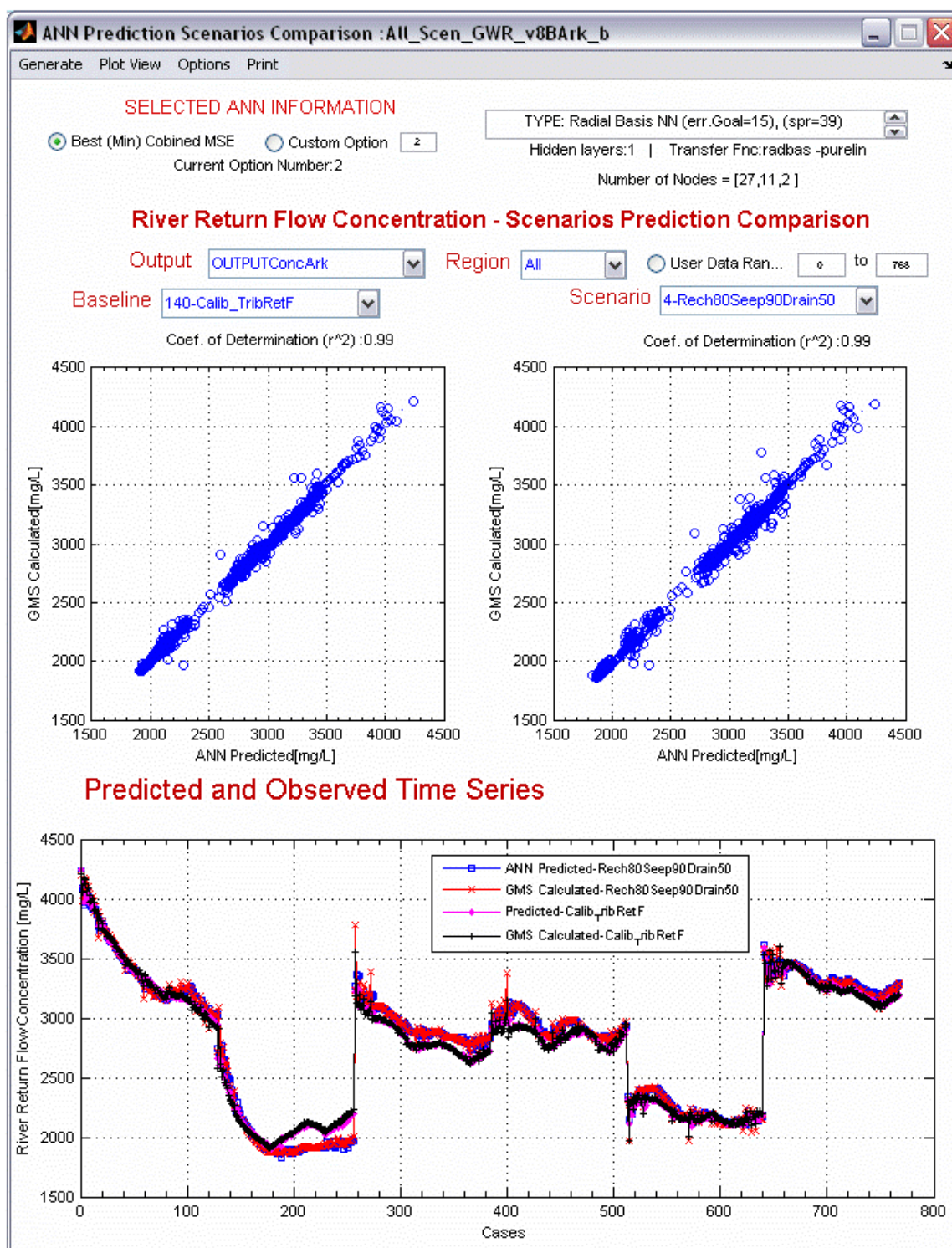


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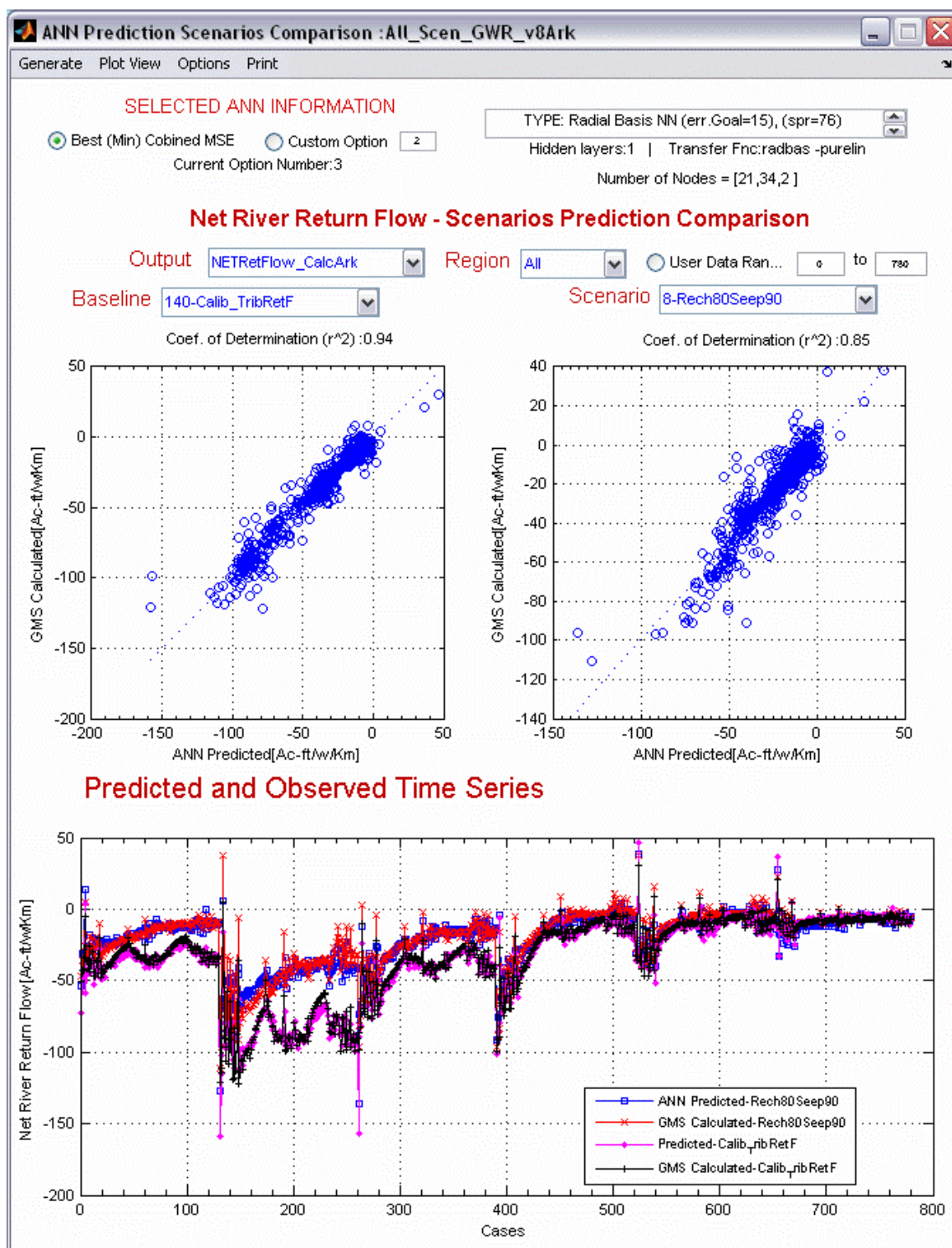


## Arkansas River – Stream-Aquifer Interaction Modeling

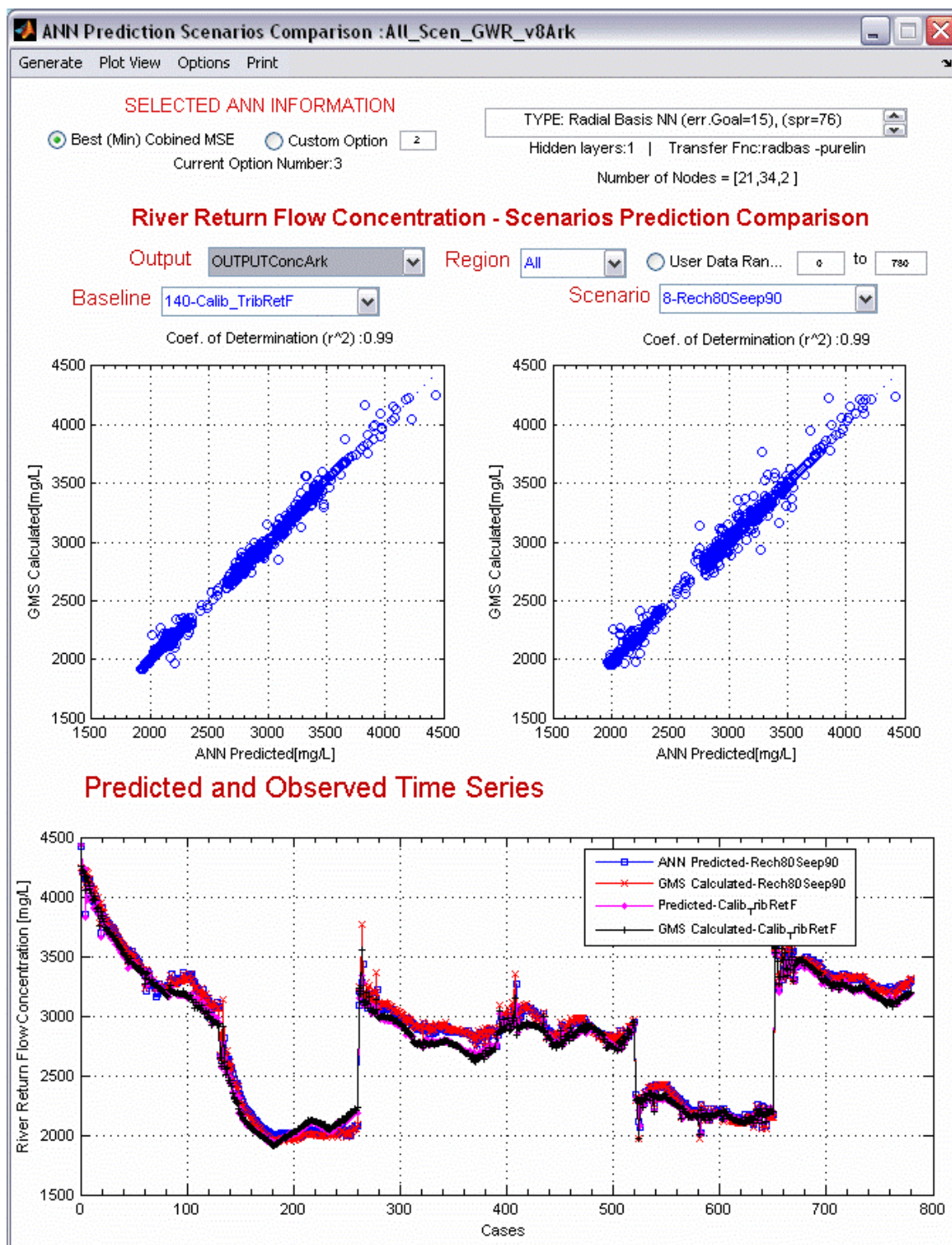


## All\_Scen\_GWR\_v8Ark ANN Baseline and Scenarios Selected Comparisons

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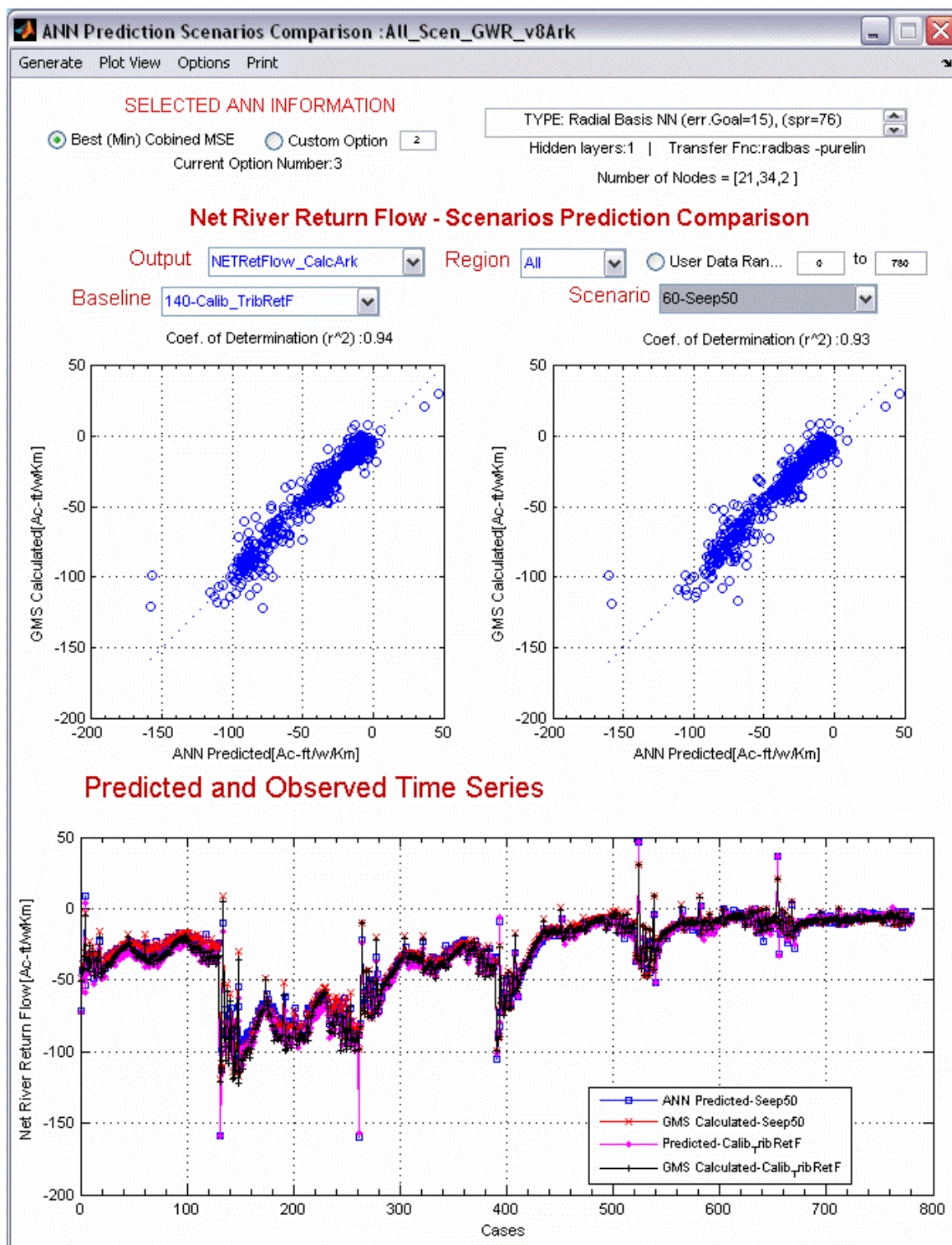


