



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



HANAA ALY



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شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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ASSESSING ATMOSPHERIC AND HYDROLOGICAL CONDITIONS IN THE EASTERN NILE BASIN THROUGH A COUPLED ATMOSPHERIC HYDROLOGICAL MODEL APPROACH

By

Mohamed Sherif Abo Elfotoh Abd Elwares

A Thesis Submitted to
the Faculty of Engineering at Cairo University
In Partial Fulfillment of the
Requirements for the Degree of
DOCTOR OF PHILOSOPHY

In
IRRIGATION AND HYDRAULICS ENGINEERING

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Title of Thesis:

Assessing Atmospheric and Hydrological Conditions in the Eastern Nile Basin through a Coupled Atmospheric Hydrological Model Approach

Key Words:

WRF; WRF-Hydro; Eastern Nile Basin; Atmospheric and Terrestrial Water Balance; gridded global precipitation and temperature datasets

Summary:

Assessing the atmospheric and hydrological conditions in addition to water balance calculations in any area can pave the way to understand both atmospheric and hydrological systems and the interactions between them, in order to predict the effect of future climate change on the water resources within any region.

Global gridded available datasets for some meteorological variables as temperature and precipitation represent very useful alternatives to ground observations. In this study we assess the performance of different gridded datasets for precipitation and temperature over the Eastern Nile Basin region, to be used later in validating atmospheric models and for driving or validating hydrological models of this area.

Atmospheric and terrestrial water balance take place during the second part of the study using the outputs from WRF model. During the last part coupling between WRF and WRF-Hydro take place to simulate the eastern Nile Basin river flow, and a recommended configuration was found.

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

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Table of Content

DISCLAIMER	I
ACKNOWLEDGMENTS	II
TABLE OF CONTENT.....	III
LIST OF TABLES	VI
LIST OF FIGURES.....	VIII
ABSTRACT	XII
CHAPTER ONE: INTRODUCTION	1
1.1. PREAMBLE	1
1.2. PROBLEM DEFINITION	2
1.3. RESEARCH OBJECTIVES	3
1.4. THESIS OUTLINE	3
CHAPTER TWO: LITERATURE REVIEW.....	5
2.1. INTRODUCTION	5
2.2. THE WRF MODELING SYSTEM.....	5
2.2.1. WRF FORECASTING VARIABLES	6
2.2.2. WRF GOVERNING EQUATIONS.....	7
2.2.3. PHYSICS PARAMETERIZATION AND INTERACTION	7
2.3. THE WRF-HYDRO MODELING SYSTEM	9
2.3.1. WRF-HYDRO FORECASTING VARIABLES	11
2.3.2. VERTICAL LAND SURFACE MODEL	11
2.3.3. SUBSURFACE FLOW ROUTING MODULE.....	12
2.3.4. OVERLAND FLOW ROUTING MODULE	14
2.3.5. OVERLAND FLOW ROUTING MODULE	15
2.3.6. CONCEPTUAL BASE FLOW MODULE	15
2.3.7. SIMPLE WATER MANAGEMENT MODULE	16
2.4. INITIAL AND BOUNDARY CONDITIONS	16
2.5. METEOROLOGICAL GRIDDED DATASETS.....	16
2.5.1. TROPICAL RAINFALL MEASURING MISSION (TRMM)	17
2.5.2. GLOBAL PRECIPITATION CLIMATOLOGY CENTER (GPCC)	17
2.5.3. CLIMATE RESEARCH UNIT (CRU)	17
2.5.4. UNIVERSITY OF DELAWARE (UDEL)	17
2.5.5. GLOBAL HISTORICAL CLIMATOLOGY NETWORK (GHCN).....	18
2.6. PREVIOUS STUDIES	18

