

APPENDIX C

SIMULATED CHANGE IN THE POTENTIOMETRIC SURFACE WITHIN THE CENTRAL SPRINGS/EAST COAST GROUNDWATER FLOW MODEL DOMAINS

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Introduction

Changes in the 2015 (or 2014 for Brevard, Indian River, and Okeechobee counties) potentiometric surface of the Upper Floridan aquifer (UFA) resulting from projected 2040 groundwater withdrawals were simulated using the three groundwater flow models that cover the geographical extent of the Central Springs/East Coast (CSEC) Regional Water Supply Plan (RWSP) area; the 2015 Volusia Model (Volusia model)(Williams 2006), the Northern District Model Version 5 (NDMv5)(HGL et al. 2016), and the East-Central Florida Transient Expanded Model Version 1.0 (ECFTX)(CFWI 2020). Figures depicting the simulated change in UFA levels for the modeled scenarios are provided below along with a brief description of any unique circumstances applicable to each sub-region of the CSEC RWSP area. For all figures, a decrease (drawdown) of the simulated potentiometric surface is indicated by the pink to yellow colors while an increase (rebound) in the simulated potentiometric surface is indicated by the green and blue colors.

Volusia County

Due to complexities associated with simulating the effects of the Tiger Bay Weir with the Volusia model, this project was not included in the modeling scenarios. Instead, the benefit was extracted directly from a local-scale model developed by DHI (2015) to evaluate the effects of the proposed weir, which is discussed in Appendix A of the CSEC RWSP.

- Figure C-1: Changes in the UFA potentiometric surface between 2015 water withdrawals and 2040 projected water demands within the Volusia model domain
- Figure C-2: Same as the scenario represented in Figure C-1 but with water supply and water resource development projects included in the simulation

Marion and North Lake¹ Counties

At the time of plan development, 2040 projected water demand was not available from the Southwest Florida Water Management District (SWFWMD) or the South Florida Water

¹ Within the CSEC RWSP, North Lake County is defined as that portion of Lake County that is not included in the Central Florida Water Initiative.

Management District (SFWMD). Therefore, the following simulations utilized 2040 projected water use for SJRWMD and Suwannee River Water Management District, while SWFWMD and SFWMD withdrawals represented 2035 projections. Drawdown calculations utilized UFA potentiometric surface levels from layer four of the NDMv5.

- Figure C-3: Changes in the UFA potentiometric surface between 2015 estimated water withdrawals and 2040 projected water demands (with SWFWMD and SFWMD held at 2035 projected demand) within the NDMv5 domain
- Figure C-4: Same as the scenario represented in Figure C-3 but with water supply and water resource development projects included in the simulation

Brevard, Indian River, and Okeechobee Counties

For the ECFTX scenario comparison, the 2014 reference condition was used as the baseline to measure drawdown at 2040. As noted in Appendix A of the CSEC RWSP, a modeling scenario with projects was not performed for the Brevard, Indian River, and Okeechobee sub-region since the projected increase in water demand can be met through the implementation of water conservation measures (low estimate) and through the provision of additional available reclaimed water (low estimate). Drawdown calculations utilized UFA potentiometric surface levels from layer three of the ECFTX.

- Figure C-5: Changes in the UFA potentiometric surface between the 2014 reference condition and 2040 projected water demand within the ECFTX domain

References

Central Florida Water Initiative (CFWI). 2020. *Model Documentation Report East-Central Florida Transient Expanded (ECFTX) Model*. Available from:
[https://cfwiwater.com/pdfs/ECFTX Model Final Report Feb 2020.pdf](https://cfwiwater.com/pdfs/ECFTX%20Model%20Final%20Report%20Feb%202020.pdf)

HydroGeoLogic, Inc. (HGL) and Dynamic Solutions, LLC. 2016. *Northern District Groundwater Flow Model Version 5.0*. Prepared for SJRWMD and SWFWMD.

Williams, S.A. 2016. *Simulation of the Effects of Groundwater Withdrawals from the Floridan Aquifer System in Volusia County and Vicinity*. SJRWMD Technical Publication SJ2006-4. Palatka, FL.