## Arkansas River – Stream-Aquifer Interaction Modeling

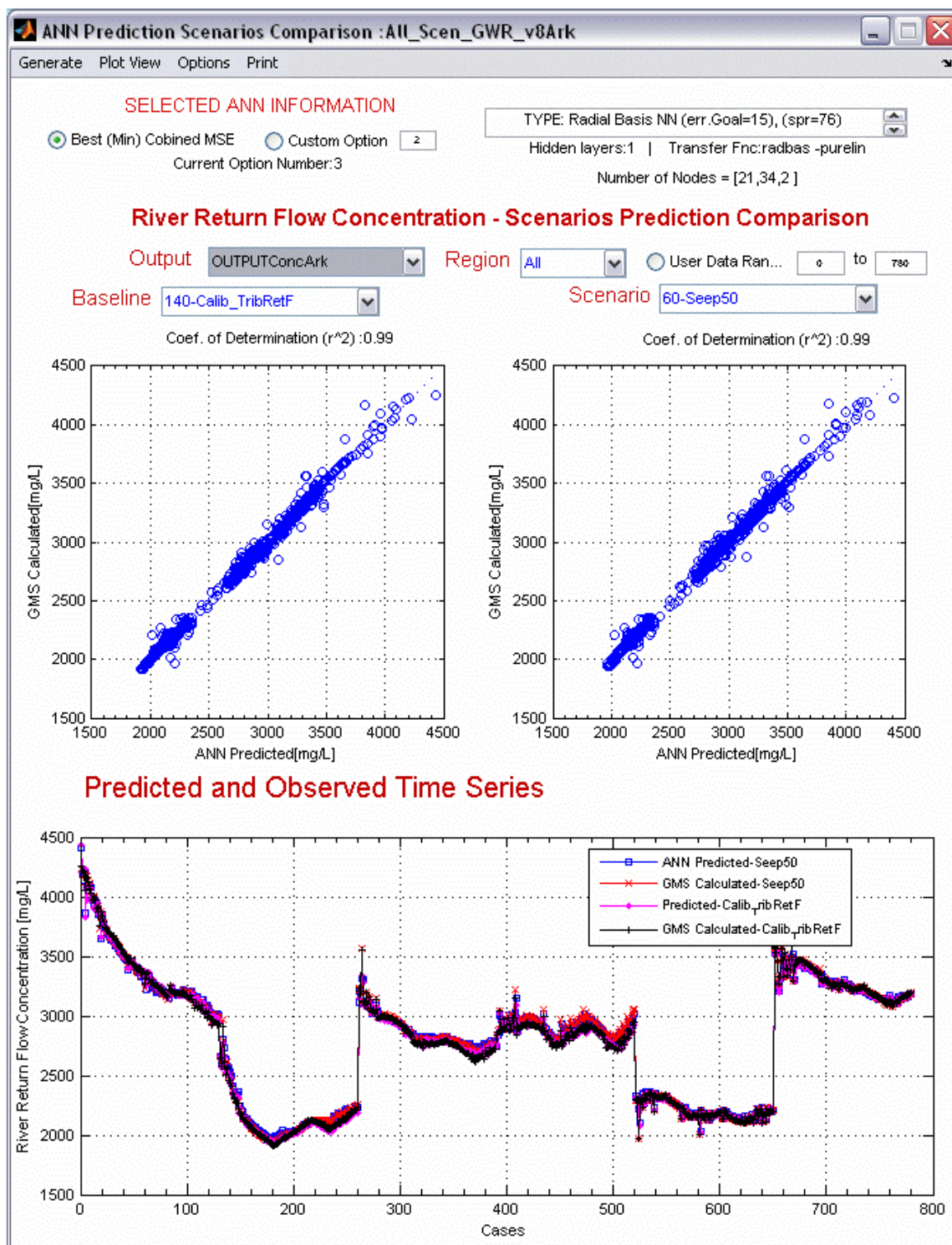


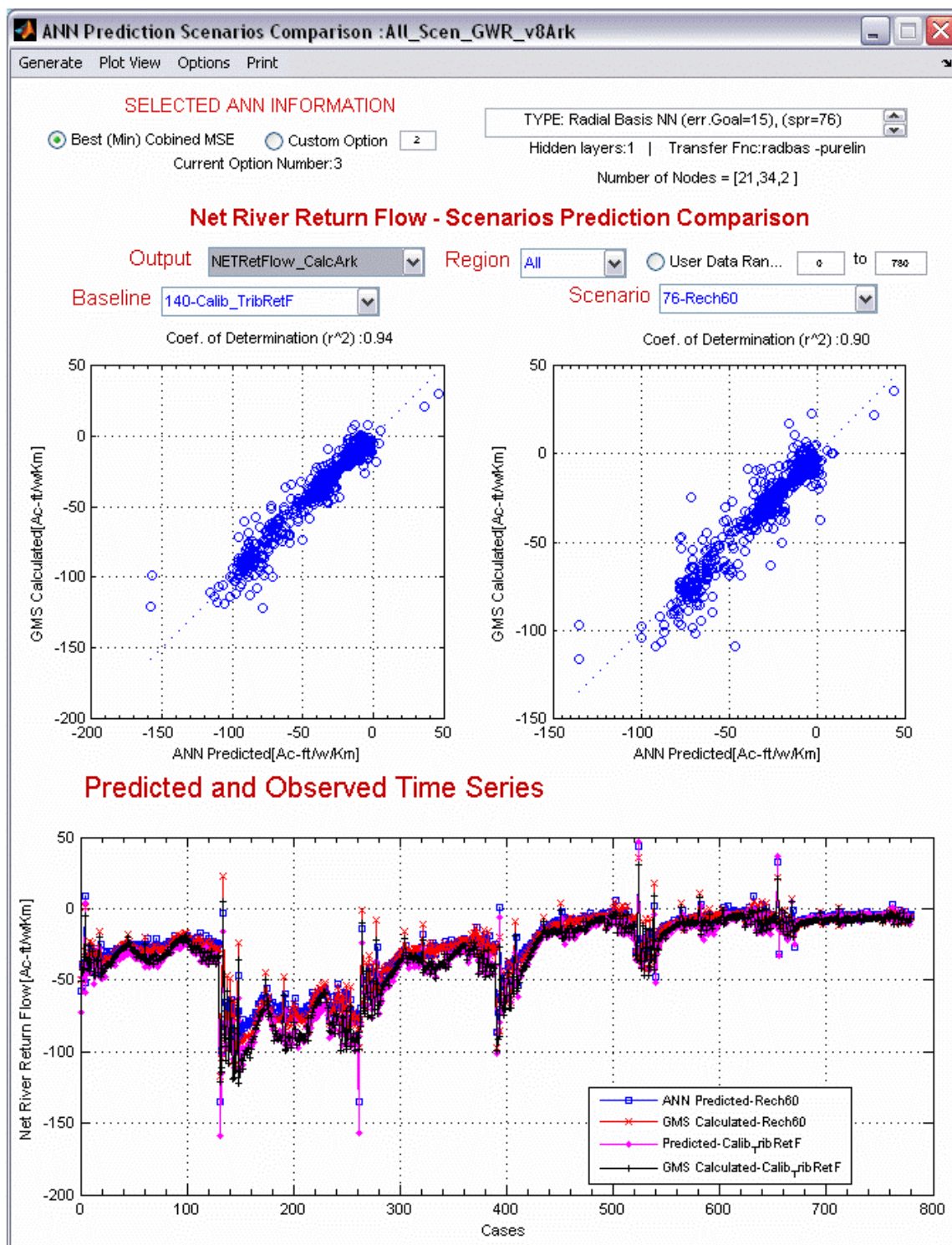


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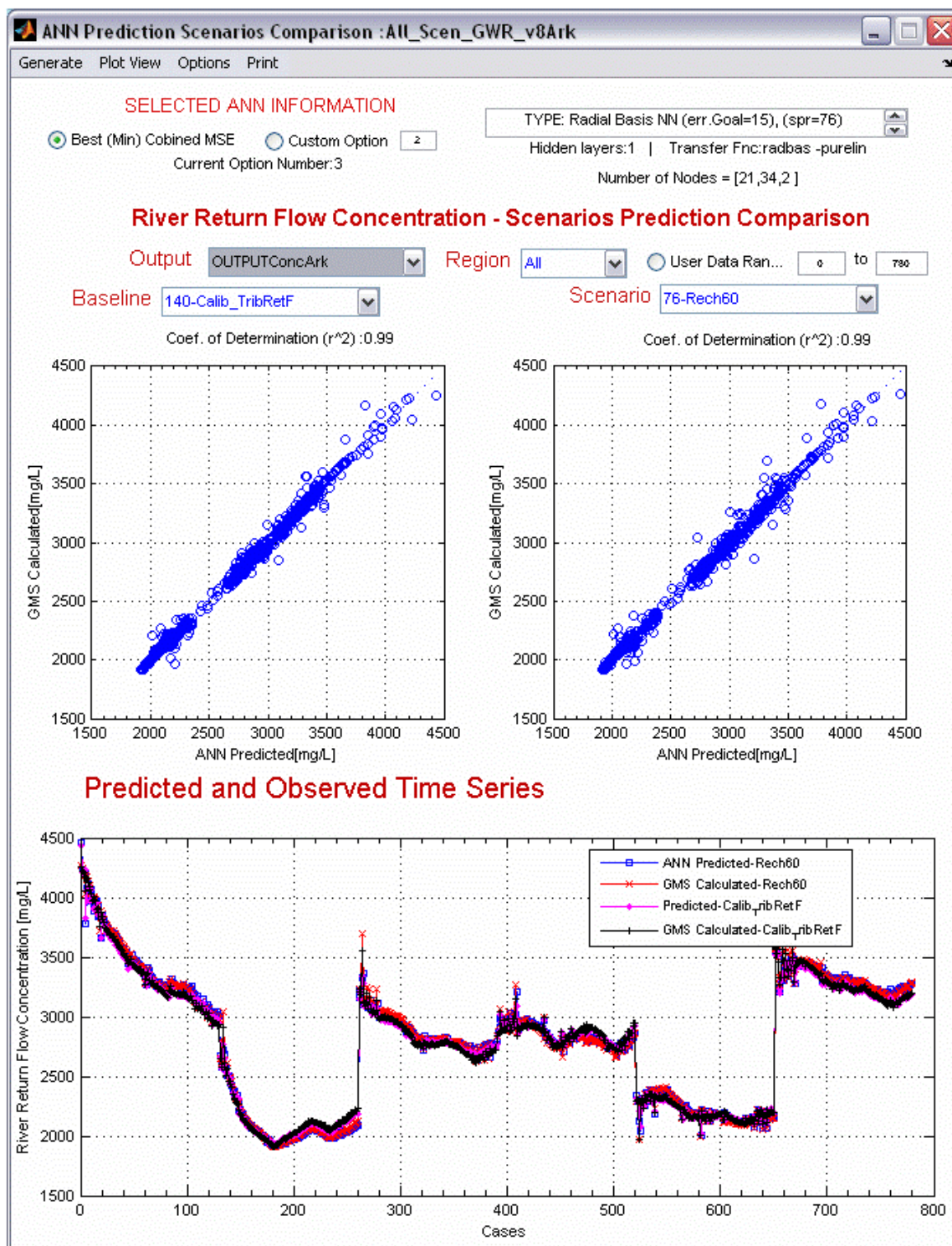
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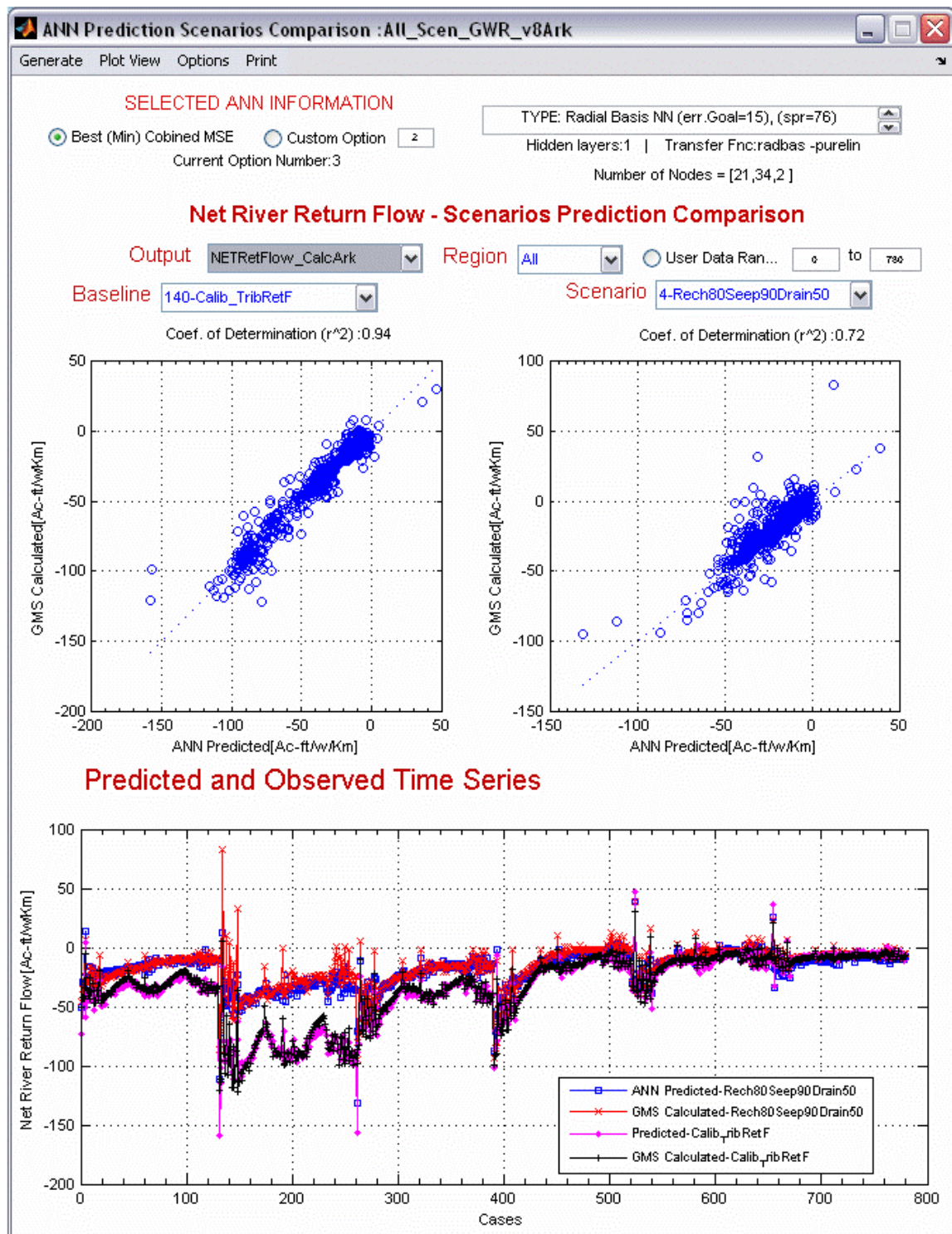




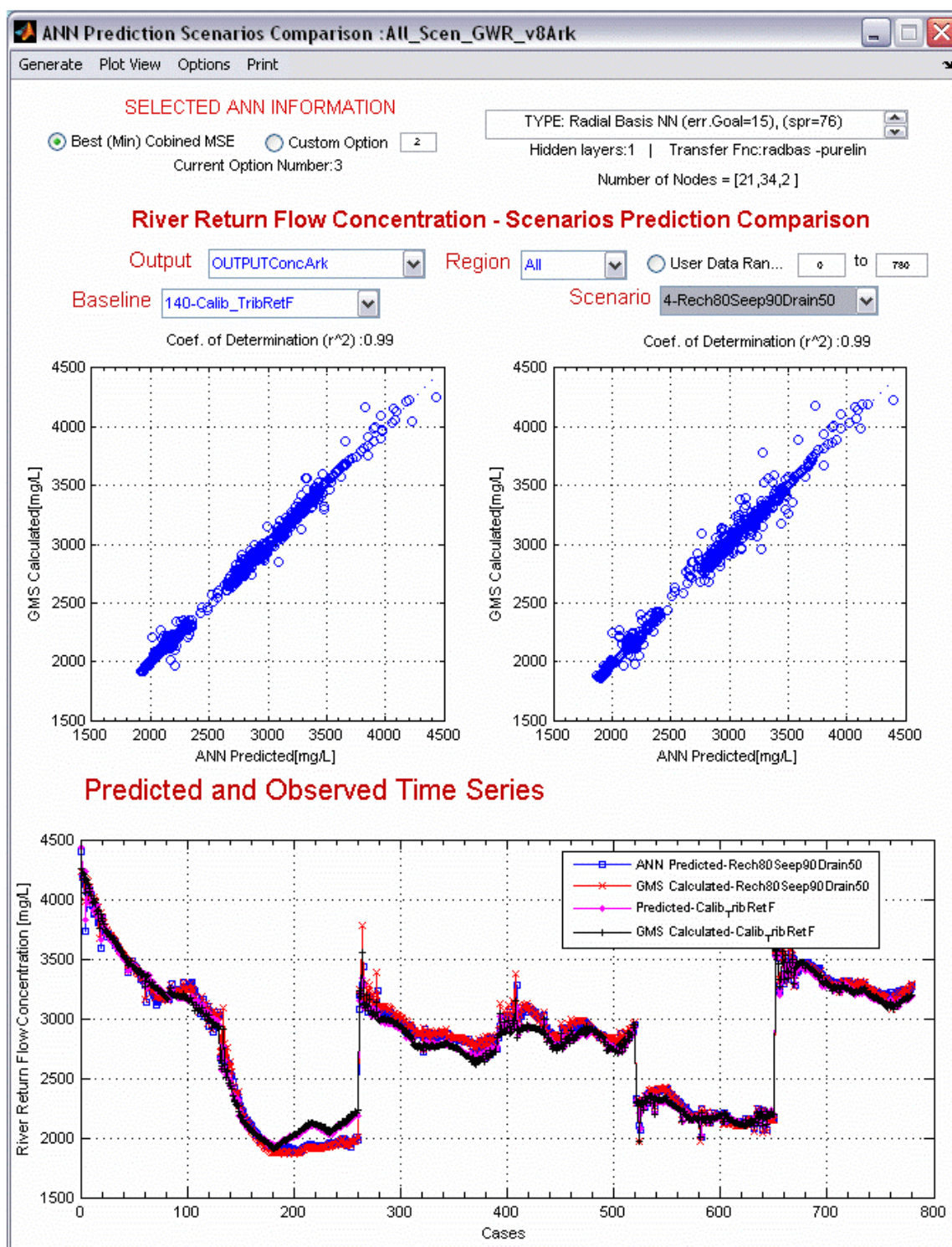
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## Arkansas River – Stream-Aquifer Interaction Modeling



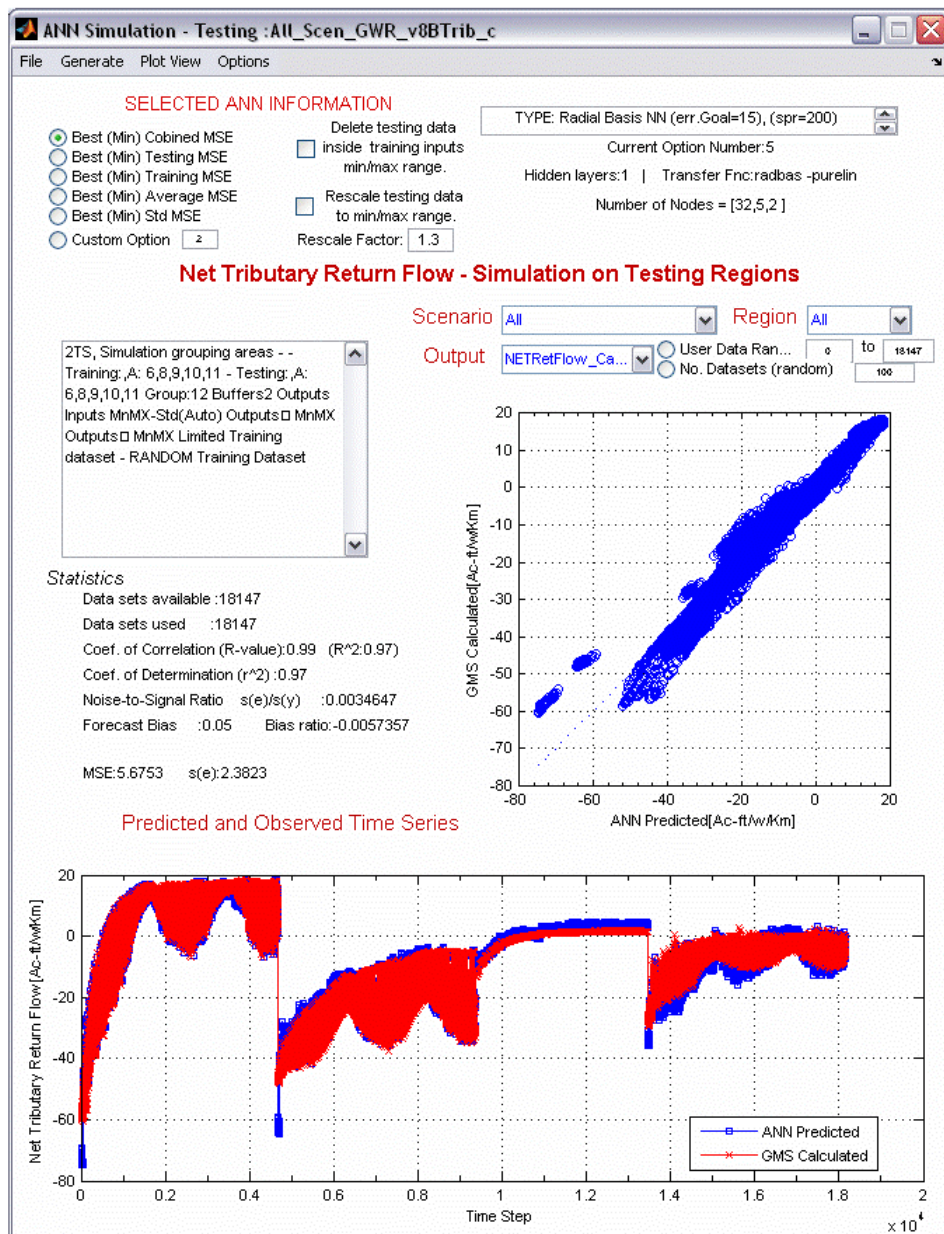


## AQUIFER-TRIBUTARIES INTERFACE MODELING

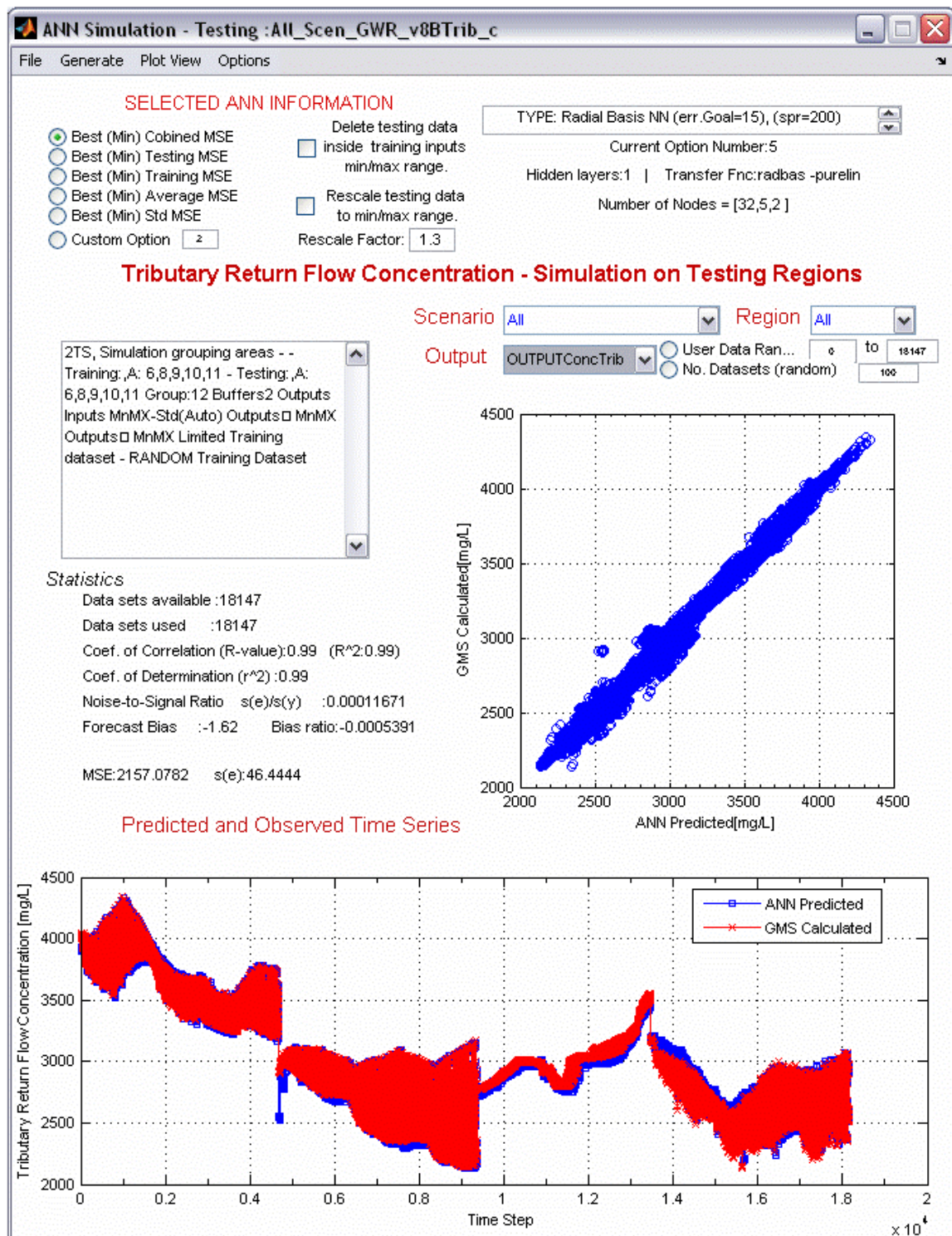
### All\_Scen\_GWR\_v8BTrib\_c Overall and Baseline Predictions Analysis

These reports correspond to the *All\_Scen\_GWR\_v8BTrib\_c* ANN predictions. These results are generated on cases that meet the filters on the training dataset (Figure 4.12).

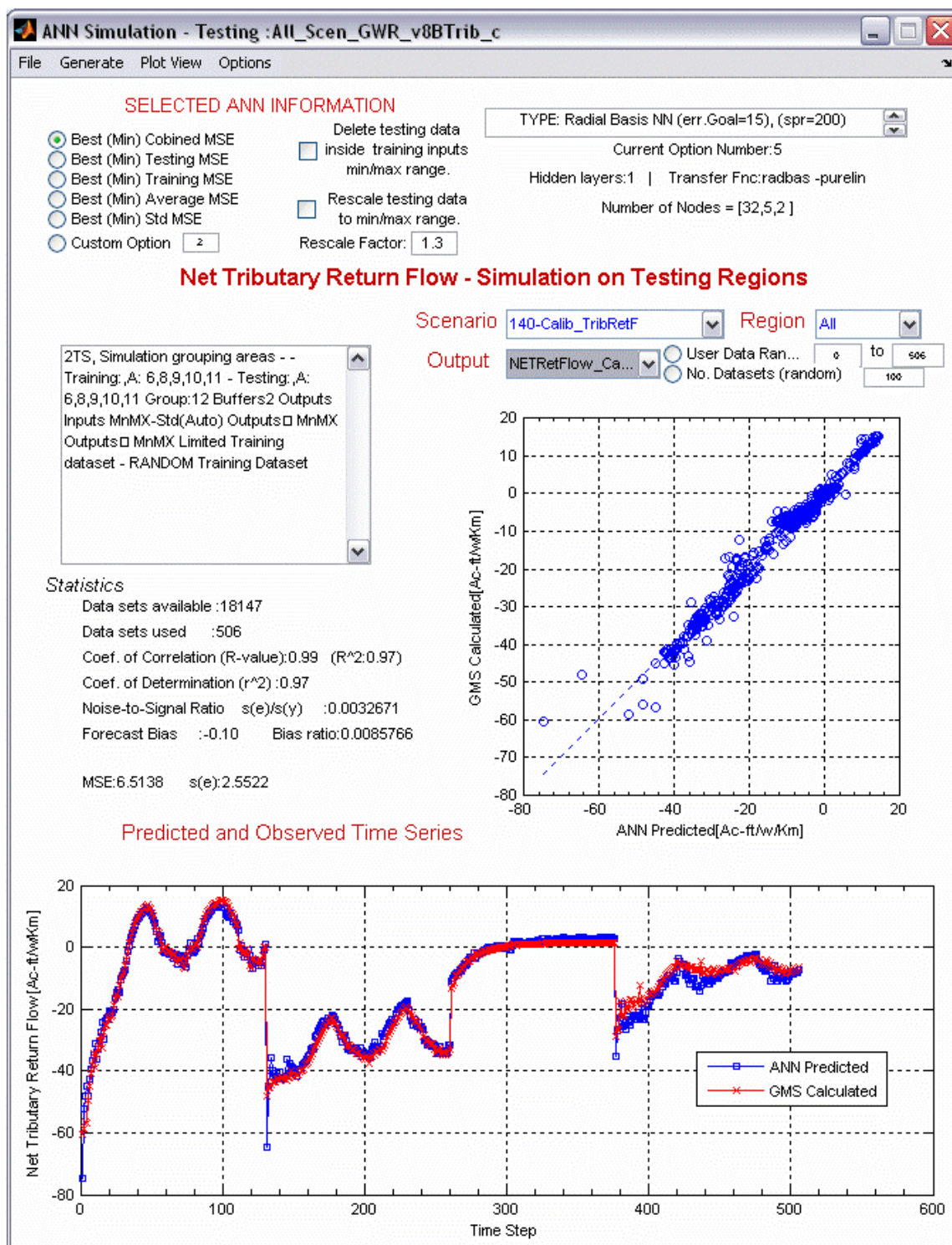
#### Tributary – Stream-Aquifer Interaction Modeling



