

This thesis is
lovingly
dedicated to my
son

REYANSH

DECLARATION

I hereby declare that the thesis entitled “**Role of Soil Properties on Ecosystem Carbon Flux in a semi-evergreen Forest of North East India**” being submitted to the Department of Environmental Science, School of Sciences, Tezpur University in partial fulfillment for the award of the degree of Doctor of Philosophy is a record of original research work carried out by me under the supervision of **Dr. Nirmali Gogoi**, Department of Environmental Science, Tezpur University.

I also declare that neither this work as a whole nor a part of it has been submitted to any other university or institute for award of any other degree or diploma.

All helps received during thesis writing from various sources have been duly acknowledged.

Place: Tezpur, Assam

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CERTIFICATE OF THE SUPERVISOR

This is to certify that the thesis entitled “**Role of Soil Properties on Ecosystem Carbon Flux in a semi-evergreen Forest of North East India**” submitted to the School of Sciences, Tezpur University in partial fulfillment for the award of the degree of Doctor of Philosophy in Environmental Science is a record of research work carried out by **Ms. Palakshi Borah** under my supervision and guidance.

All help received by her from various sources have been duly acknowledged.

No part of this thesis has been submitted elsewhere for award of any other degree.

Place: Tezpur, Assam

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LIST OF ABBREVIATIONS

Abbreviations	Full forms
ANN	Artificial neural network
ANOVA	Analysis of variance
BOD	Biological oxygen demand
CCE	Calcium carbonate equivalent
CEC	Cation exchange capacity
C/N ratio	Carbon-nitrogen ratio
DNA	Deoxyribonucleic Acid
DOC	Dissolved organic carbon
DTGA	Differential thermogravimetric analysis
EC	Electrical conductivity
EVI	Enhanced vegetation index
FAS	Ferrous ammonium sulphate
FESEM	Field emission scanning electron microscopy
FT-IR	Fourier transform infra-red
GEP	Gross ecosystem production
GHG	Greenhouse gases
GPP	Gross primary production
IPCC	Intergovernmental Panel on Climate Change
KNP	Kaziranga National Park
K	Potassium
MAP	Mean annual precipitation
MAT	Mean annual temperature
MBC	Microbial biomass carbon
MUB	Modified universal buffer
N	Nitrogen
NDVI	Normalised difference vegetation index
NE	Northeast
NEE	Net ecosystem exchange
NEP	Net ecosystem productivity
NPP	Net primary production

OTU	Operational taxonomic unit
P	Phosphorus
PCR-DGGE	Polymerase chain reaction-denaturing gradient gel electrophoresis
PNP	Para nitro phenyl
POC	Particulate organic carbon
PXRD	Powdered X-ray diffraction
R _e	Ecosystem respiration
ROC	Recalcitrant organic carbon
SD	Standard deviation
SOC	Soil organic carbon
SOM	Soil organic matter
SSA	Specific surface area
TOC	Total organic carbon
TGA	Thermogravimetric Analysis
THAM	Trisaminomethane
T-RFLP	Terminal restriction fragment length polymorphism
WANPP	Woody aboveground net primary productivity