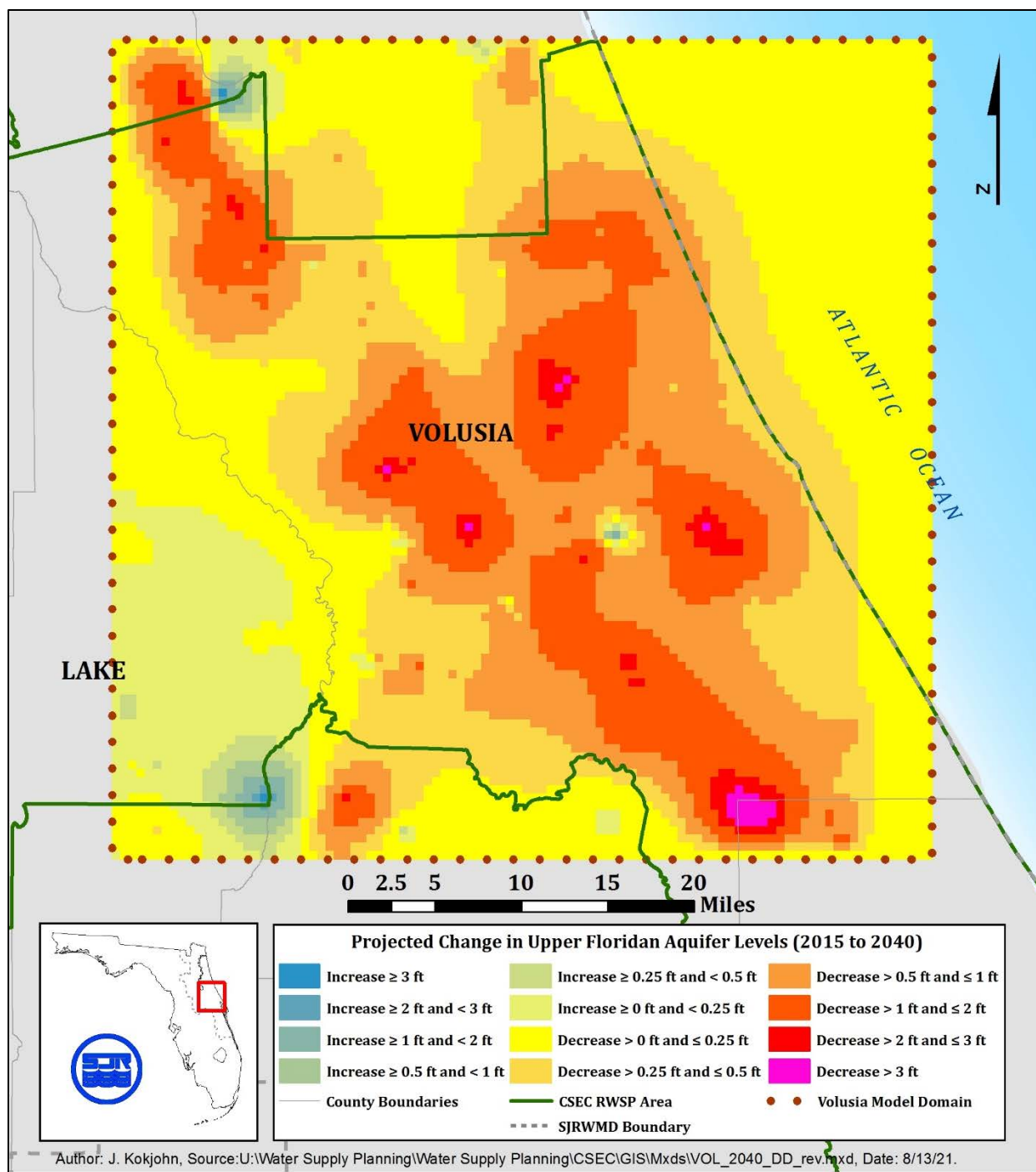


Figure C-1: Predicted Change in Upper Floridan Aquifer Levels from 2015 to 2040 within the Volusia Model Domain