## Tributary – Stream-Aquifer Interaction Modeling

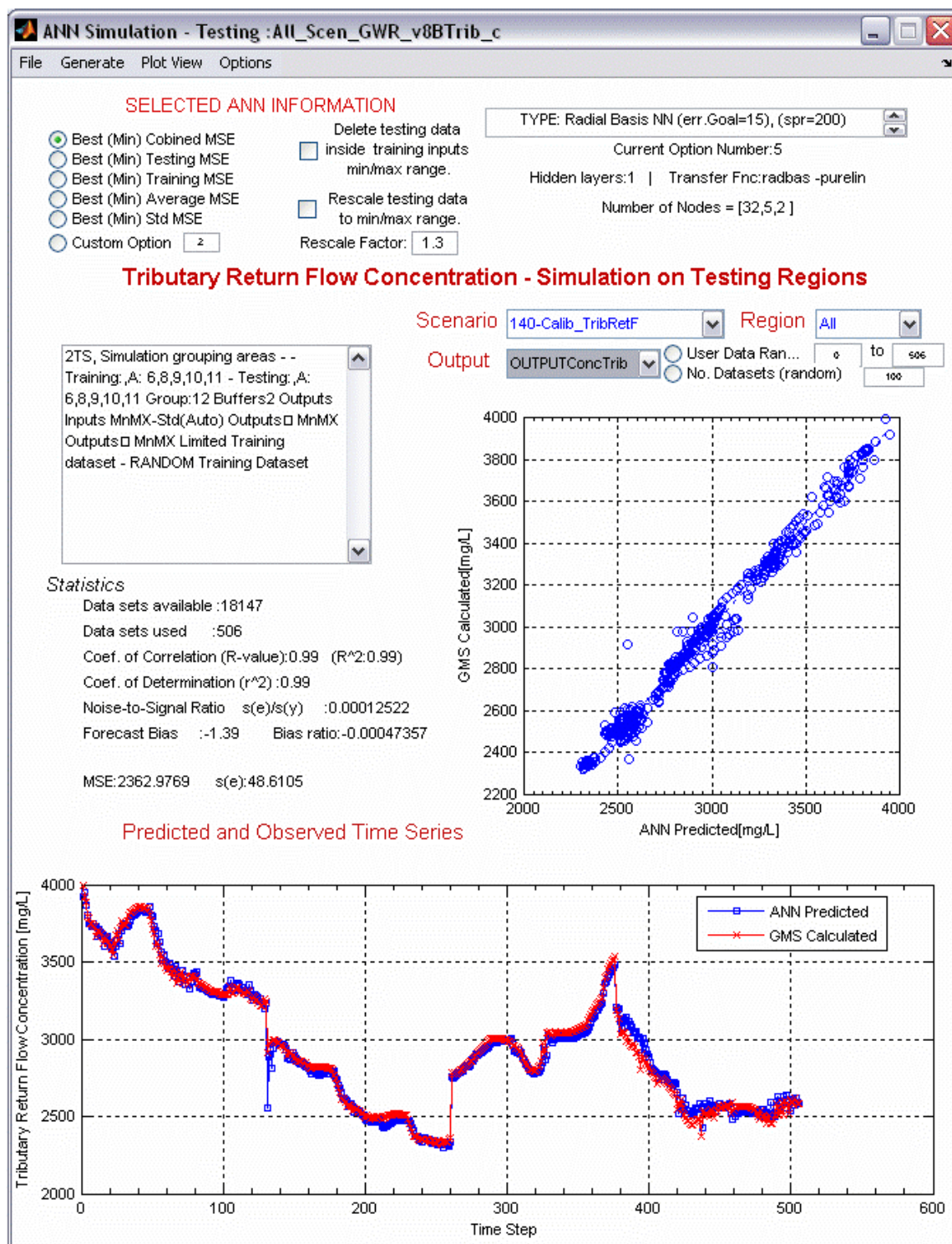


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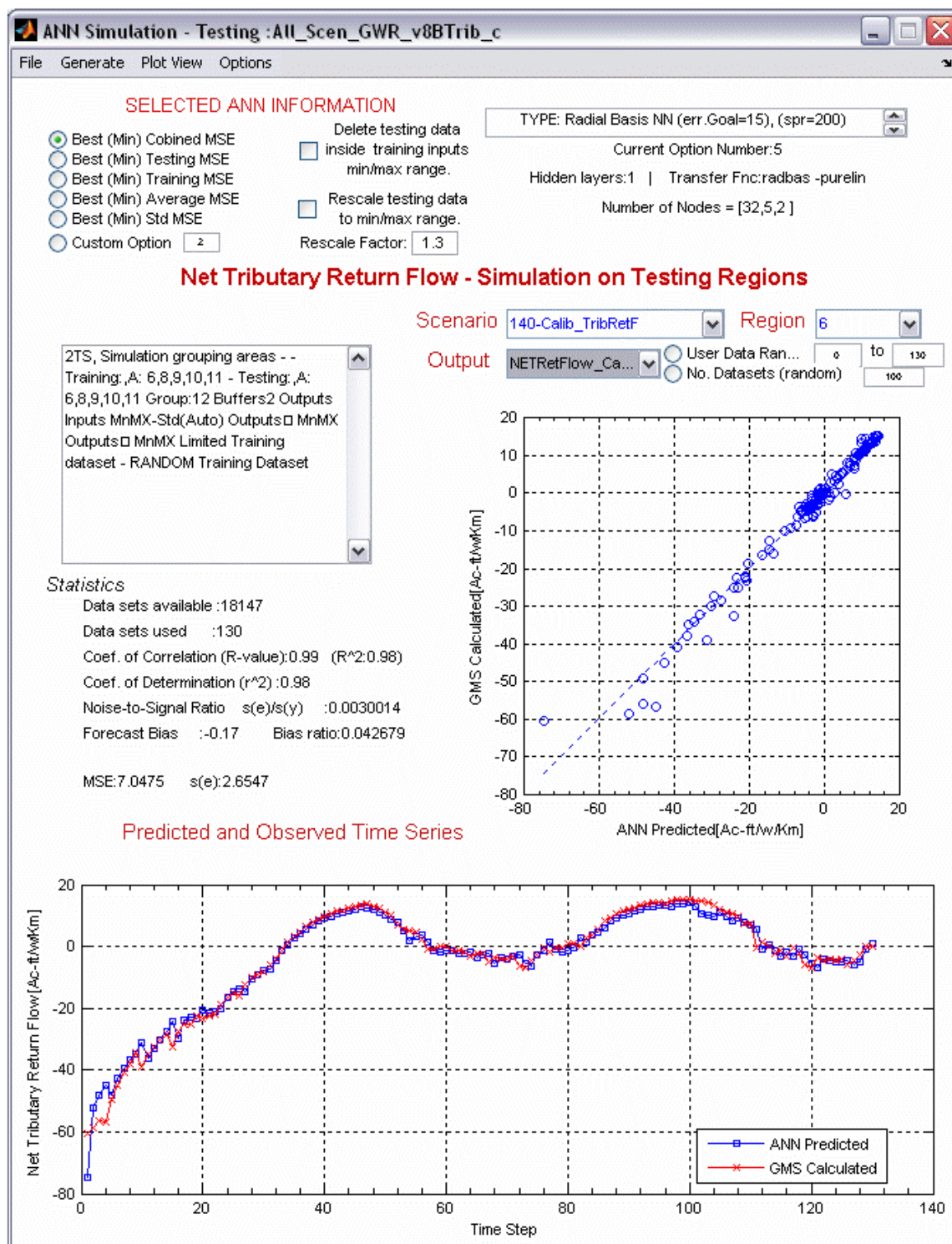




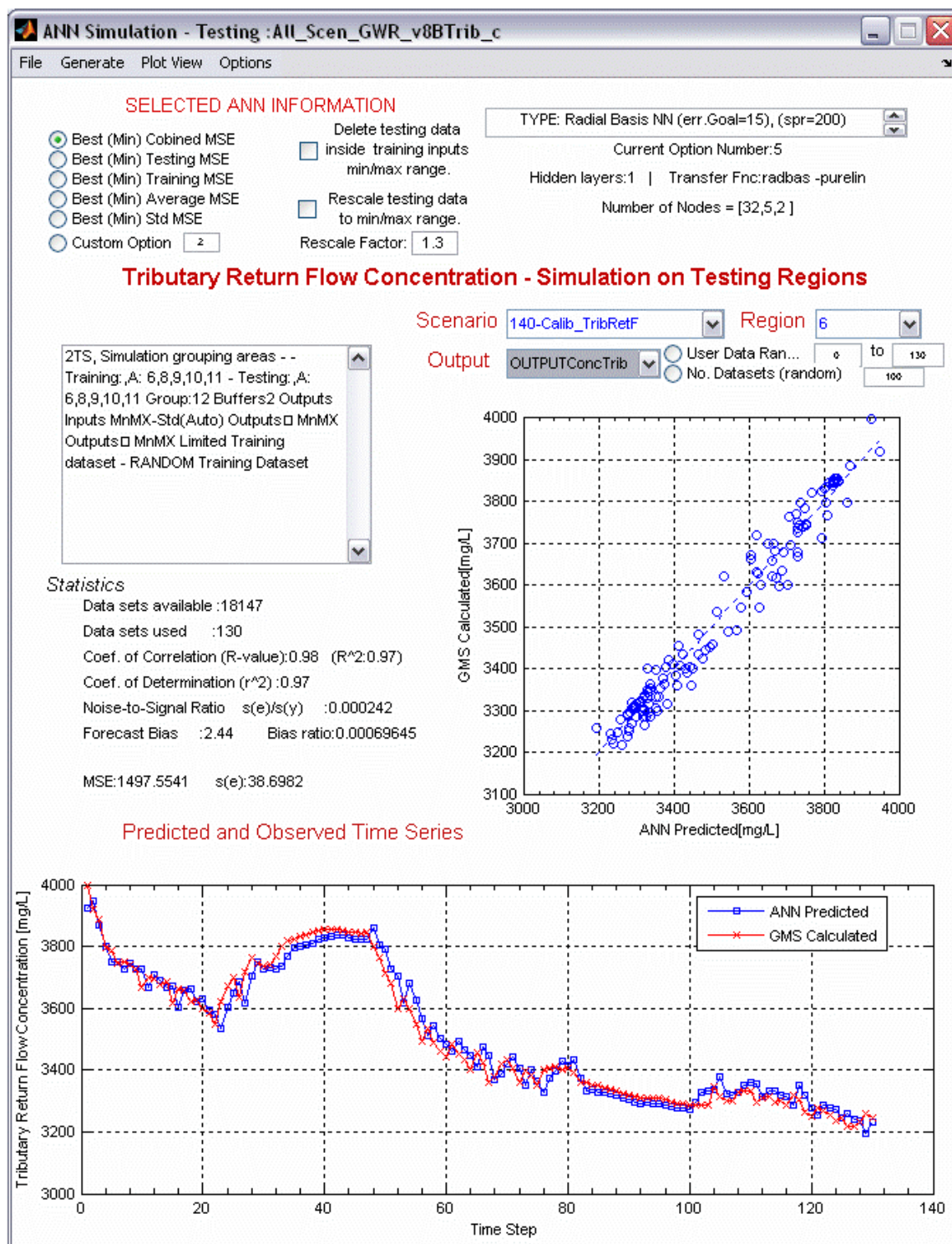
## Tributary – Stream-Aquifer Interaction Modeling



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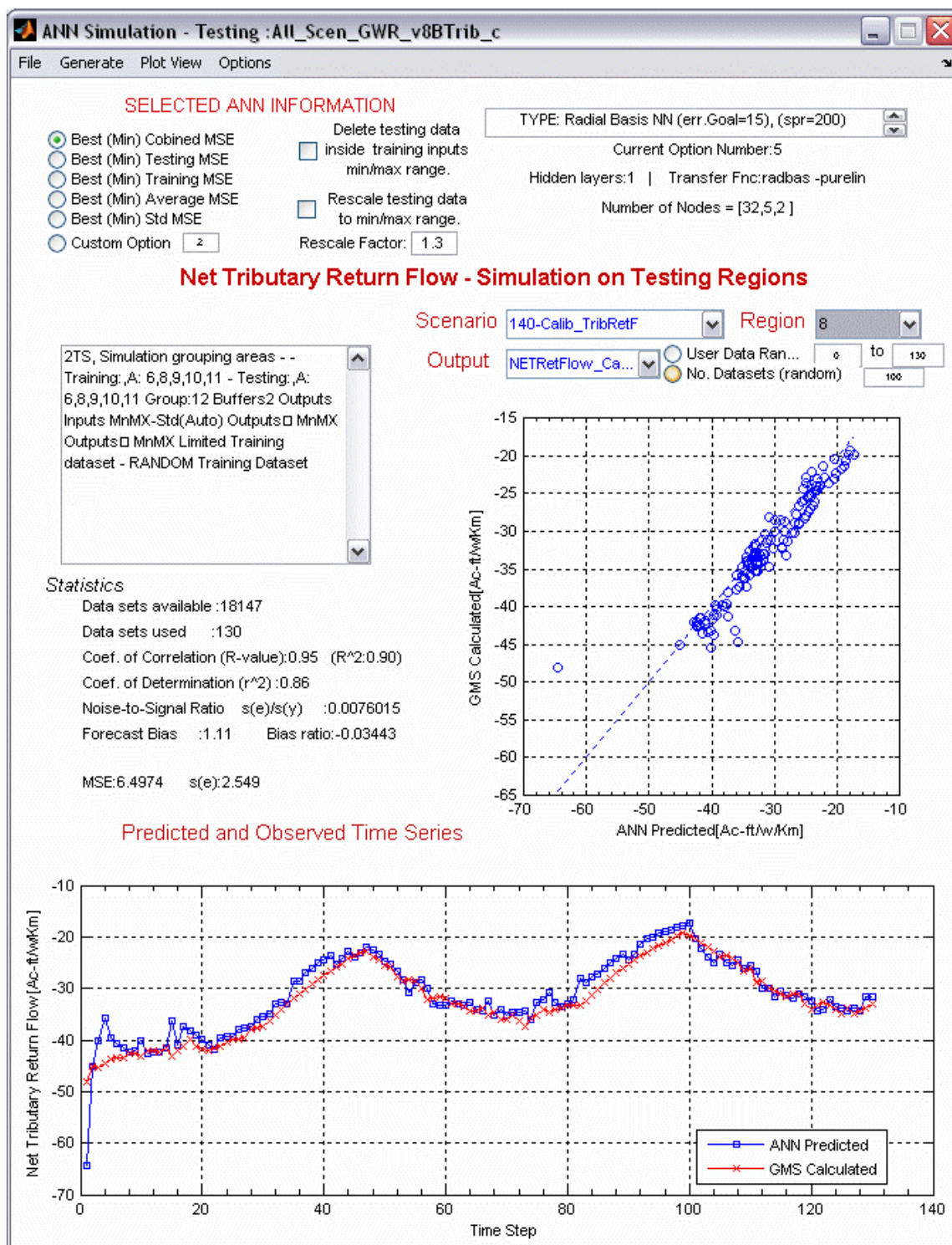


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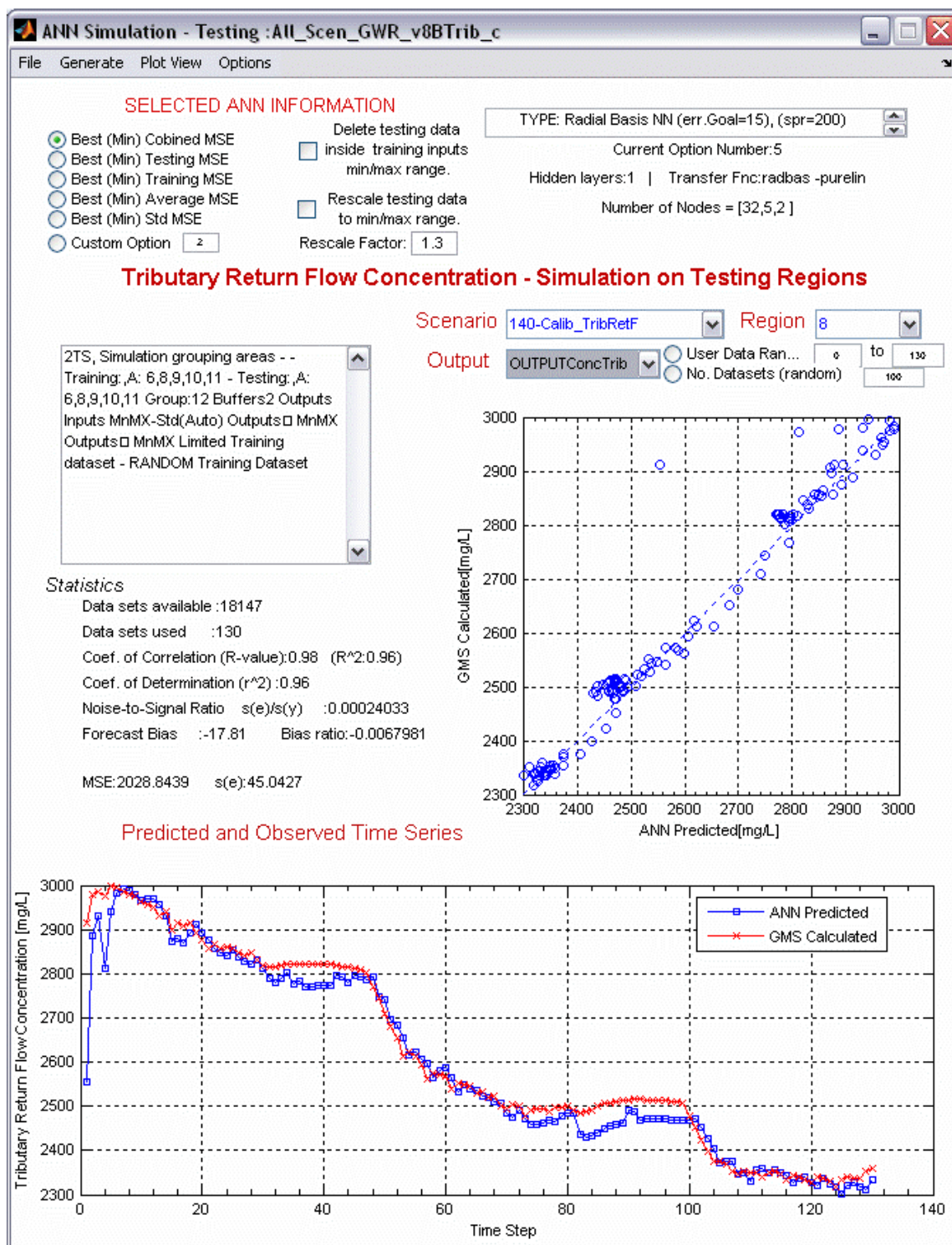




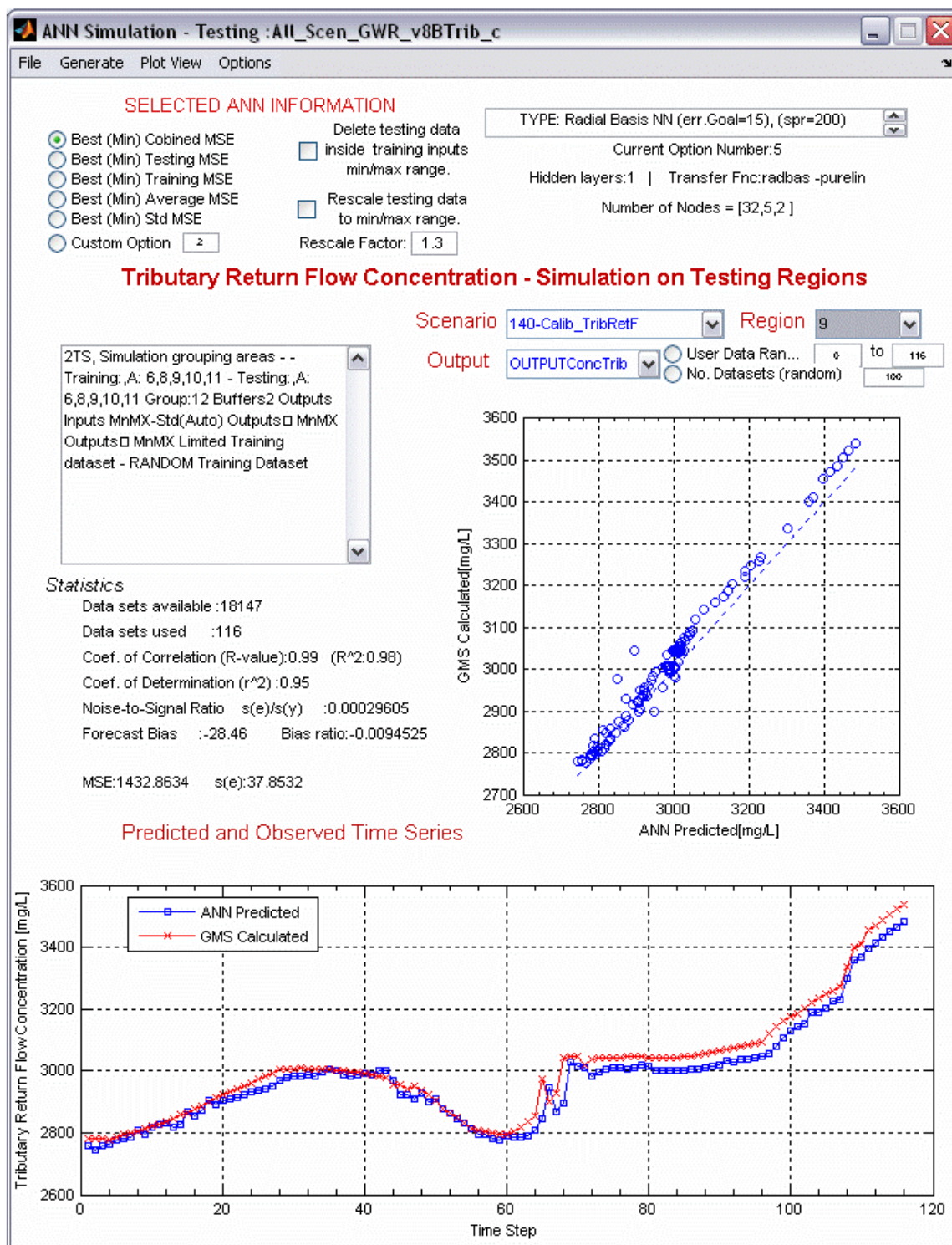
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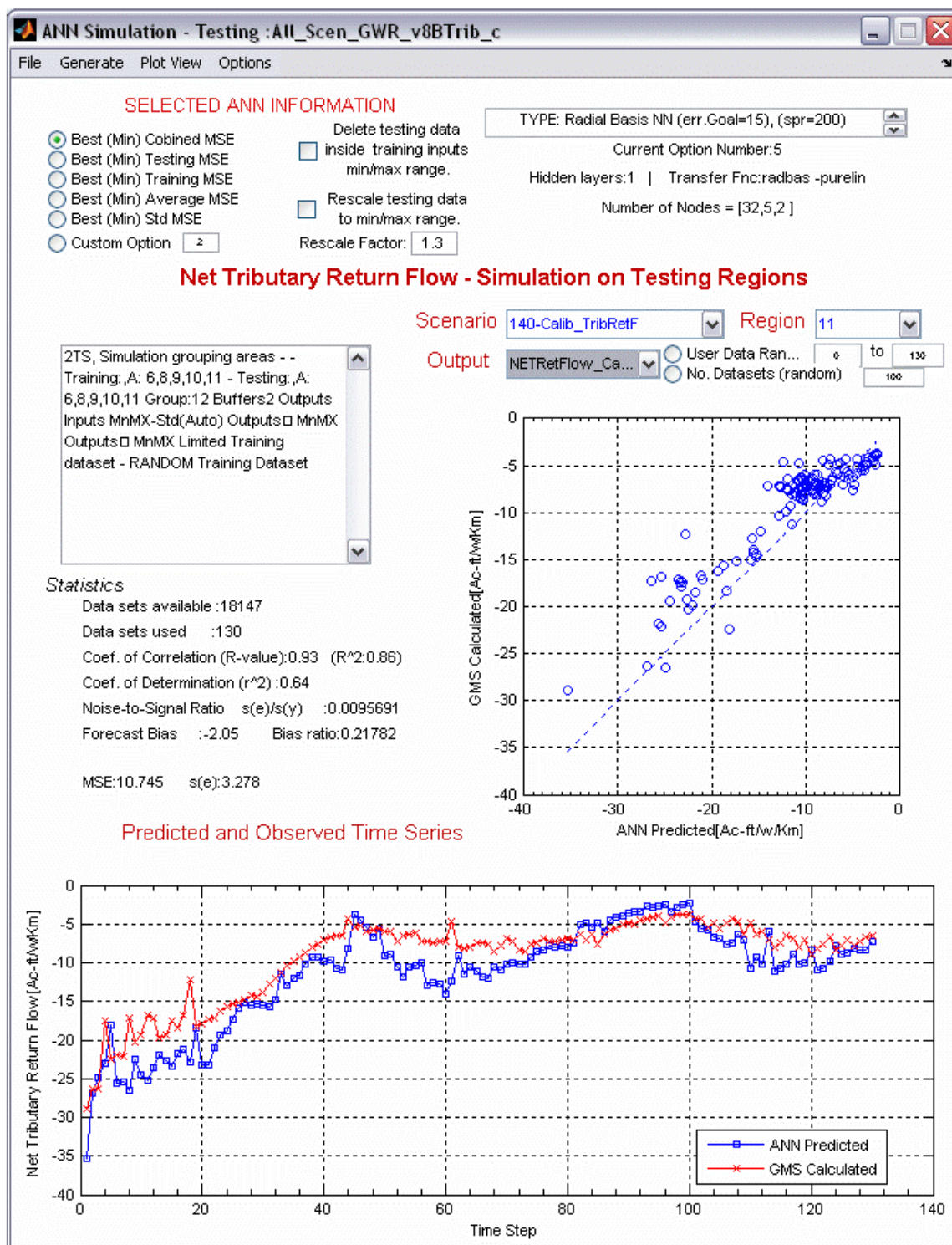


