The Loxahatchee Refuge 39-Box Stage Model (Version 2.0)

Introduction

* Brief overview of the Loxahatchee Refuge
* Purpose and scope of the 39-Box Stage Model
* History of model development (original Berkeley Madonna version)
* Rationale for porting to R

2. Model Description

* Conceptual framework
  + Compartmental/link-node structure
  + 39 boxes representing different areas of the refuge
* Key model components
  + Water surface elevation simulation
  + Water flow between compartments
  + Inputs (e.g., rainfall, inflows)
  + Outputs (e.g., evapotranspiration, outflows)
* Temporal and spatial scales
* Major assumptions and limitations

3. Model Structure

* Detailed description of the 39 boxes/compartments
* Connectivity between boxes
* Equations governing water movement
* Parameters and variables

4. Data Requirements

* Input data types and sources
* Temporal and spatial resolution of data
* Data preprocessing steps

5. Model Implementation in R

* Overview of R programming language
* Key R packages used
* File structure and organization
* Main functions and their purposes

6. Model Calibration and Validation

* Calibration process and parameters
* Validation datasets and methods
* Performance metrics

7. Running the Model

* System requirements
* Installation instructions
* Step-by-step guide to running simulations
* Input file formats and preparation
* Output file formats and interpretation

8. Sensitivity Analysis and Uncertainty

* Sensitivity analysis methods
* Key parameters for uncertainty analysis
* Interpreting sensitivity and uncertainty results

9. Model Applications

* Example use cases
* Scenario analysis capabilities
* Integration with other models or decision support tools

10. Troubleshooting and FAQs

* Common issues and their solutions
* Frequently asked questions

11. Future Development

* Planned improvements and extensions
* Opportunities for collaboration

12. References

* Literature cited
* Data sources
* Related models and studies

Appendices

A. Glossary of Terms  
B. Complete Model Code  
C. Sample Input/Output Files  
D. Comparison with Berkeley Madonna Version

* Key differences in implementation
* Performance comparison
* Advantages/disadvantages of R version

This outline provides a comprehensive structure for documenting the Loxahatchee Refuge 39-Box Stage Model, covering its theoretical basis, practical implementation, and usage instructions. It also addresses the transition from Berkeley Madonna to R, which will be helpful for users familiar with the original version

[1](https://berkeley-madonna.myshopify.com/pages/features" \t "_blank)

[3](https://en.wikipedia.org/wiki/Berkeley_Madonna" \t "_blank)

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