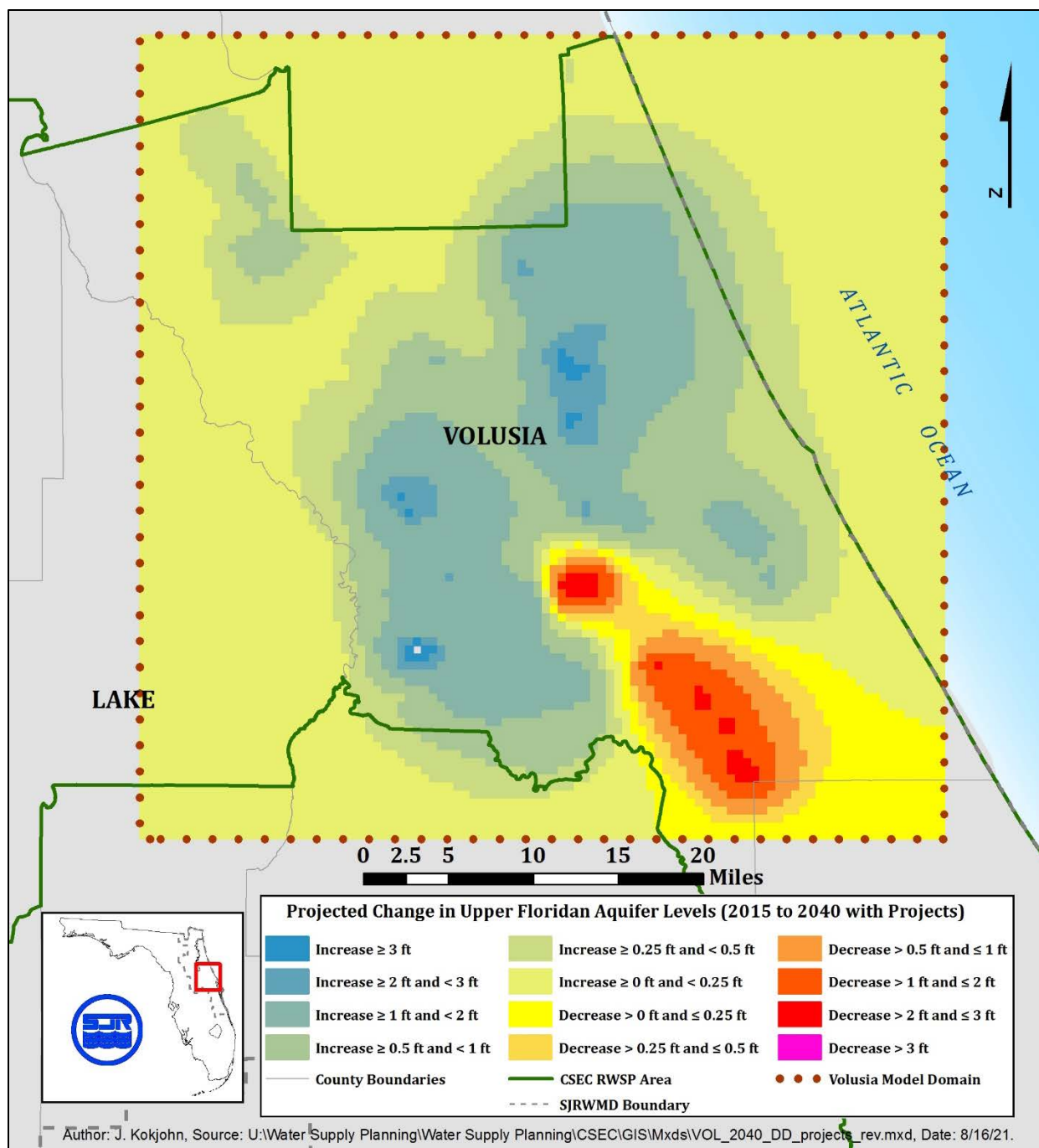


Figure C-2: Predicted Change in Upper Floridan Aquifer Levels from 2015 to 2040 with Water Supply and Water Resource Development Projects Included within the Volusia Model Domain