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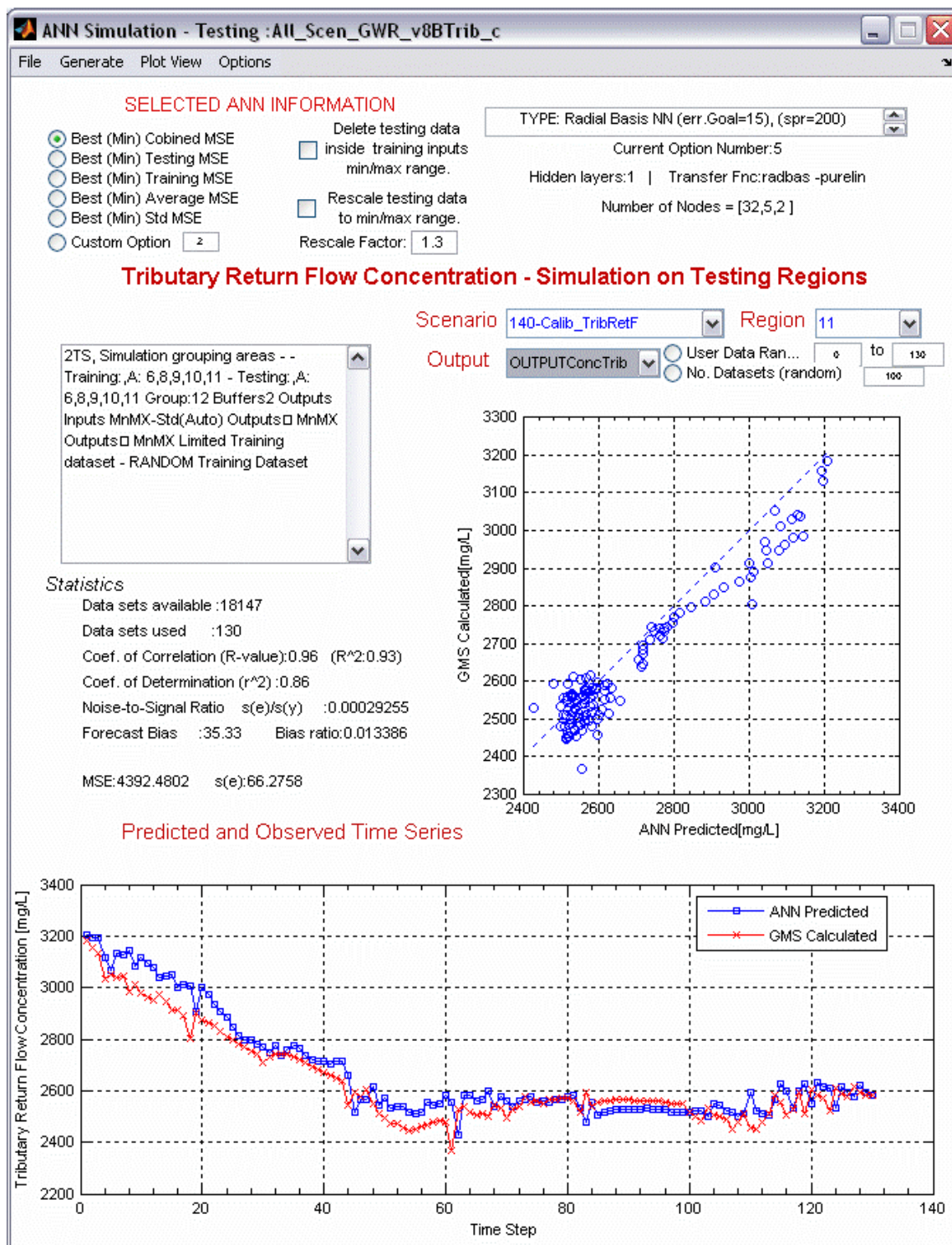




## Tributary – Stream-Aquifer Interaction Modeling



## Tributary – Stream-Aquifer Interaction Modeling

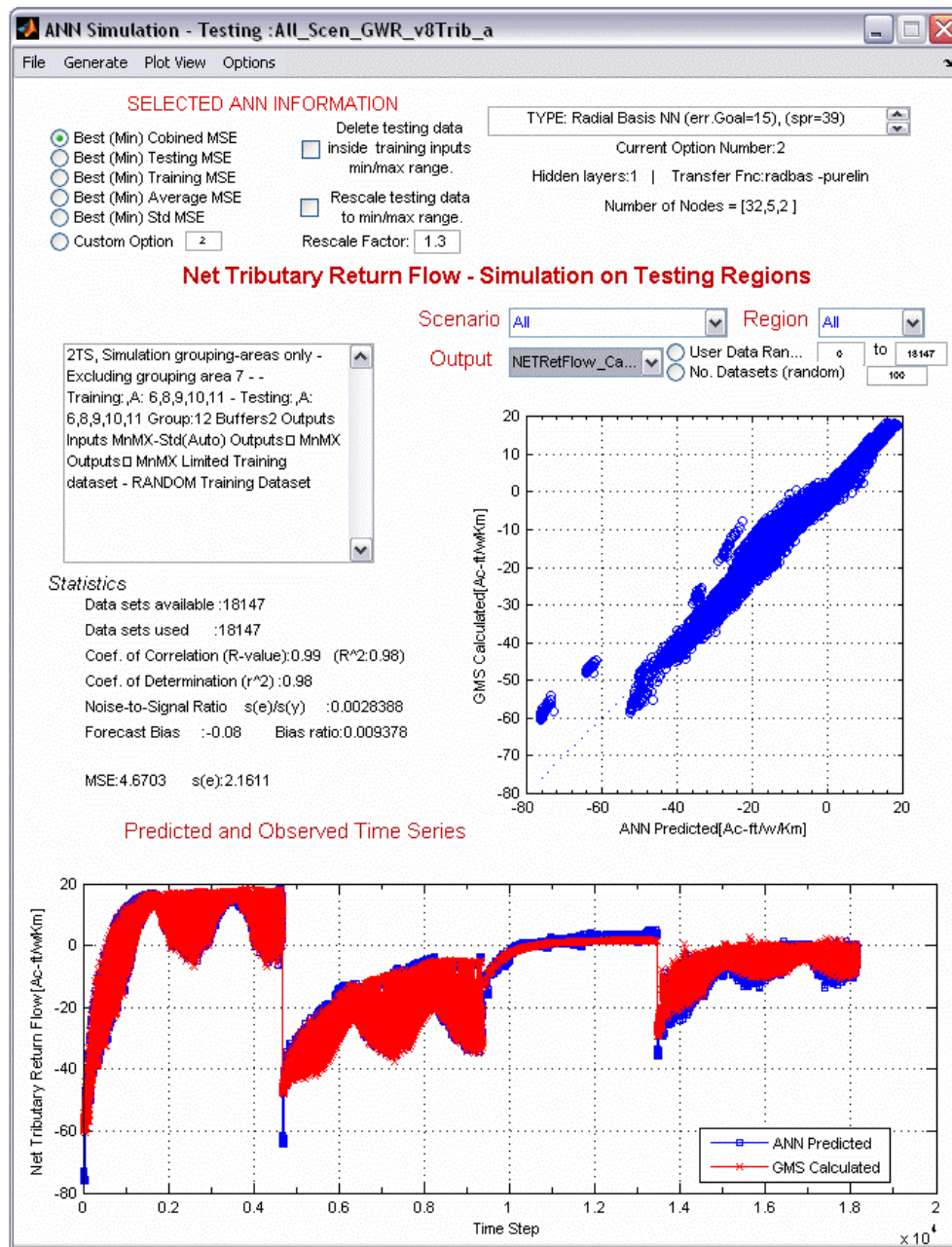


### All\_Scen\_GWR\_v8Trib\_a Overall and Baseline Predictions Analysis

The following reports correspond to the *All\_Scen\_GWR\_v8Trib\_a* ANN predictions.

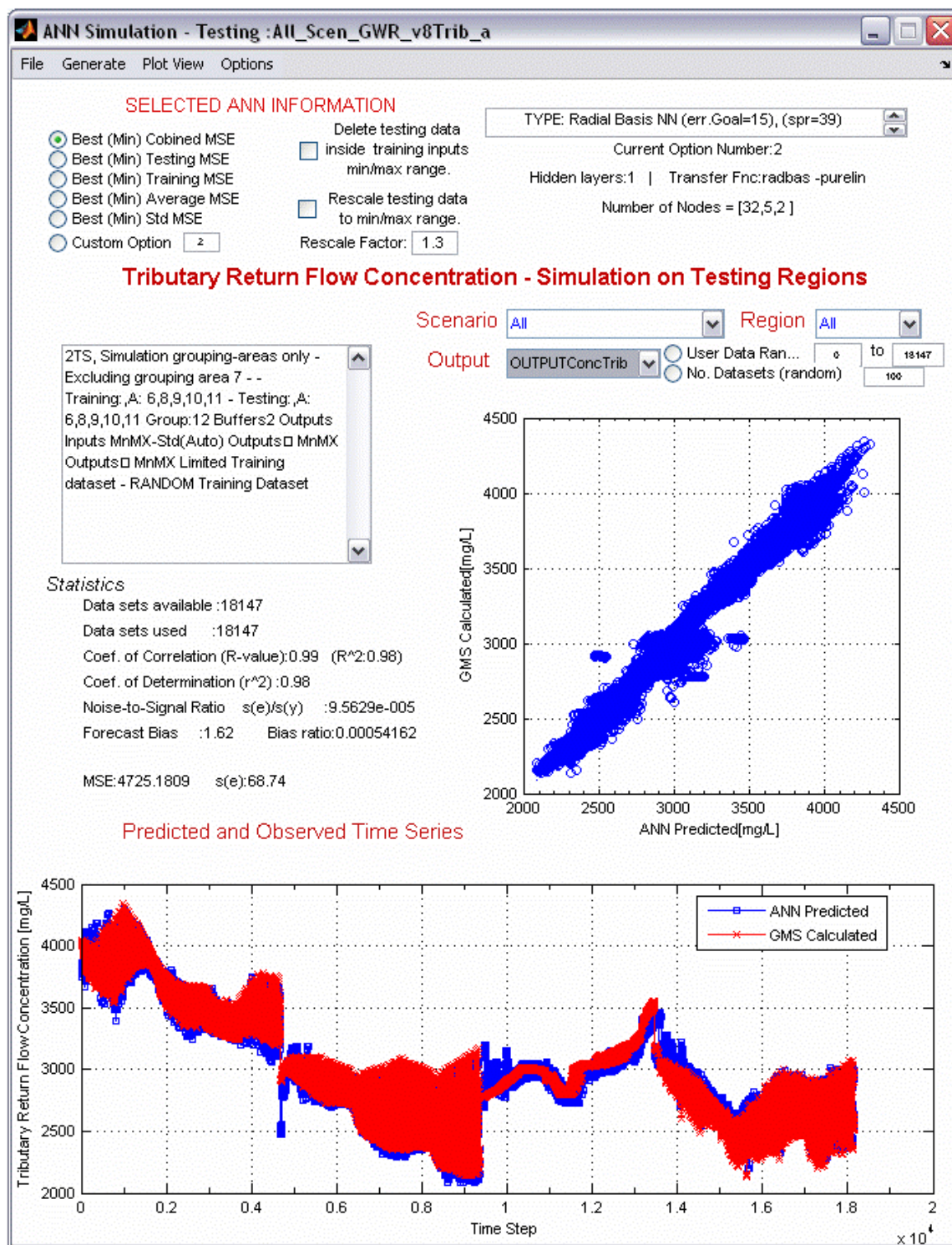
These results are generated on cases that meet the filters on the training dataset (Figure 4.24).

### Tributary – Stream-Aquifer Interaction Modeling

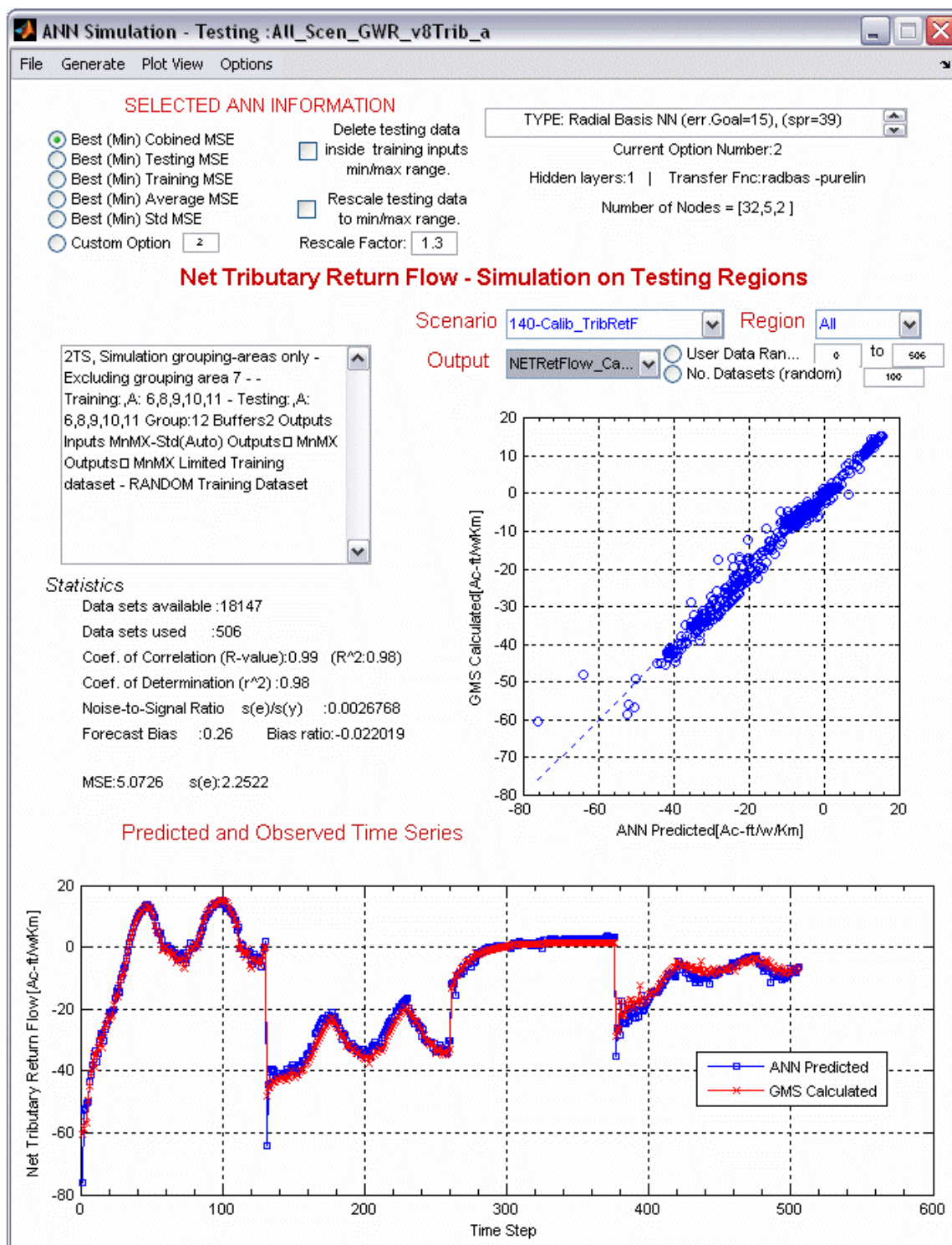




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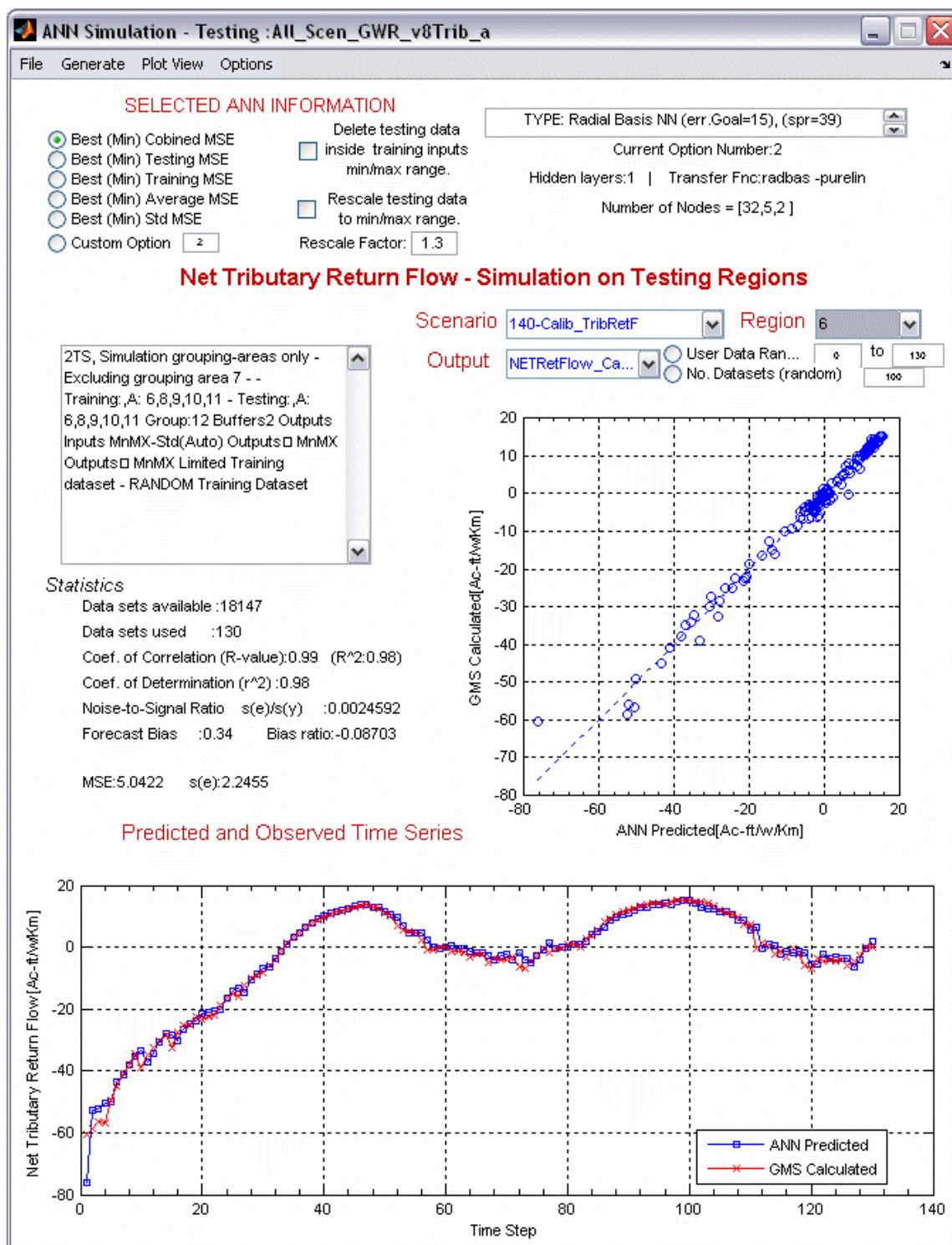
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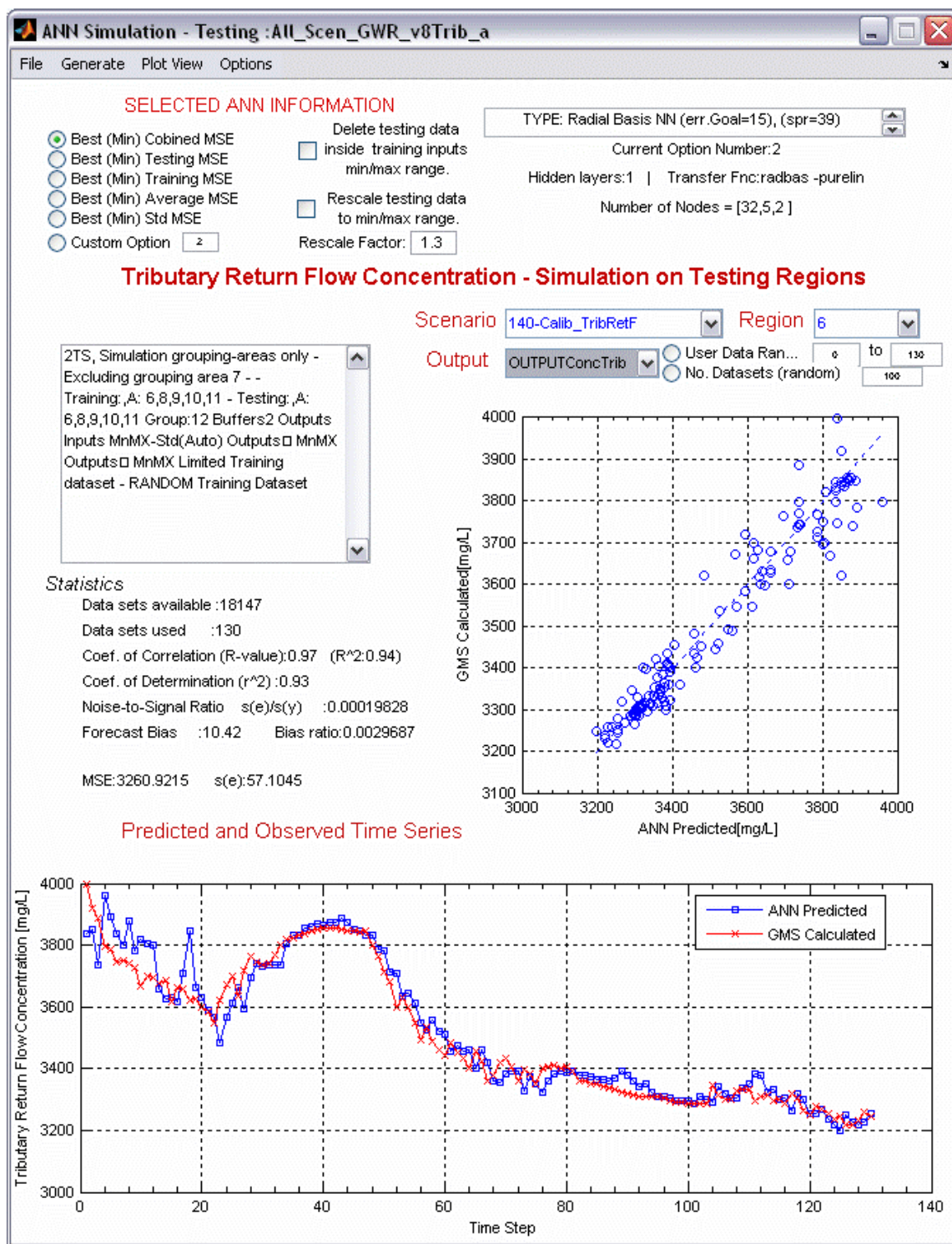