2.6.1. GRIDDED DATASETS FOR PRECIPITATION AND TEMPERATURE	18
2.6.2. WATER BALANCE CALCULATIONS	18
2.6.3. COUPLING ATMOSPHERIC AND HYDROLOGICAL MODELS	19
CHAPTER THREE: METHODOLOGY	23
3.1. INTRODUCTION	23
3.2. METHODOLOGY OVERVIEW.....	23
3.2.1. GRIDDED DATASETS FOR PRECIPITATION AND TEMPERATURE	23
3.2.2. WATER BALANCE CALCULATIONS	24
3.2.3. COUPLING ATMOSPHERIC AND HYDROLOGICAL MODELS	26
3.3. STUDY AREA	26
3.4. MODELS AND NUMERICAL SIMULATION DOMAIN	29
3.5. EVALUATION TECHNIQUE	31
3.6. DATASETS	33
3.6.1. GRIDDED DATASETS FOR PRECIPITATION AND TEMPERATURE	33
3.6.2. INITIAL AND BOUNDARY CONDITIONS.....	34
3.6.3. TERRESTRIAL DATA	35
3.6.4. OBSERVATION DATA SETS.....	37
3.7. EXPERIMENTAL SETUP	47
3.7.1. GRIDDED DATASETS FOR PRECIPITATION AND TEMPERATURE	47
3.7.2. WATER BALANCE CALCULATIONS	47
3.7.3. COUPLING WRF AND WRF-HYDRO	49
3.8. COMPUTATIONAL REQUIREMENTS	51
CHAPTER FOUR: RESULTS OF EVALUATING AND ASSESSING GRIDDED DATASETS FOR PRECIPITATION AND TEMPERATURE	52
4.1. INTRODUCTIONS.....	52
4.2. PRECIPITATION	52
4.3. SURFACE AIR TEMPERATURE	67
4.4. RECOMMENDED DATASETS	76
CHAPTER FIVE: RESULTS OF WRF SIMULATION AND WATER BALANCE CALCULATIONS	78
5.1. INTRODUCTION	78
5.2. WRF SIMULATION.....	78
5.2.1. PRECIPITATION.....	78
5.2.2. SURFACE AIR TEMPERATURE	81
5.2.3. ACTUAL EVAPOTRANSPIRATION.....	86
5.2.4. SURFACE RUNOFF.....	86
5.3. WATER BALANCE CALCULATIONS.....	91

5.3.1. TERRESTRIAL WATER BALANCE	91
5.3.2. ATMOSPHERIC WATER BALANCE	94
5.4. WRF PERFORMANCE AND COUPLING TECHNIQUE	98
CHAPTER SIX: RESULTS OF COUPLING WRF AND WRF-HYDRO MODELS	99
6.1. INTRODUCTION	99
6.2. WRF-HYDRO CALIBRATION AND PERFORMANCE	99
CHAPTER 7 CHAPTER SEVEN: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS.	114
7.1. SUMMARY	114
7.2. CONCLUSIONS	116
7.3. RECOMMENDATIONS	116
REFERENCES	118

List of Tables

TABLE (2-1): SOME OF THE WRF FORECASTING VARIABLES	6
TABLE (2-2): VARIABLES PROVIDE DIFFERENT PARAMETERIZATION CATEGORIES.....	8
TABLE (2-3): METEOROLOGICAL VARIABLES REQUIRED TO DRIVE WRF-HYDRO	9
TABLE (2-4): SOME OF THE WRF-HYDRO FORECASTING VARIABLES.....	11
TABLE (3-1): EXTENT AND HORIZONTAL SPATIAL RESOLUTION OF THE EASTERN NILE BASIN DOMAIN	29
TABLE (3-2): PARAMETERS USED FROM ERA-INTERIM FOR INITIAL AND BOUNDARY CONDITIONS FOR WRF SIMULATION	34
TABLE (3-3): MODIFIED IGBP-MODIS LAND USE CATEGORIES.....	35
TABLE (3-4): GHCN STATIONS USED TO ASSESS PRECIPITATION OVER THE ENB.....	37
TABLE (3-5): GHCN STATIONS USED TO ASSESS SURFACE AIR TEMPERATURE OVER ENB.....	38
TABLE (3-6): RIVER FLOW STATIONS USED	40
TABLE (3-7): RIVER FLOW DATA AT THE DIFFERENT STATIONS.....	42
TABLE (3-7): RIVER FLOW DATA AT THE DIFFERENT STATIONS (CONT.)..	43
TABLE (3-7): RIVER FLOW DATA AT THE DIFFERENT STATIONS (CONT.)..	44
TABLE (3-7): RIVER FLOW DATA AT THE DIFFERENT STATIONS (CONT.)..	45
TABLE (3-7): RIVER FLOW DATA AT THE DIFFERENT STATIONS (CONT.)..	46
TABLE (3-8): PHYSICS PARAMETERIZATION SCHEMES FOR WRF SIMULATION.....	48
TABLE (3-9): DEFAULT VALUE FOR CHANNEL MANNING ROUGHNESS COEFFICIENT FOR DIFFERENT STREAM ORDER IN THE WRF-HYDRO MODEL	50
TABLE (4-1): STATISTICAL METRIC VALUES FOR EACH GRIDDED DATASET OF PRECIPITATION AT EACH STATION	66
TABLE (4-2): QUANTILES VALUE OF THE MONTHLY SURFACE AIR TEMPERATURE DIFFERENCE BETWEEN CRU AND UDEL.....	67
TABLE (4-3): STATISTICAL METRIC VALUES FOR EACH GRIDDED DATASET OF SURFACE AIR TEMPERATURE AT EACH STATION	76
TABLE (4-4): TOTAL SCORE FOR EACH DATASET IN THE SUBJECTIVE CRITERIA USED.....	77
TABLE (5-1): AVERAGE CHANGE IN TERRESTRIAL WATER STORAGE FOR EACH MONTH	95
TABLE (6-1): CALIBRATION RESULTS FOR CHANNEL MANNING ROUGHNESS COEFFICIENT (MANN)	100
TABLE (6-2): CALIBRATION RESULTS FOR THE SURFACE RUNOFF PARAMETER (REFKDT)	100