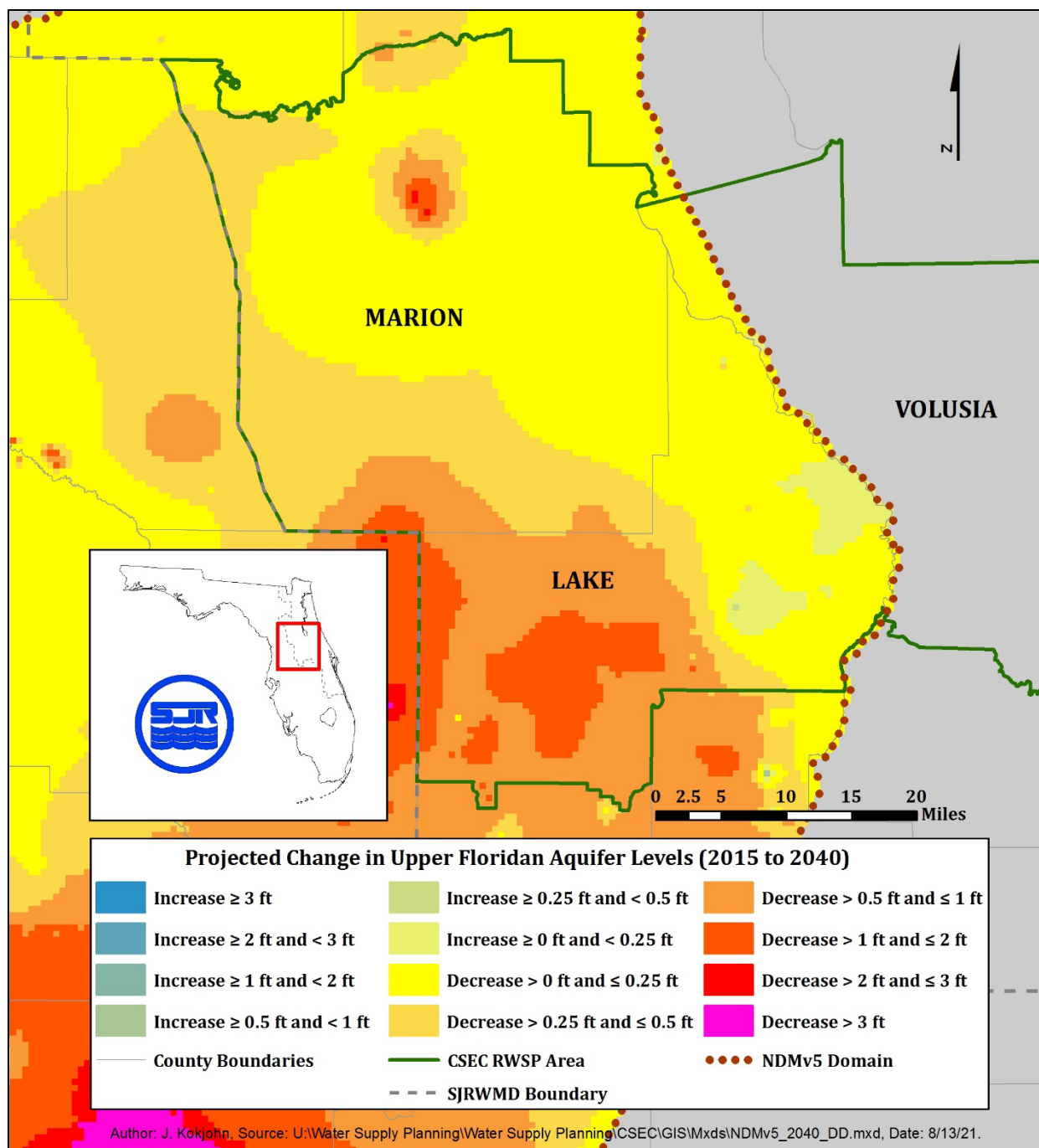


Figure C-3: Predicted Change in Upper Floridan Aquifer Levels from 2015 to 2040 in Marion and North Lake Counties within the NDMv5 Domain