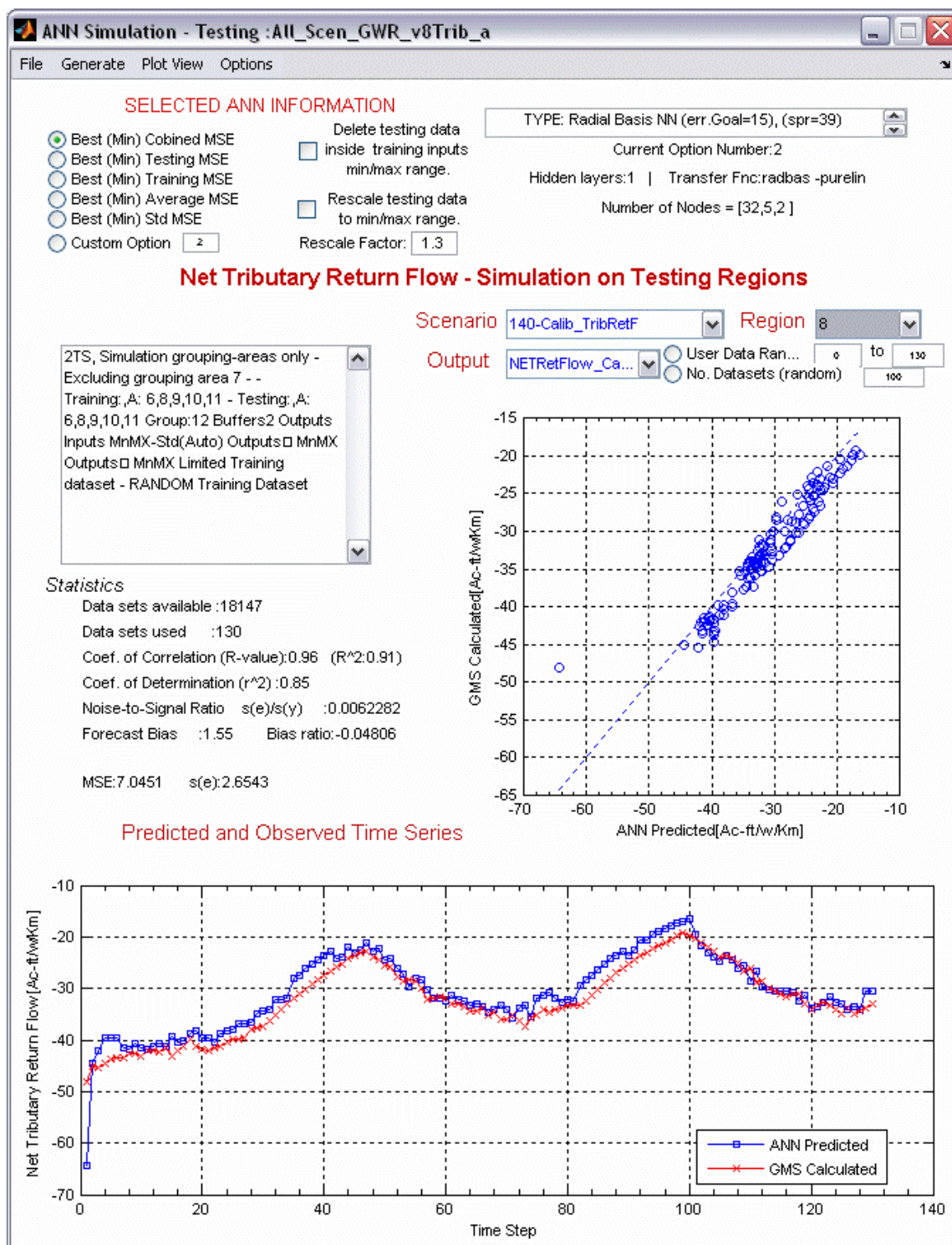
## Tributary – Stream-Aquifer Interaction Modeling



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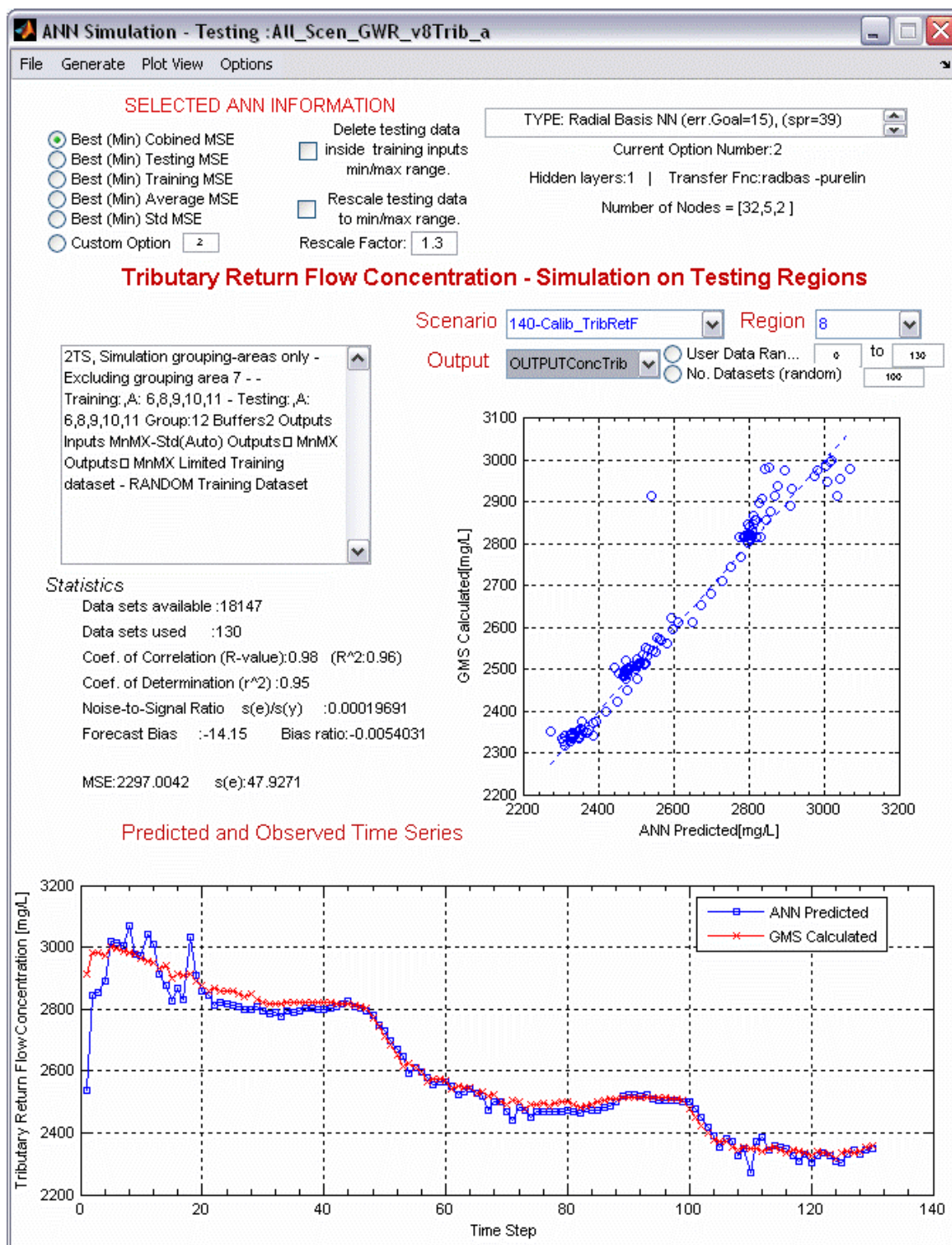


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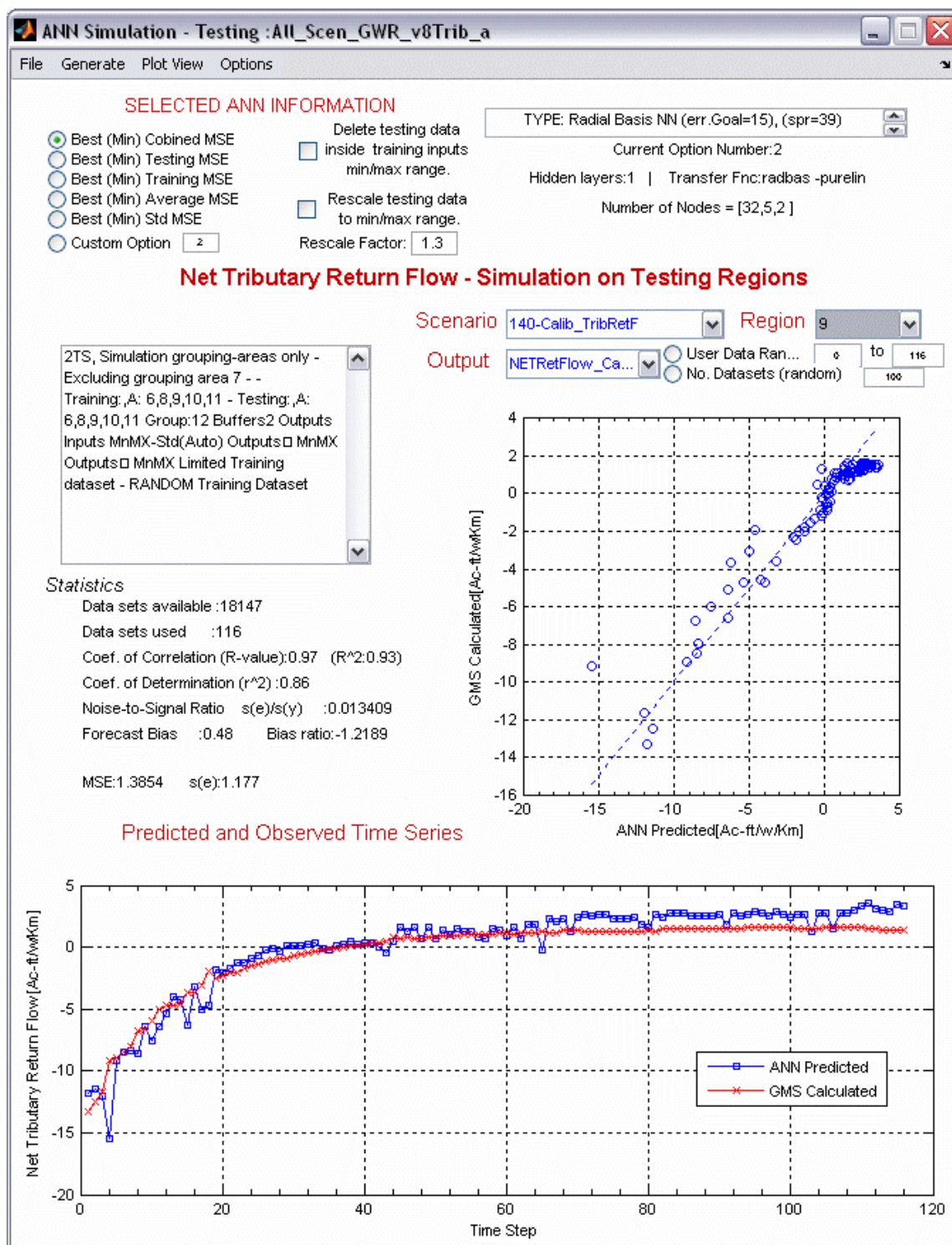




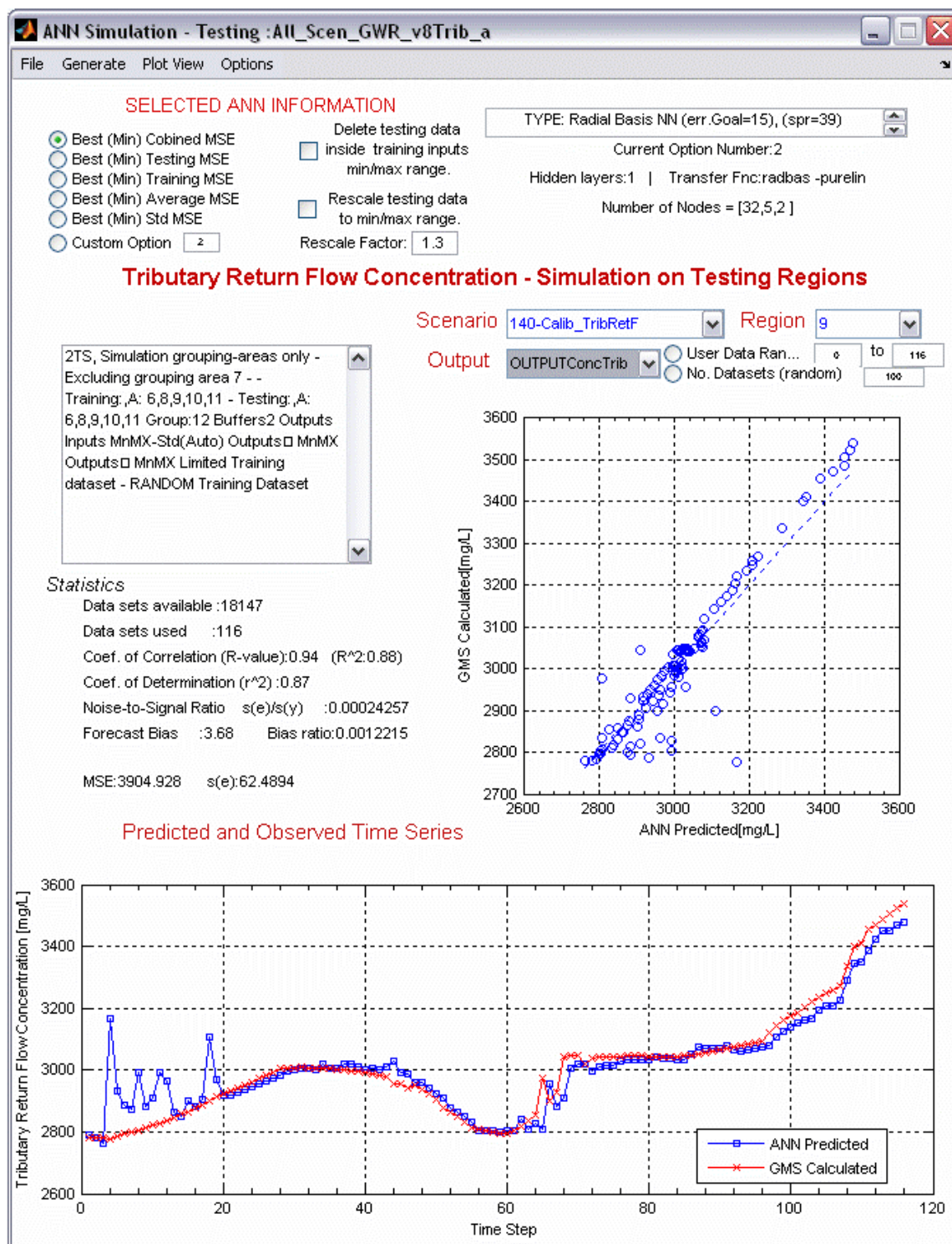
## Tributary – Stream-Aquifer Interaction Modeling



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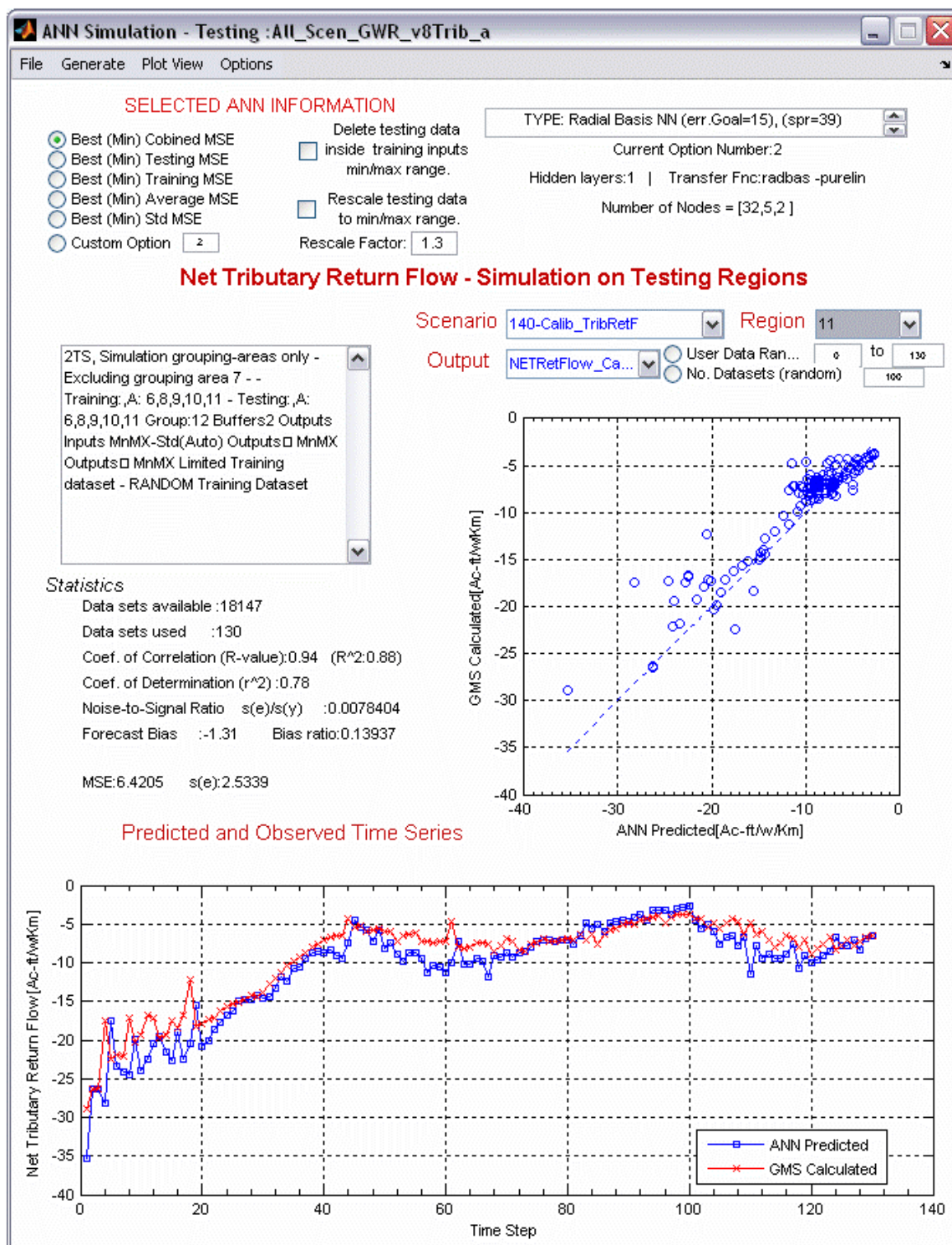


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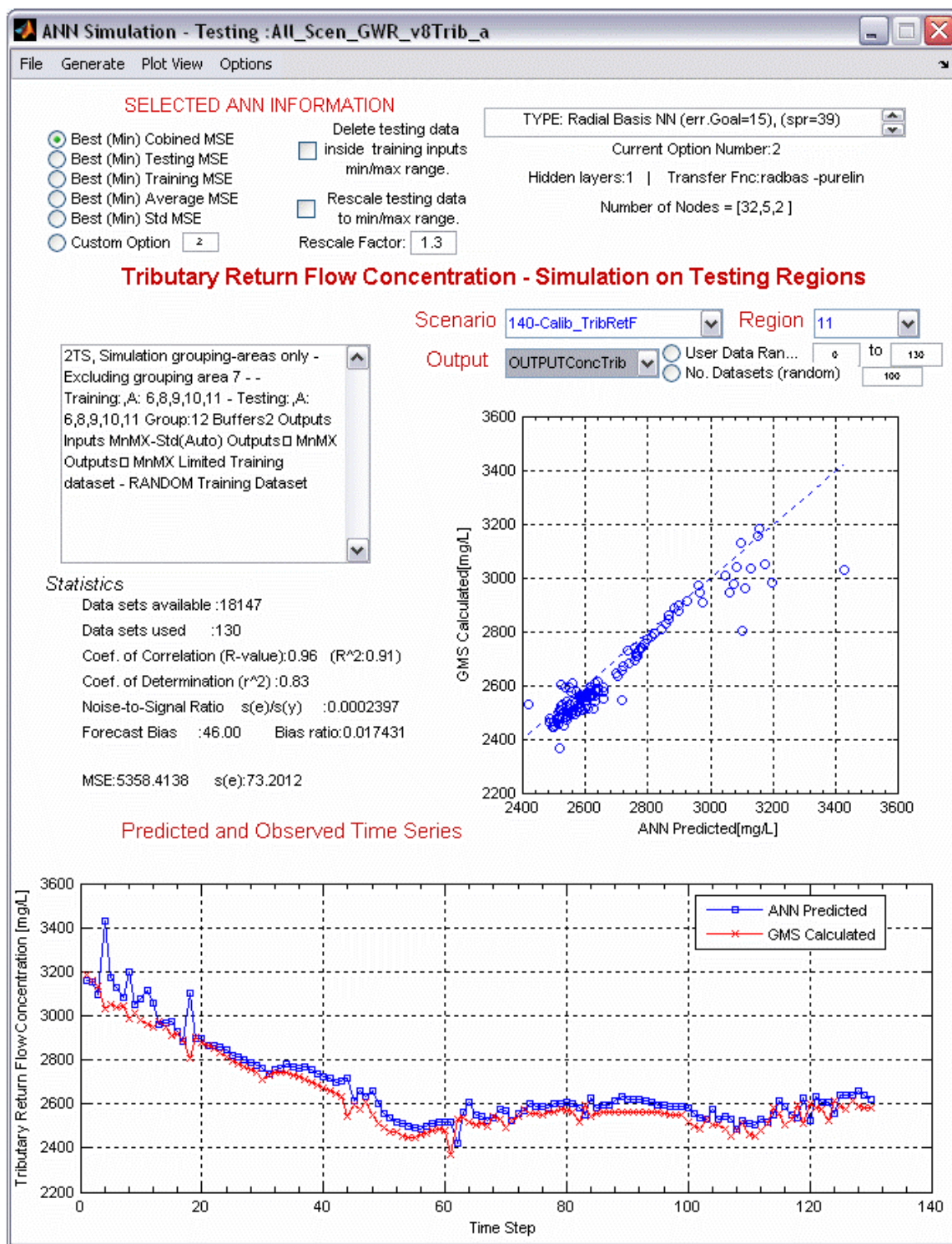




