# APPENDIX G - UPDATES TO RIVERS AND SPRING STAGES

# APPENDIX G
# Summary of updates to rivers and spring stages
# by Tim Desmarais, P.E.

**Introduction**

The following is a description of the cumulative updates made to the MODFLOW River (RIV) and Drain (DRN) package input for the North Florida South East Georgia (NFSEG) groundwater flow model.

The updates are summarized below:

August 2016

After the initial data processing was complete, several additional modifications were made to the dataset:

- Combined multiple RIV / DRN stream or water body segments occurring in the same cell into one MODFLOW element based on the bottom-area weighted average elevation.
    - RIV and DRN stream features were thus 'dissolved' by the model cell separately. This allows for the occurrence of one (but only one) stream-based RIV and one (but only one) stream-based DRN segment in the same cell.
    - RIV and DRN waterbody features were 'dissolved' by the model cell only if the 'LakeName' identifier was the same. For example, a model cell could have 2 waterbody RIV records if they are parts of two differently-named lakes. If the lakes have the same name, or are unnamed, they would be combined into one MODFLOW RIV element.
- Additional stream-based DRN features were added to the stream network and incorporated into the 'dissolve process'. The process would dissolve the new streamlines into existing RIV/DRN records where present, and create new records where previously no RIV/DRN records existed. This made it possible to retain the same dissolved 'Feature ID' identifiers as the previous version.
- Adjusted DRN elevations; increased the DRN elevation if necessary to make sure it is at least one foot above the bottom of Layer 1.
- Incorporated Coastal Wetlands as DRN cells. These consist of wetland features in coastal regions where discharge from the UFA occurs. Portions of these features were 'cut out' to remove overlaps with the other water body layers. Overlaps with the stream layer (RIV and DRN) were 'cut out' using the stream width as a buffer.
- Incorporation of additional stream-based drainage features that were previously absent in the NHD stream layers

<u>December 2016 – January 2017</u>

- (December 2016) Combined multiple RIV / DRN stream or water body segments occurring in the same cell into one MODFLOW element based on the bottom-area weighted average elevation.
    - RIV and DRN stream features were thus 'dissolved' by the model cell separately. This allows for the occurrence of one (but only one) stream-based RIV and one (but only one) stream-based DRN segment in the same cell.
    - RIV and DRN waterbody features were 'dissolved' by the model cell only if the 'LakeName' identifier was the same. For example, a model cell could have 2 waterbody RIV records if they are parts of two differently-named lakes. If the lakes have the same name, or are unnamed, they would be combined into one MODFLOW RIV element.
- (January 2017) A correction was made to the DRN elevations based on the cell bottom elevation for Layer 1. This change increases the DRN elevation if necessary to make sure it is at least one foot above the bottom of Layer 1.
- (January 2017) Incorporation of Coastal Wetlands as DRN cells was completed. Wetland features in coastal regions where discharge from the UFA is believed to occur were identified by Steve Brown (polygon feature class 'coastaldrains_final_01112017'). Portions of these features were 'cut out' to remove overlaps with the other water body layers. Overlaps with the stream layer (RIV and DRN) were 'cut out' using the stream width as a buffer.

<u>March 2017</u>

- Additional stream-based DRN features were added to the stream network and incorporated into the 'dissolve process'. The process would dissolve the new streamlines into existing RIV/DRN records where present, and create new records where previously no RIV/DRN records existed. This made it possible to retain the same dissolved 'Feature ID' identifiers as the previous version.

<u>April 2017</u>

- Similar to the March 2017 update, additional stream-based DRN features were added to the stream network and incorporated into the 'dissolve process'. The new features were dissolved into existing features where possible to maintain the same dissolved 'Feature ID' identifiers as the previous version.

<u>August 2017</u>

- New stream-based DRN features were added. To make the dissolve process more straightforward from a programming perspective, the features were dissolved 'from scratch' and thus changed the FeaureIDs. As an alternative, a new field was added ("ToGage") to indicate the most immediate downstream SW gaging station.