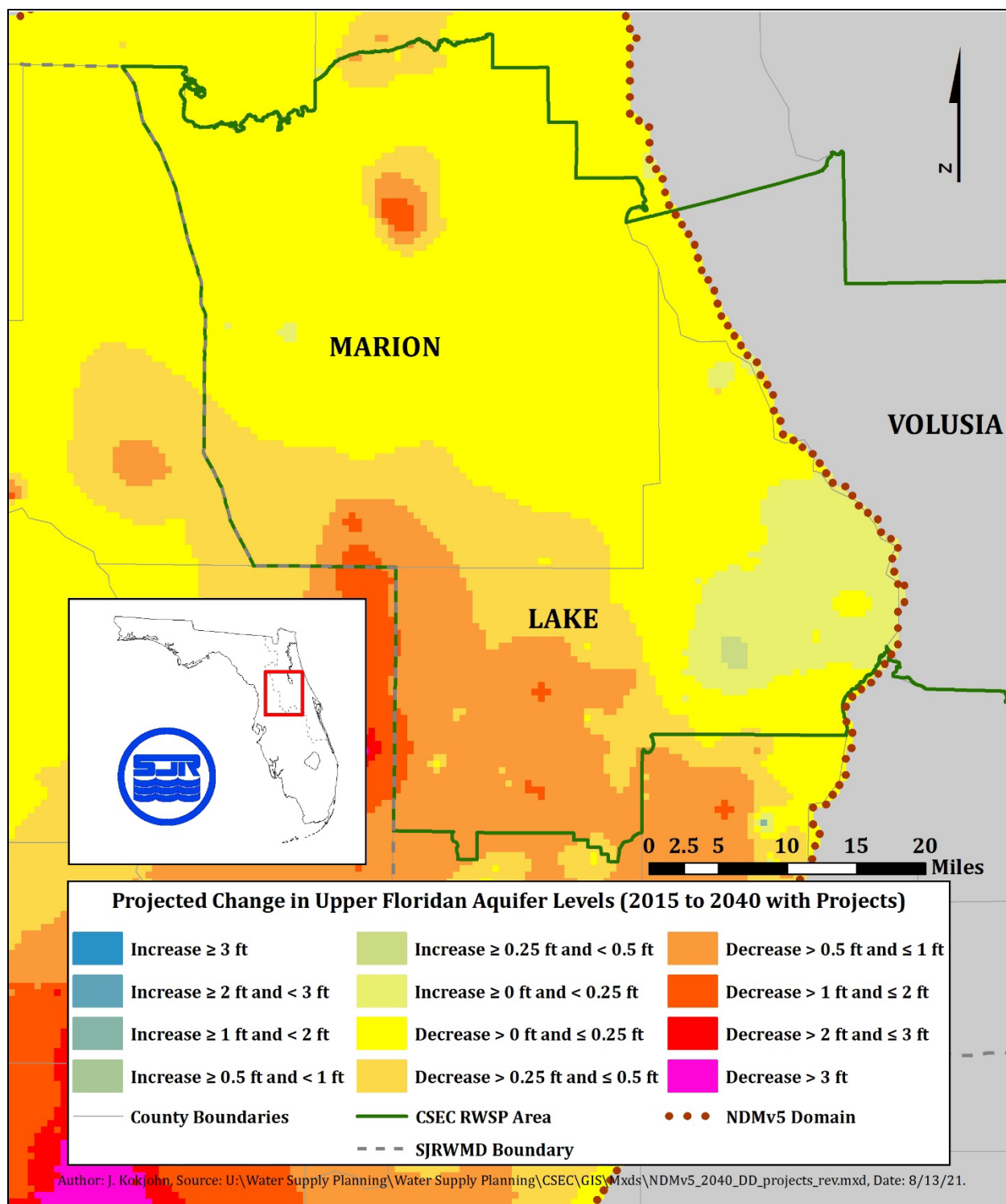


Figure C-4: Predicted Change in Upper Floridan Aquifer Levels from 2015 to 2040 with Water Supply and Water Resource Development Projects Included for Marion and North Lake Counties within the NDMv5 Domain