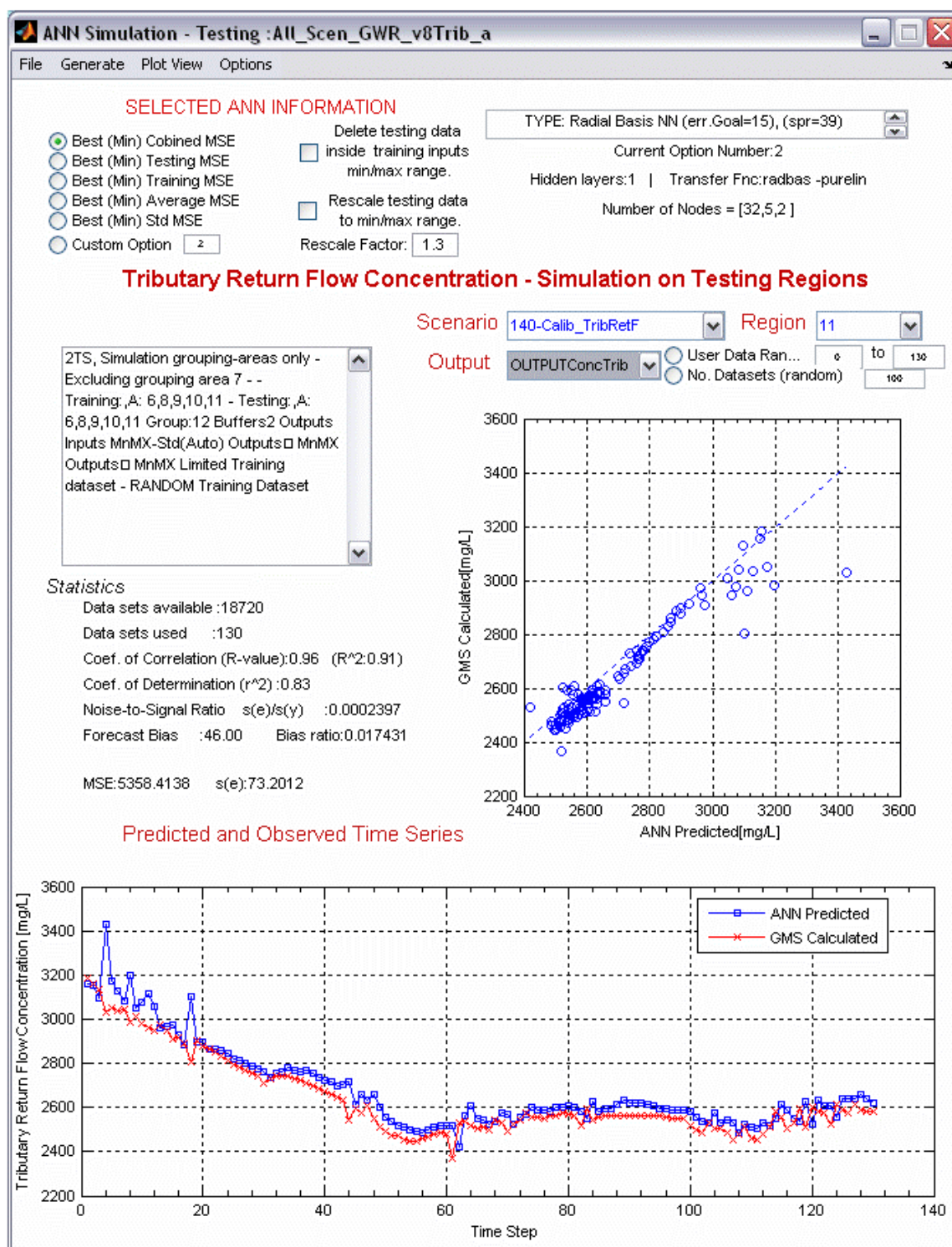
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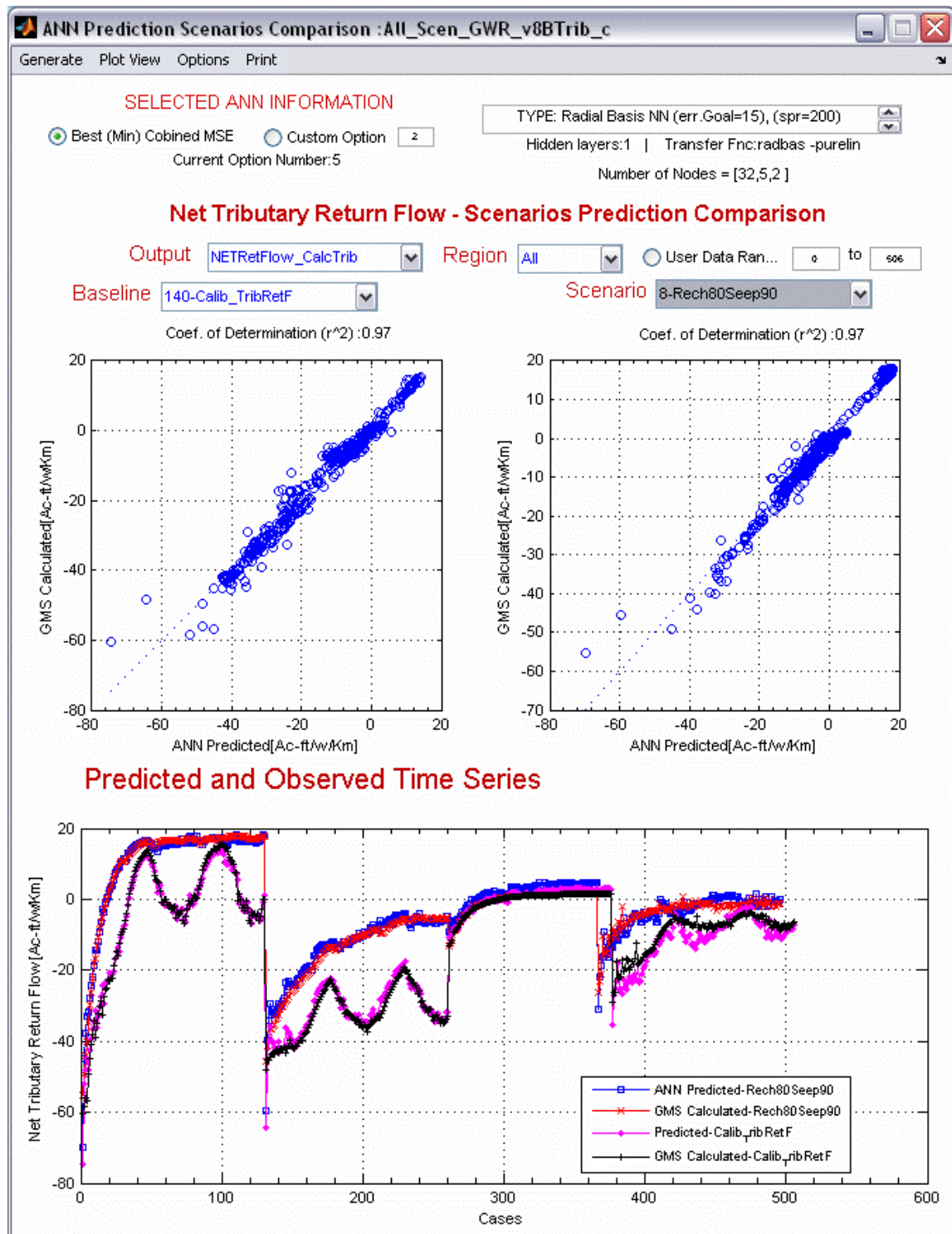




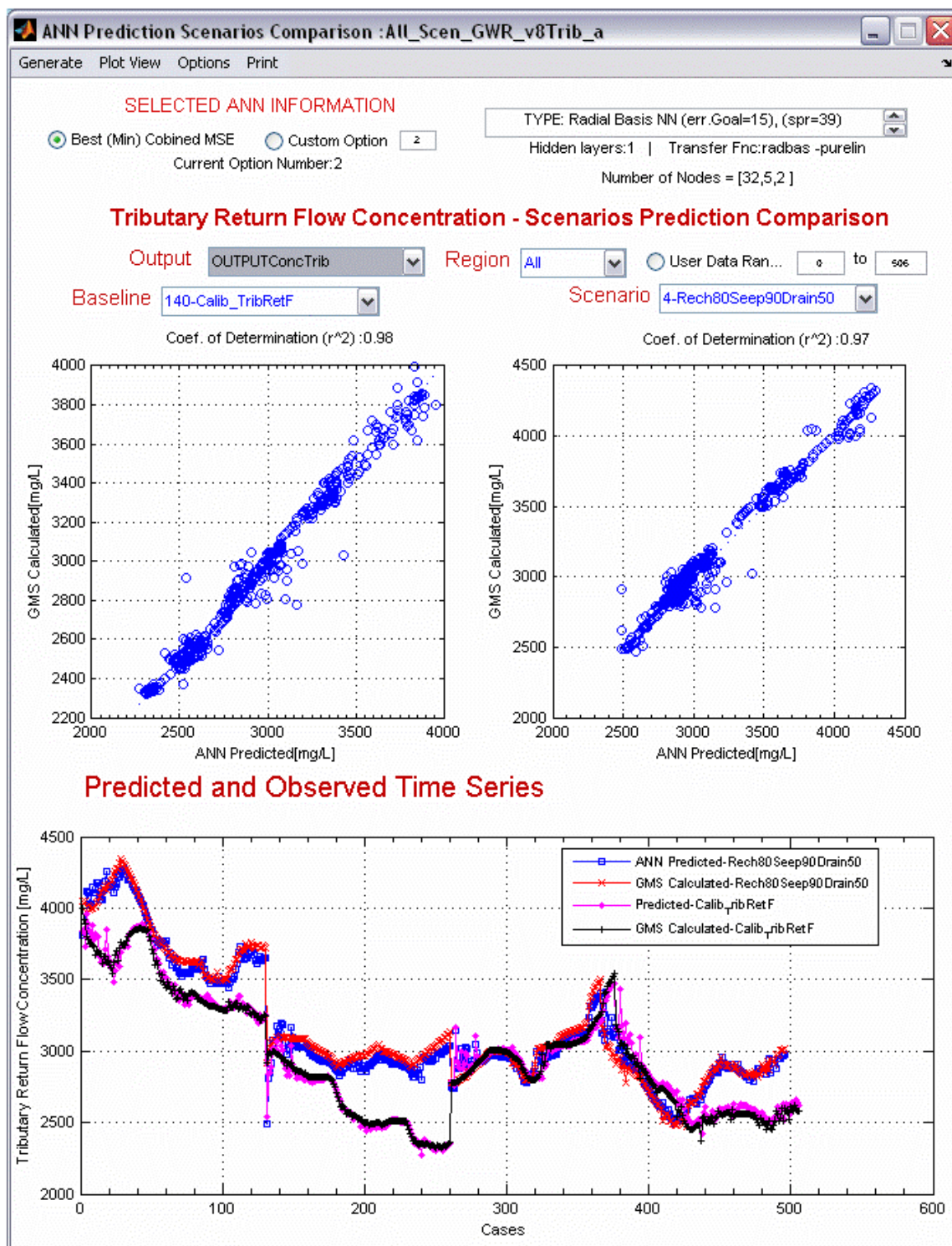
**All\_Scen\_GWR\_v8B Trib\_b ANN Baseline and Scenarios Selected Comparisons**

The following examples illustrate the side-by-side comparison of the predictions for baseline and selected scenarios to illustrate the accuracy between the modeled differences between the baseline and the scenarios and the ANN predicted differences. The filters apply to the data creates shifts between the baseline and scenarios prediction plotted as time series (different length of cases); therefore, caution should be use to interpret vertical sets of predictions.

## Tributary – Stream-Aquifer Interaction Modeling

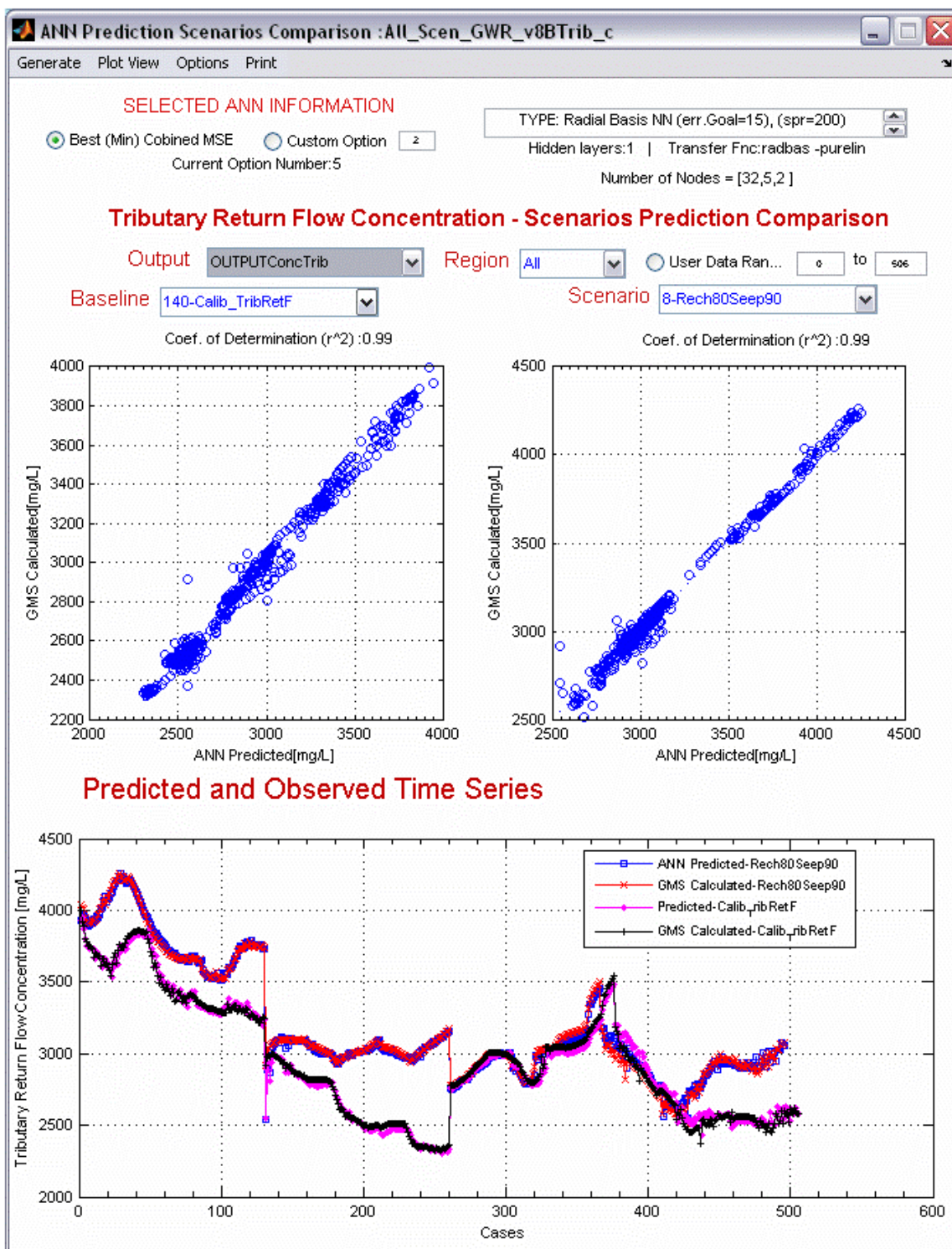


## Aquifer-Tributary Interaction Modeling

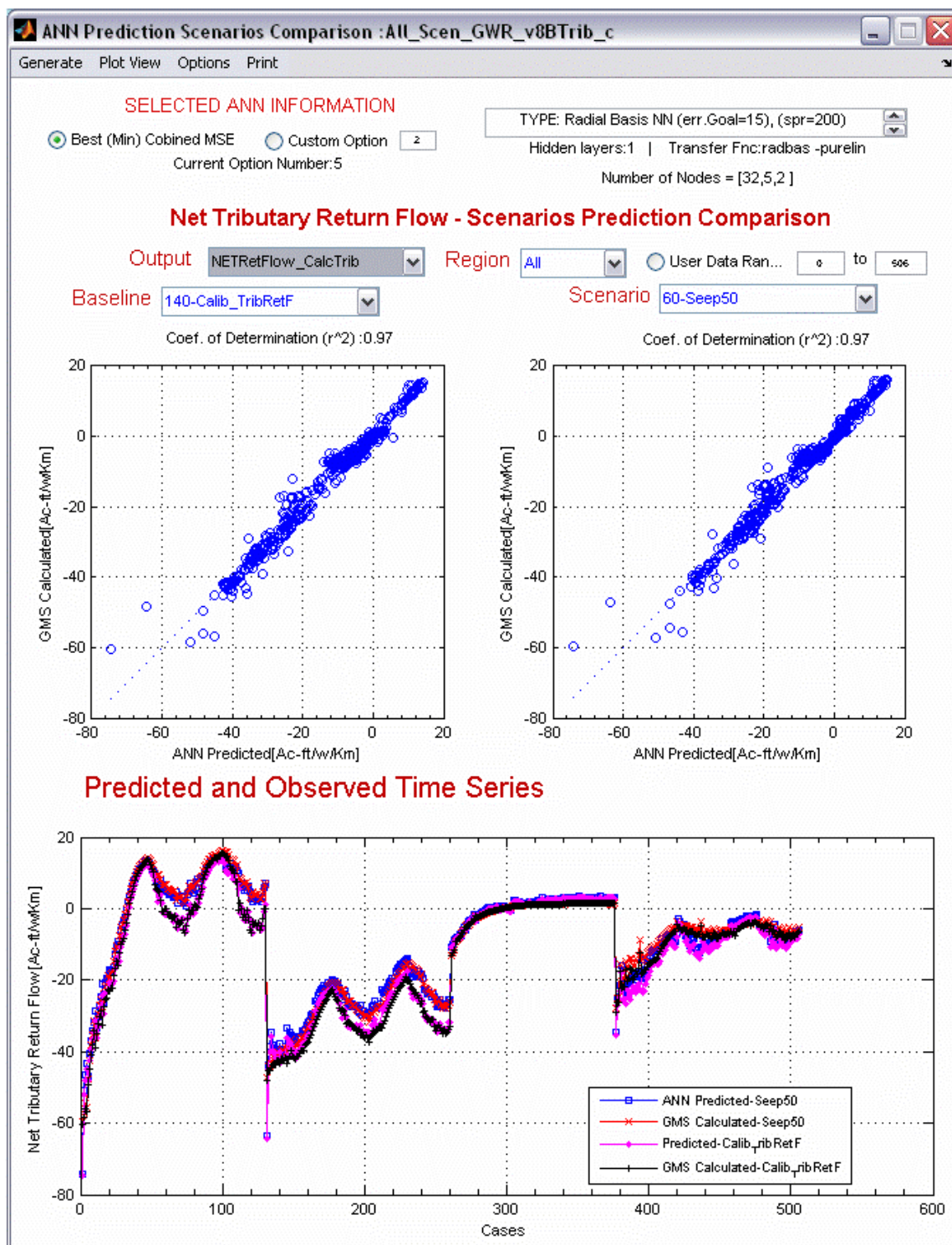




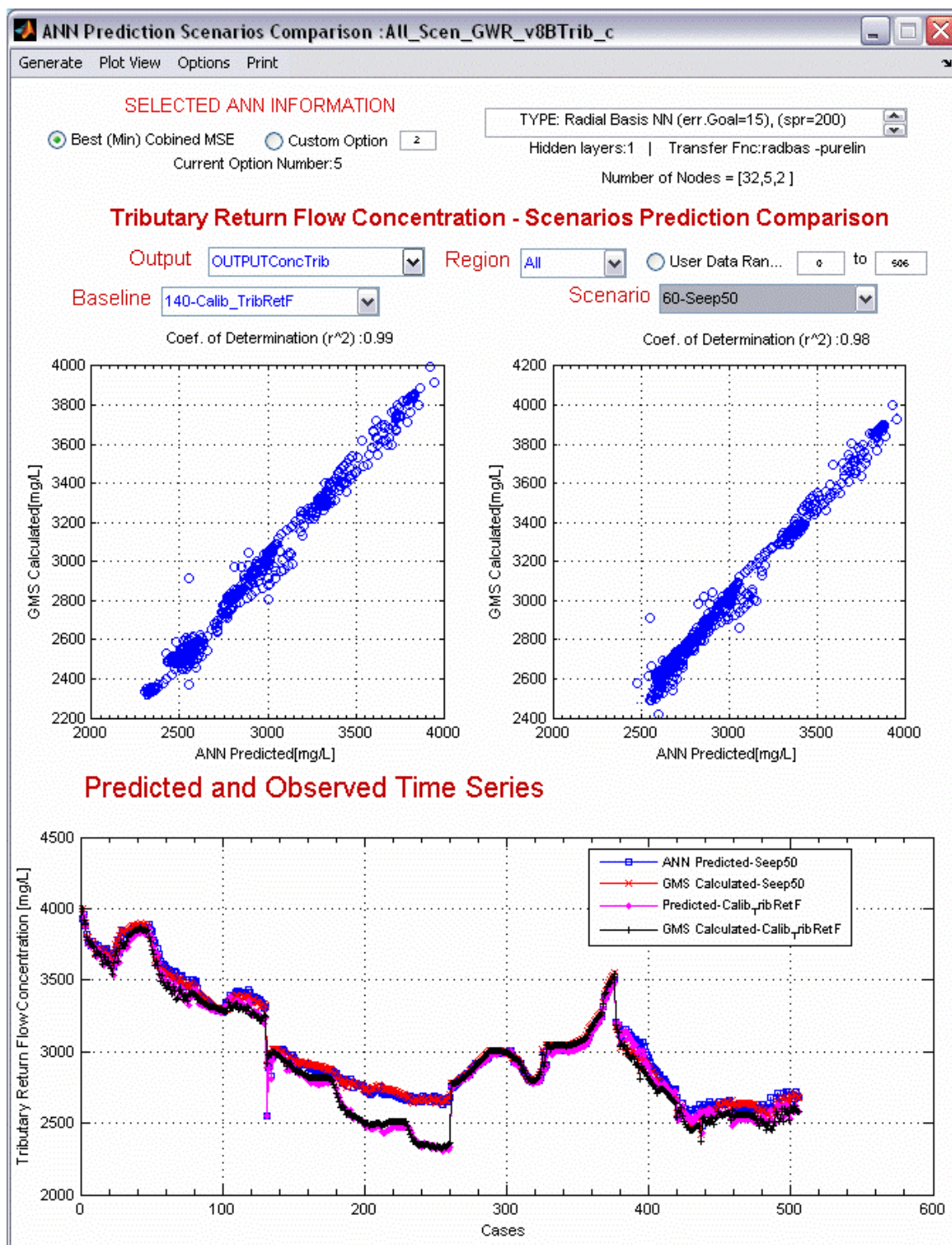
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## Tributary – Stream-Aquifer Interaction Modeling

