بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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ASSESSMENT OF FLOW PATTERNS AND MORPHOLOGICAL CHANGES IN NILE RIVER BENDS, CASE STUDY: DAMIETTA BRANCH

By

Ashraf Farag Abdallah Boghdady

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE
in
Irrigation and Hydraulics Engineering

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
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Title of Thesis:

Assessment of Flow Patterns and Morphological Changes in Nile River Bends, Case Study: Damietta Branch

Key Words:
River bends; River bed morphology; Secondary flow; Bend scour equation; ADCP.

Summary:

The river's bends are a major feature of rivers as a result of their hydraulic and morphological characteristics where the flow pattern has a three-dimensional (3D) nature. The aim of this research is to study the flow pattern-induced morphological changes in river bends and evaluation of secondary currents in the different scenarios of flow. Twenty bends in the Damietta branch (Nile River) in Egypt were selected where the study was done by conducting a bathymetric survey and 3D velocity measurements by an ADCP. A numerical model (Delft 3D) was applied to simulate the study reach. Also, a Geographic information system (GIS) was used to analyze the morphological changes and bend scour depths. Four equations were selected for predicting bend scour depths and the results showed that these equations are not reliable in the study reach. Therefore, a new equation was derived to applied in the Nile River.

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.

Name: Ashraf Farag Abdallah Boghdady Date: / / 2021

Signature:

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