TABLE (6-3): CALIBRATION RESULTS FOR THE OVERLAND FLOW ROUGHNESS SCALING FACTOR (OVROUGHRT).....	101
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List of Figures

FIGURE (2-1): WRF MODELING SYSTEM FLOW CHART	6
FIGURE (2-2): INTERACTIONS BETWEEN PHYSICS PARAMETERIZATIONS ..	8
FIGURE (2-3): WRF-HYDRO MODELING SYSTEM FLOW CHART	10
FIGURE (3-1): STUDY METHODOLOGY	24
FIGURE (3-2): THE EASTERN NILE BASIN.....	28
FIGURE (3-3): MENA-CORDEX DOMAIN EXTENT AND LAND SEA MASK, AND THE EXTENT OF THE ENB DOMAIN RELATIVE TO THE PARENT ONE, ORANGE FOR LAND AND BLUE FOR WATER	29
FIGURE (3-4): EASTERN NILE BASIN DOMAIN EXTENT AND LAND SEA MASK, ORANGE FOR LAND AND BLUE FOR WATER.....	30
FIGURE (3-5): DEM USED FOR ENB DOMAIN DELINEATION	36
FIGURE (3-6): LOCATION OF GHCN STATIONS USED FOR PRECIPITATION ASSESSMENT, FOCUSING ON THE ETHIOPIAN HIGHLANDS	38
FIGURE (3-7): LOCATION OF GHCN STATIONS USED FOR SURFACE AIR TEMPERATURE ASSESSMENT	39
FIGURE (3-8): LOCATION OF RIVER FLOW MEASURING STATIONS.....	41
FIGURE (3-9): RELATION BETWEEN HEAT OF VAPORIZATION AND TEMPERATURE FOR WATER.....	49
FIGURE (3-10): CY-TERA HPC FACILITY	51
FIGURE (4-1): AVERAGE DAILY PRECIPITATION BY MONTH (MM/DAY) DURING THE STUDY PERIOD FOR TRMM OVER THE ENB, TOP-LEFT PANEL IS FOR JANUARY AND THE BOTTOM-RIGHT PANEL IS FOR DECEMBER.....	53
FIGURE (4-2): AVERAGE DAILY PRECIPITATION BY MONTH (MM/DAY) DURING THE STUDY PERIOD FOR GPCC OVER THE ENB, TOP-LEFT PANEL IS FOR JANUARY AND THE BOTTOM-RIGHT PANEL IS FOR DECEMBER	54
FIGURE (4-3): AVERAGE DAILY PRECIPITATION BY MONTH (MM/DAY) DURING THE STUDY PERIOD FOR CRU OVER THE ENB, TOP-LEFT PANEL IS FOR JANUARY AND THE BOTTOM-RIGHT PANEL IS FOR DECEMBER	55
FIGURE (4-4): BIAS (TRMM – CRU) FOR AVERAGE DAILY PRECIPITATION (MM/DAY) DURING THE RAINY SEASON MONTHS OVER THE ENB, FROM LEFT JUNE, JULY, AUGUST AND SEPTEMBER	56
FIGURE (4-5): BIAS (GPCC – CRU) FOR AVERAGE DAILY PRECIPITATION (MM/DAY) DURING THE RAINY SEASON MONTHS OVER THE ENB, FROM LEFT JUNE, JULY, AUGUST AND SEPTEMBER	57
FIGURE (4-6): MONTHLY TIME SERIES FOR THE AVERAGE PRECIPITATION OVER THE ETHIOPIAN HIGHLANDS FOR THE THREE DATASETS DURING THE STUDY PERIOD (A), BOXPLOT FOR THE THREE DATASETS	