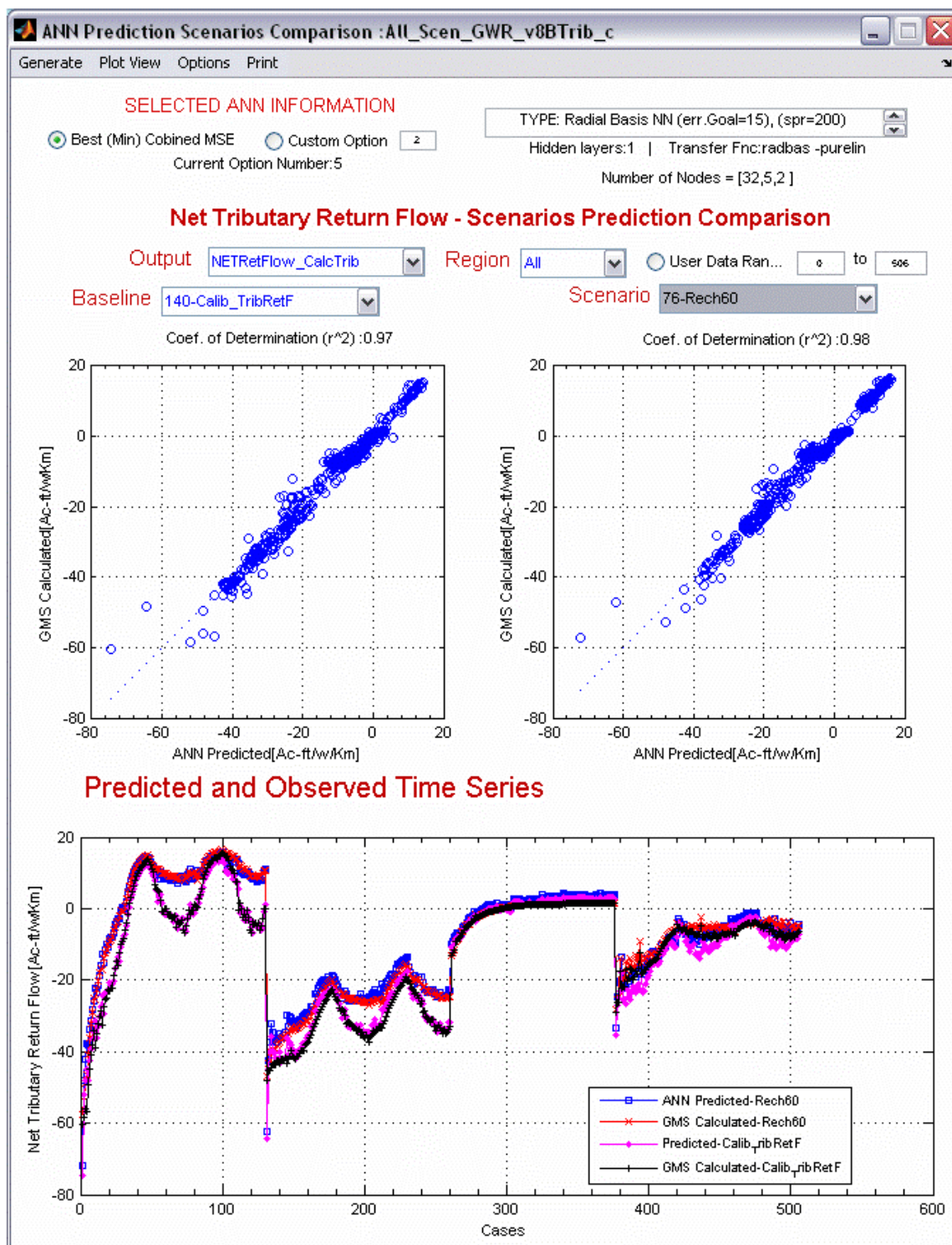


## Tributary – Stream-Aquifer Interaction Modeling

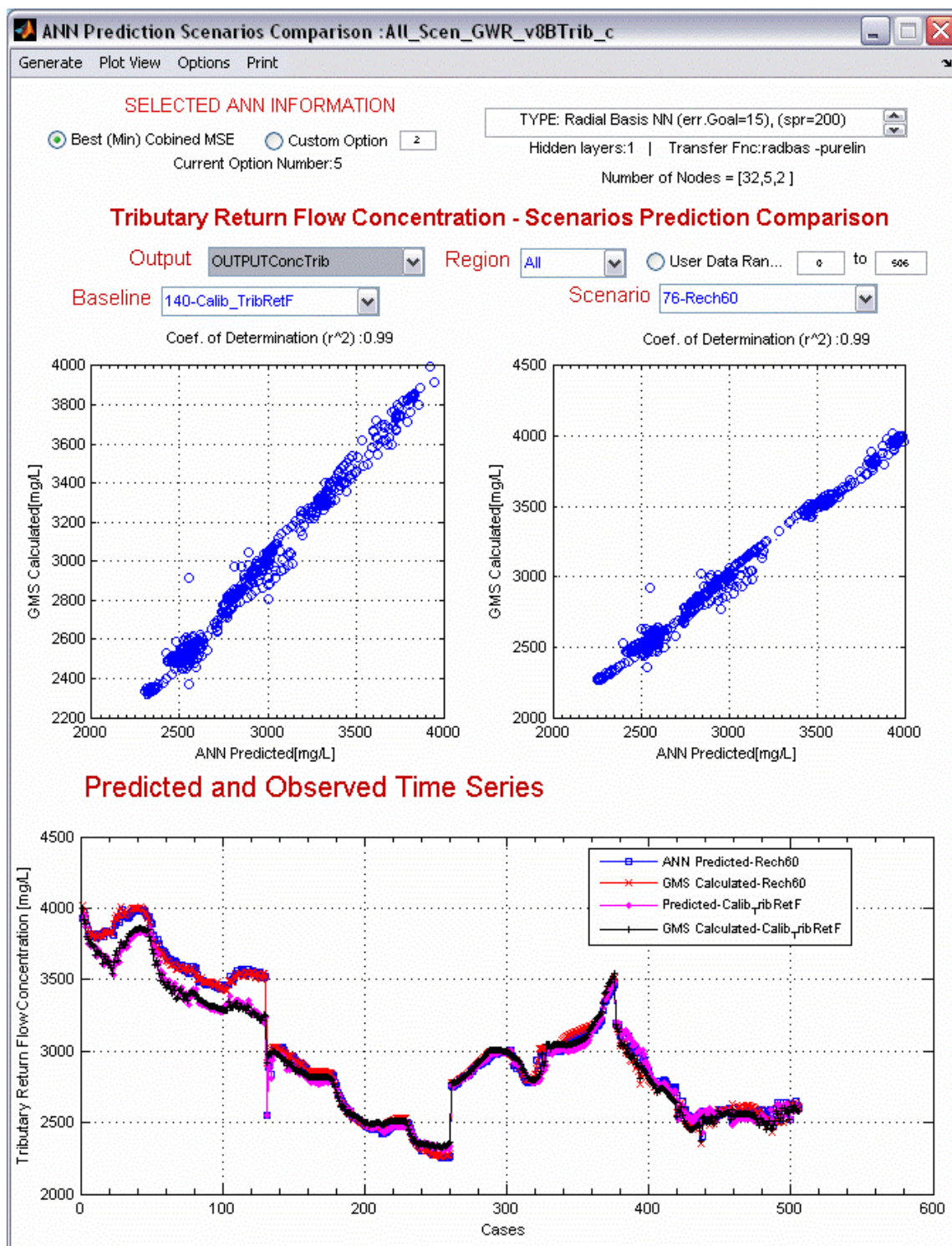




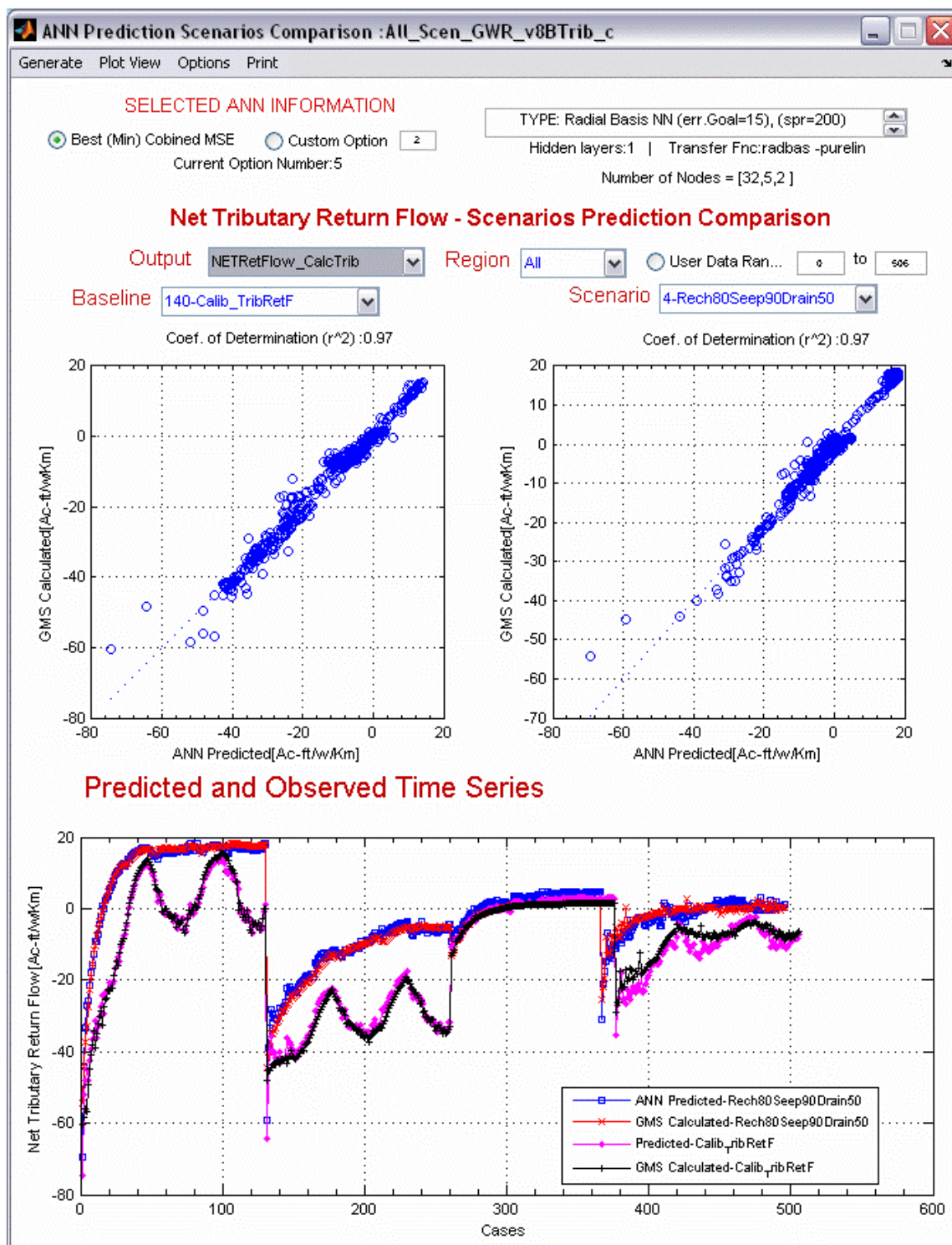
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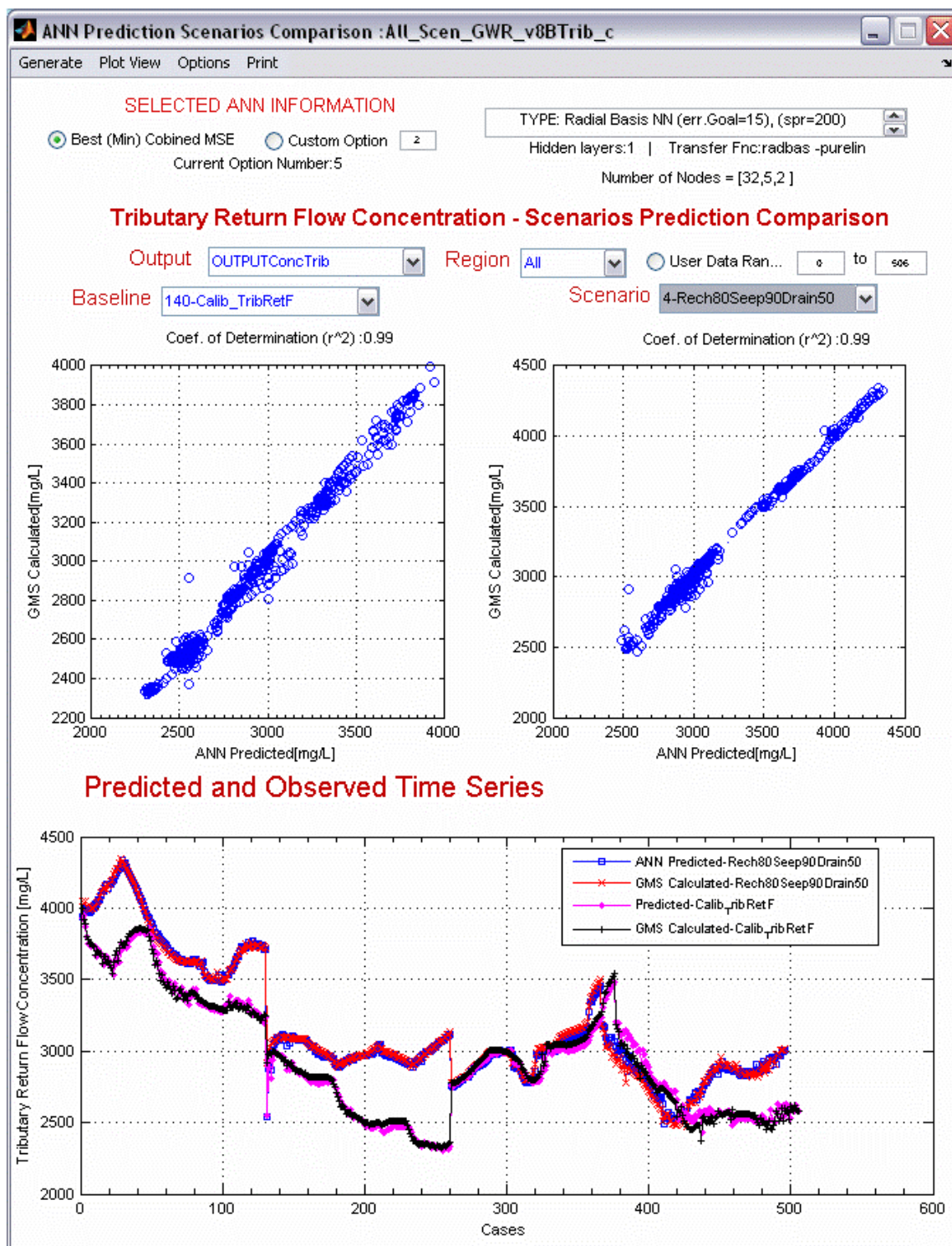


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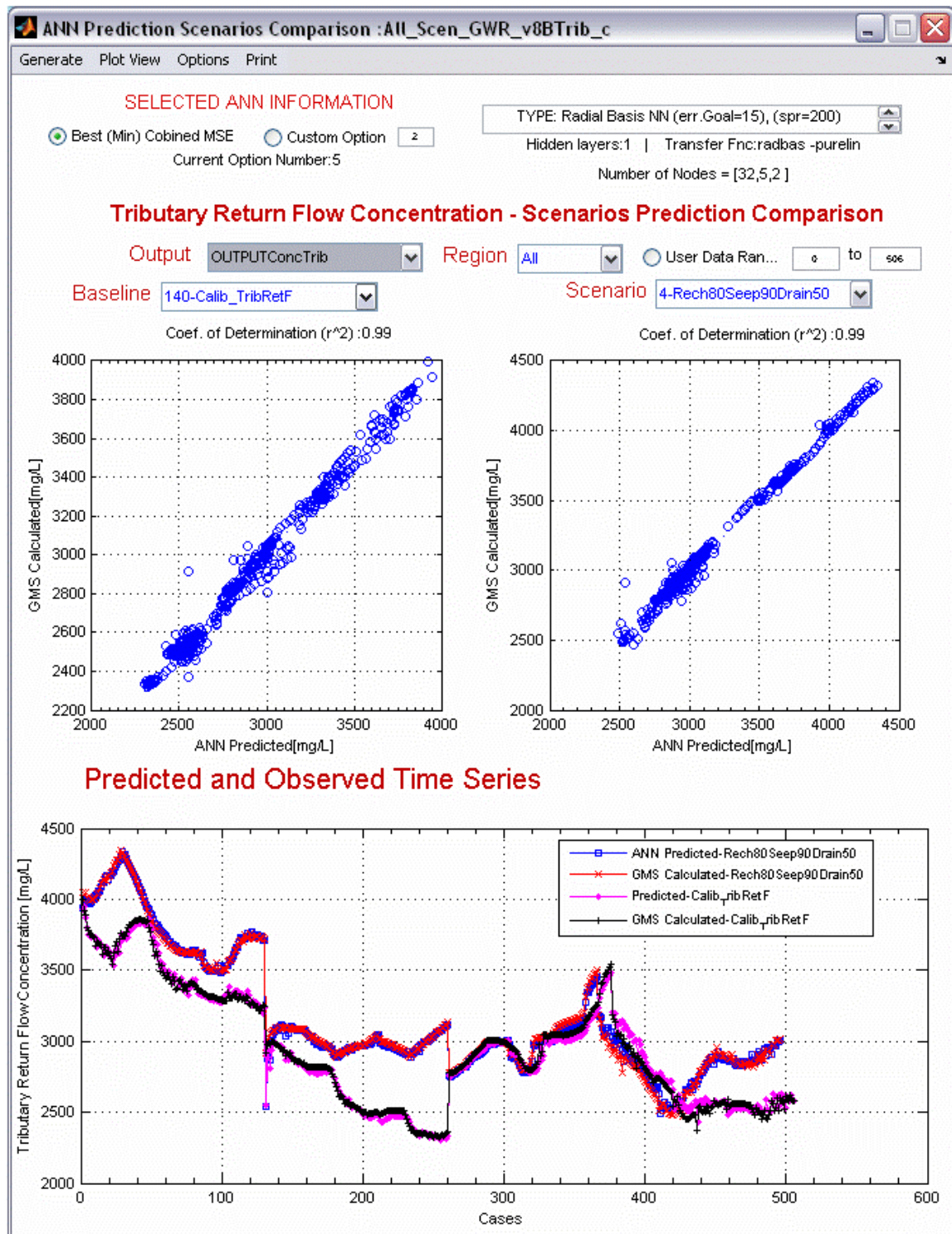