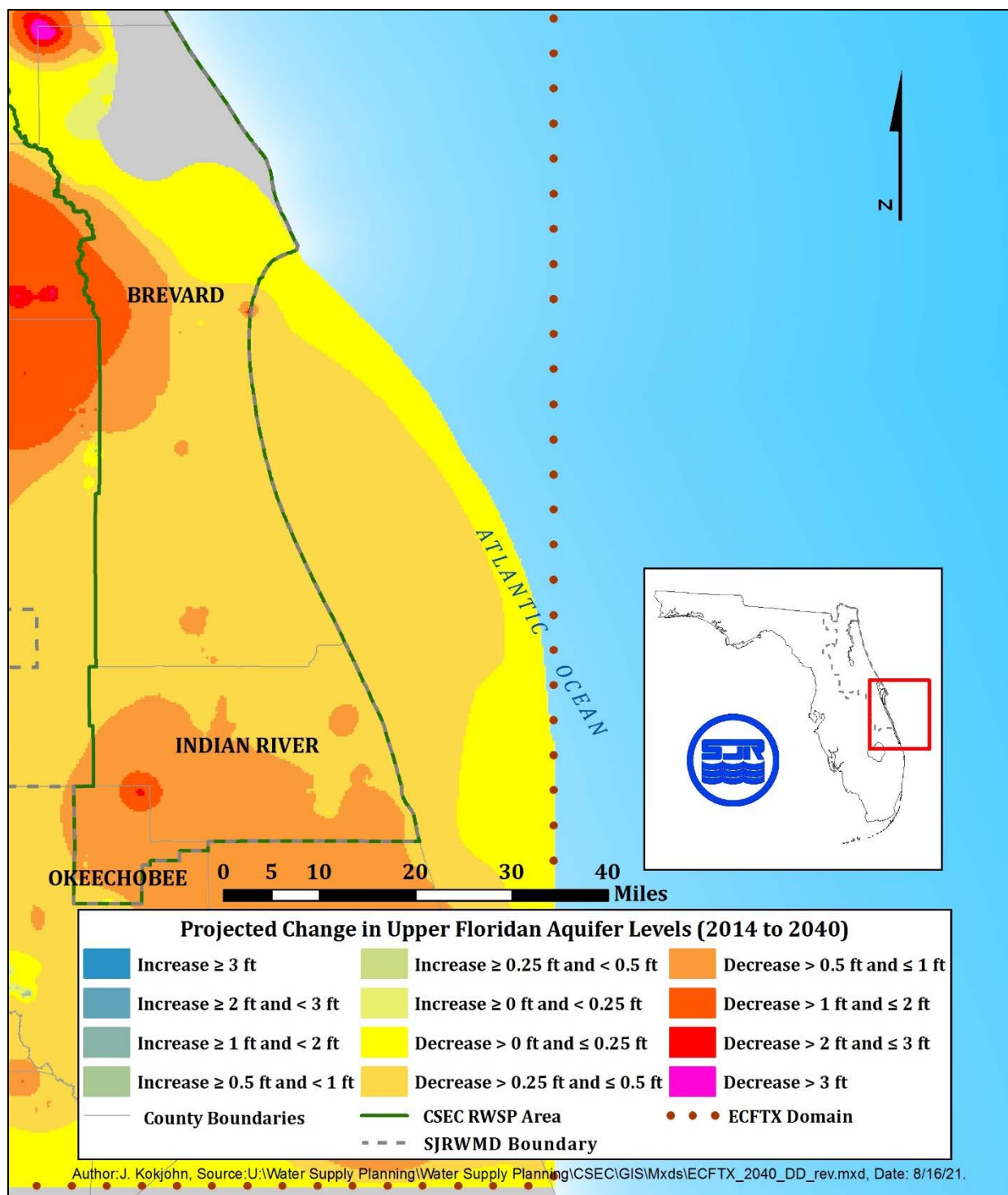


Figure C-5: Predicted Change in Upper Floridan Aquifer Levels from 2014 to 2040 in Brevard, Indian River and Okeechobee Counties within the ECFTX Groundwater Model Domain