## Tributary – Stream-Aquifer Interaction Modeling

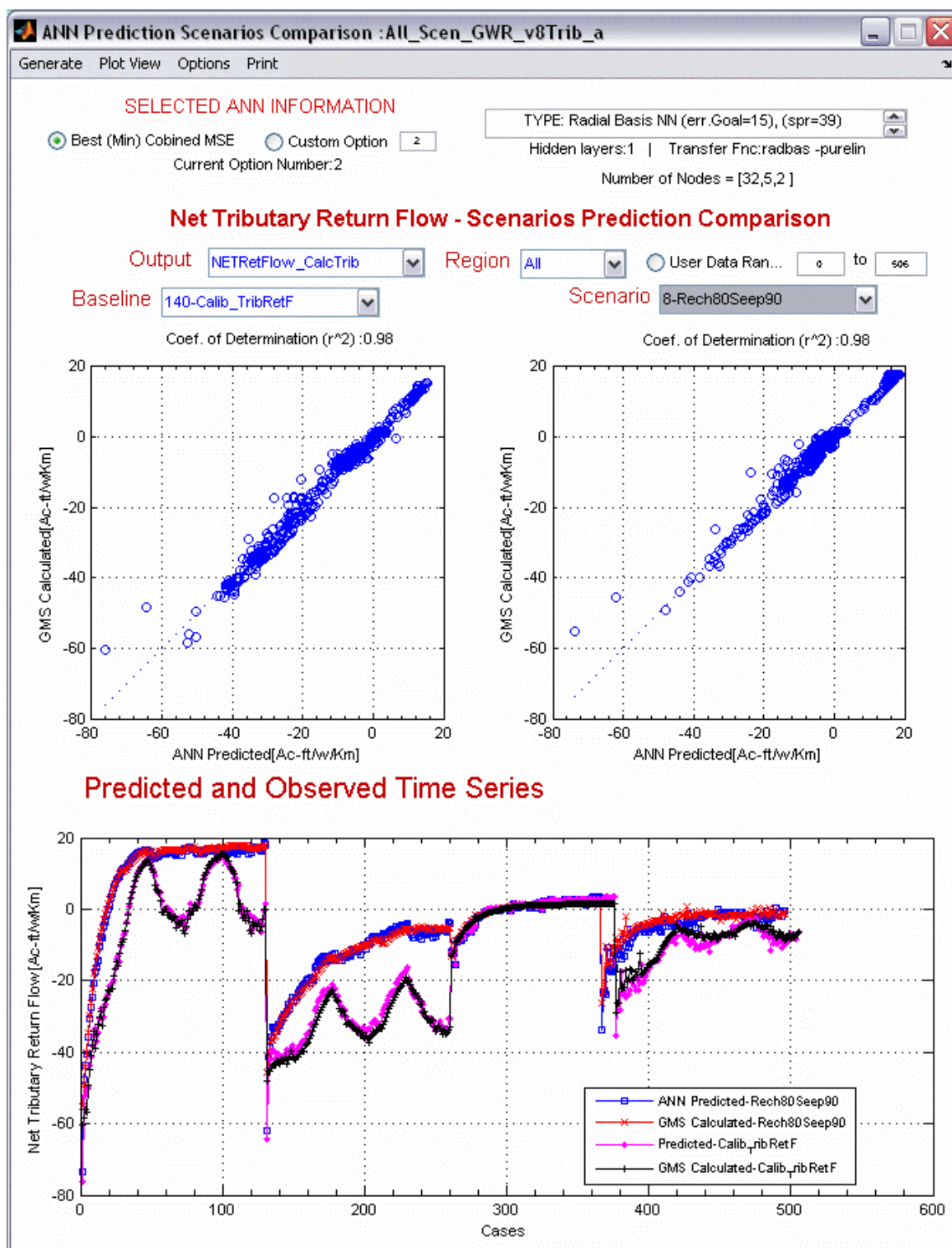


## Tributary – Stream-Aquifer Interaction Modeling



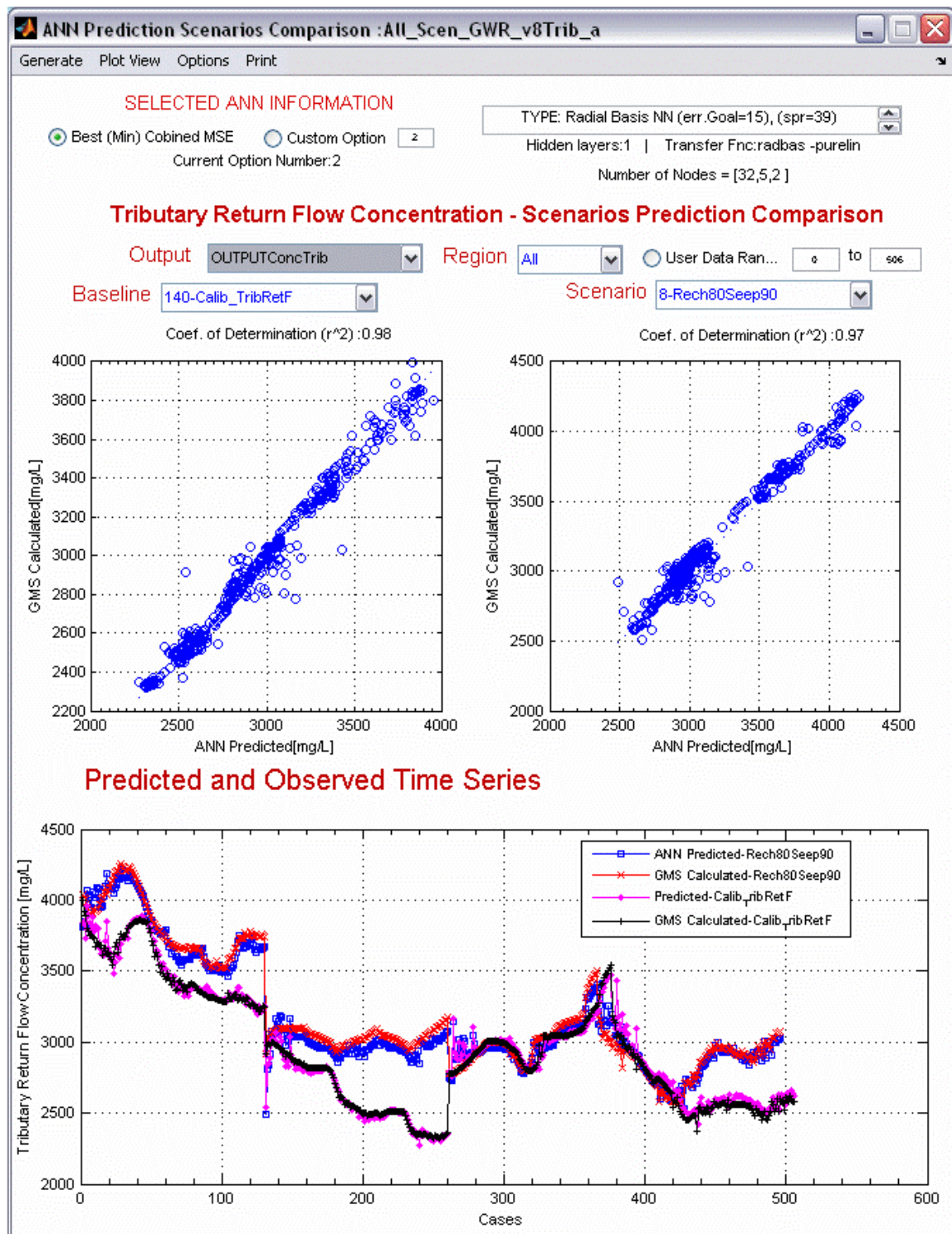
## All\_Scen\_GWR\_v8Trib\_a ANN Baseline and Scenarios Selected Comparisons

## Tributary – Stream-Aquifer Interaction Modeling

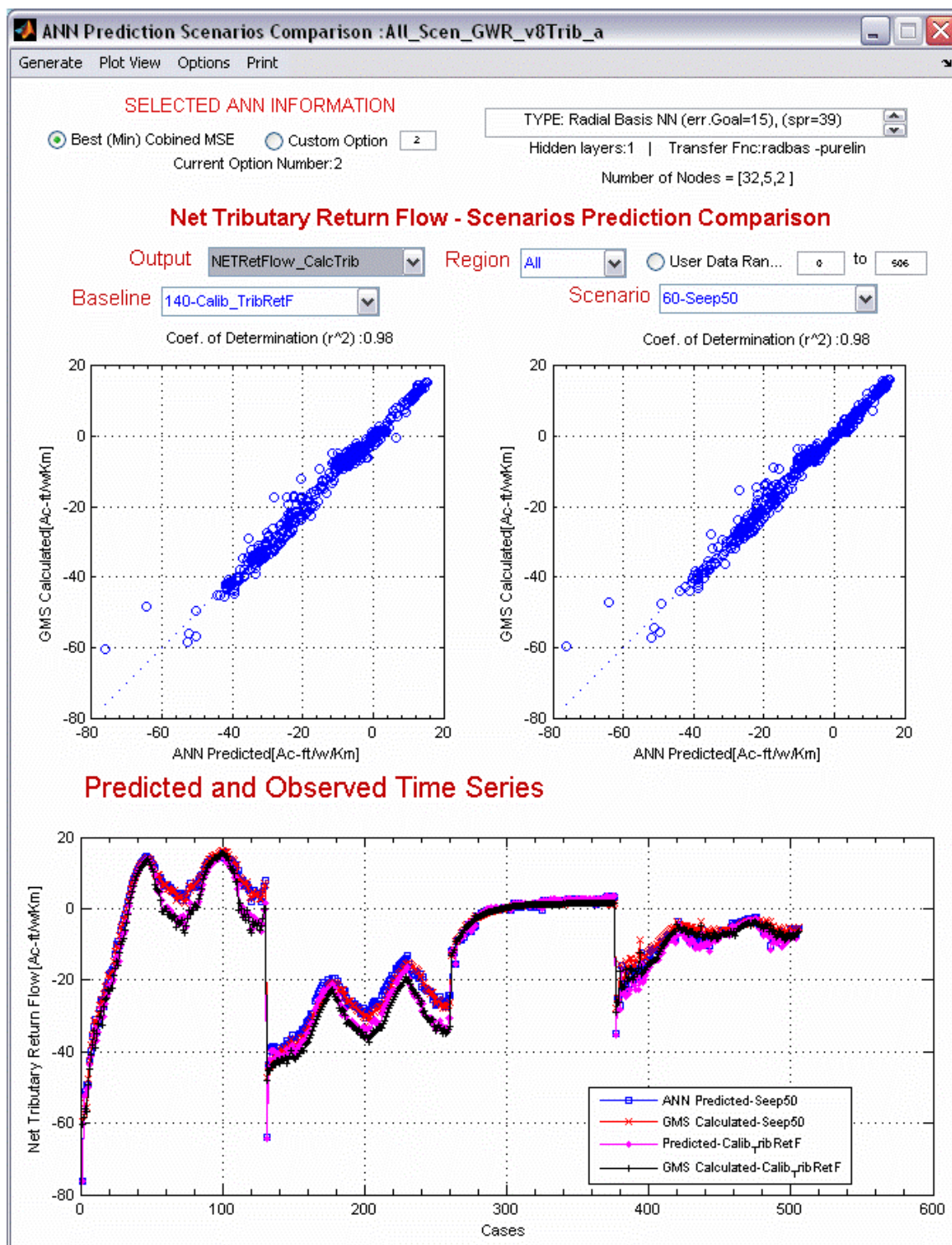




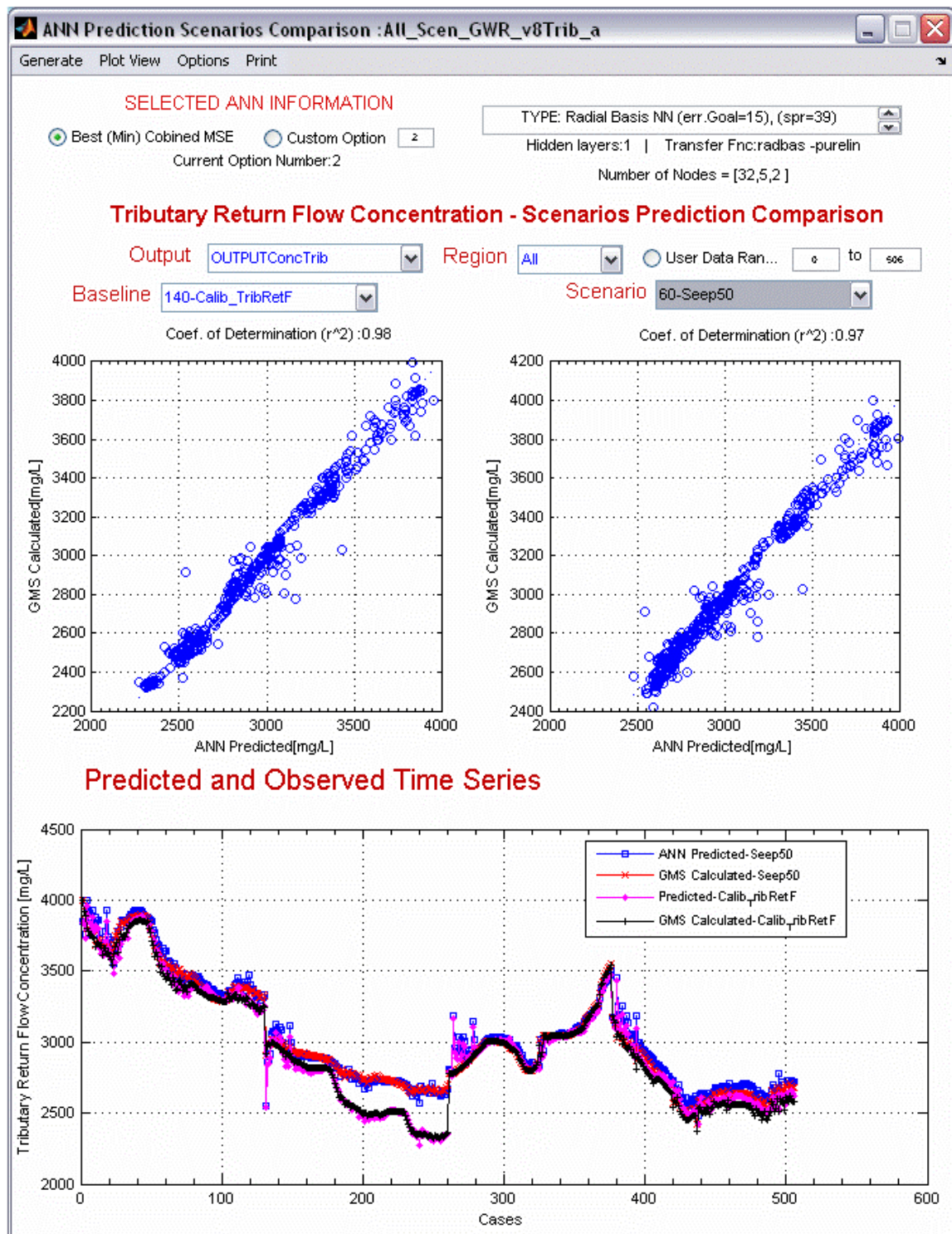
## Tributary – Stream-Aquifer Interaction Modeling



## Tributary – Stream-Aquifer Interaction Modeling

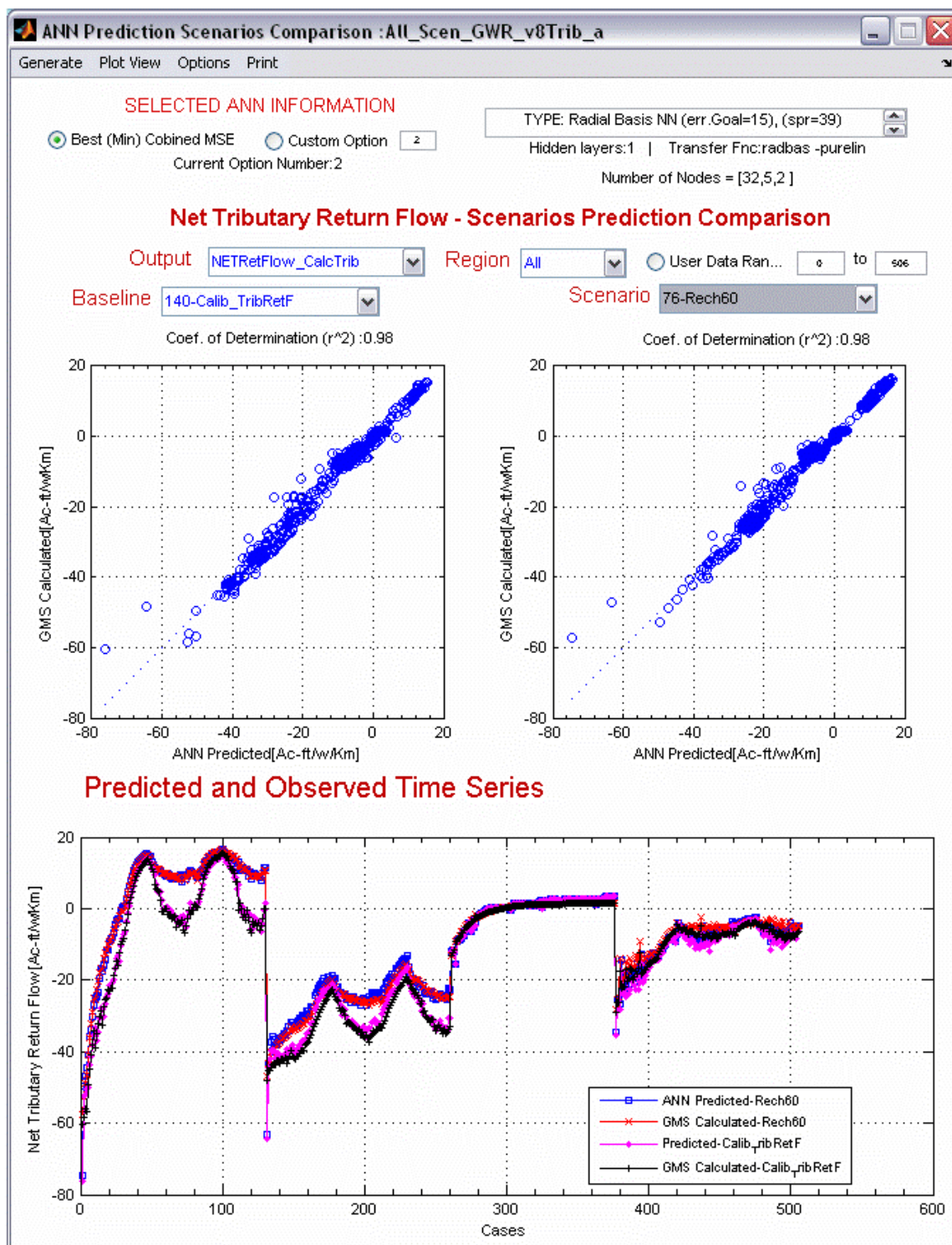


## Tributary – Stream-Aquifer Interaction Modeling

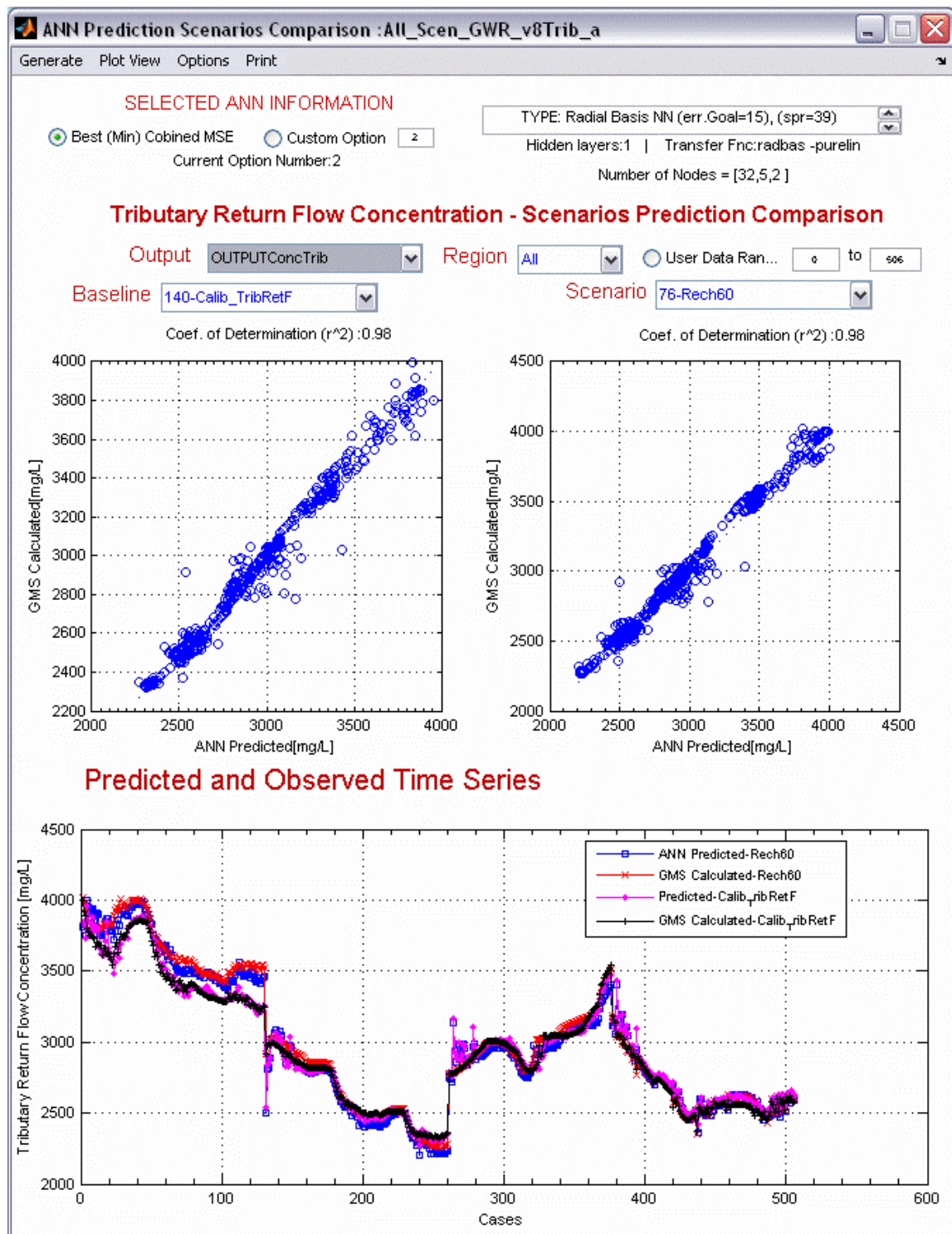




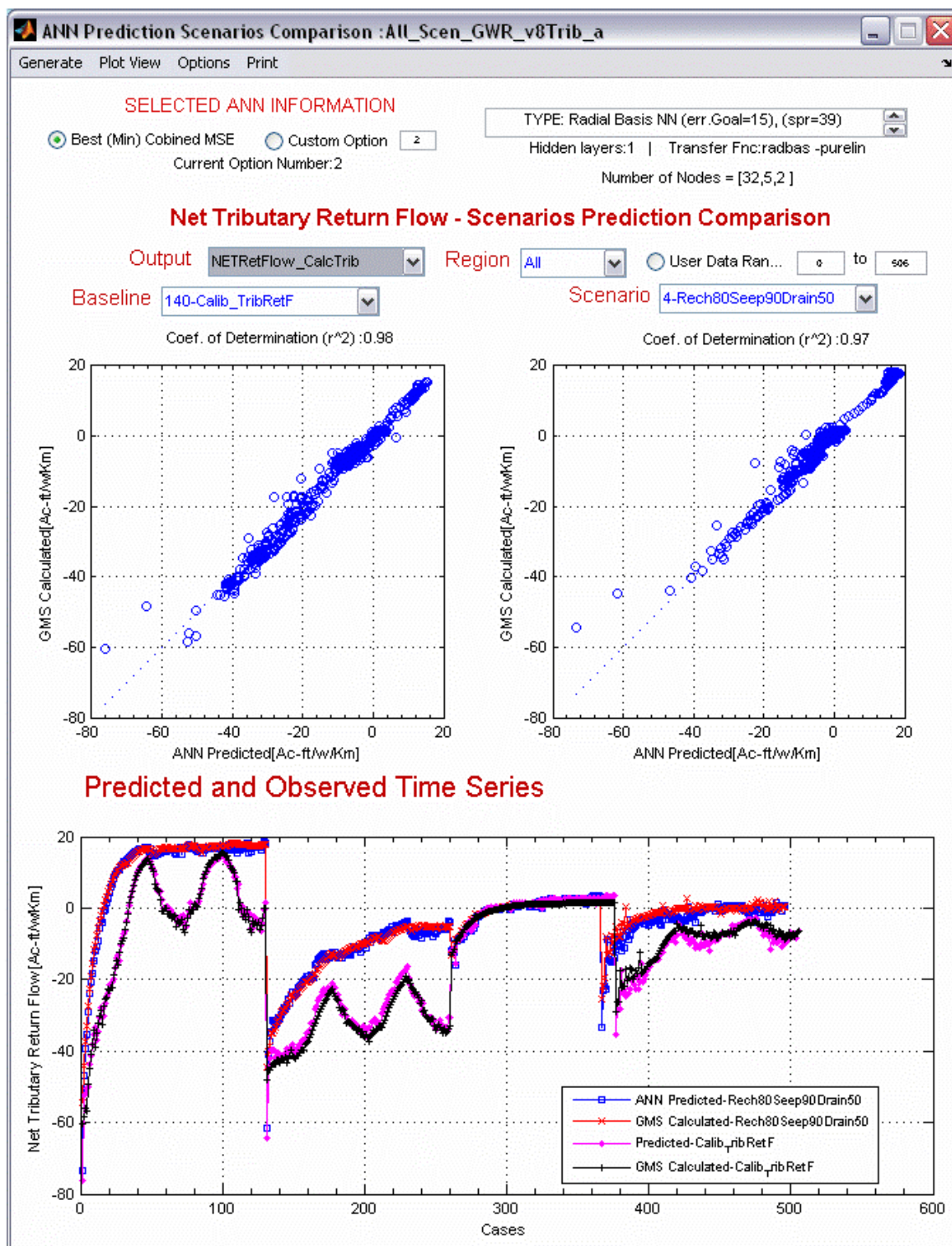
## Tributary – Stream-Aquifer Interaction Modeling



## Tributary – Stream-Aquifer Interaction Modeling



## Tributary – Stream-Aquifer Interaction Modeling





## Tributary – Stream-Aquifer Interaction Modeling

