

List of figures

	Page
(Figure I -1) What causes the sea level to change (Source: IPCC, 2001).....	1
(Figure I -2) The regional change in sea level based on the 17-year trend from 1993 through 2009.....	2
(Figure I -3): Past, present and predicted sea level trends (IPCC, 2007)	3
(Figure I -4) Coastal Impacts Due to Sea-Level Rise... ..	5
(Figure I -5) Image of storm waves in Alexandria 10 / 12 / 2012.....	7
(Figure I -6) Vulnerability and its components (Allen Consulting, 2005).....	9
(Figure I -7) explains different steps to climate change vulnerability assessment as proposed by (IPCC 2007).....	9
(Figure I -8)Map of the Mediterranean coast of Egypt showing the main land elevation and coastal ridges compile.....	14
(Figure I -9)The lower coastal plain of the Nile Delta and Alexandria.....	14
(Figure II -1) Satellite image from Abu Qir Bay to Maadia bridge Google earth 16 / 9 / 2012.....	18
(Figure II -2) Base map of Abu Qir region.....	19
(Figure II -3) relative sea level rise at Alexandria, Burullus and port said.....	22
(Figure II -4) GIS coverage of the monuments.....	28
(Figure II -5) image for archeological in Abu Qir.....	28
(Figure III -1) Prediction of pixel values using interpolation	33
Figure (III -2) Topographic profiles (Red Arrow)as obtained from Google Earth....	38
Figure (III -3) Contour lines maps.....	39
Figures (III -4): steps how to convert Polylines to points.....	40
Figure (III -5) elevation points from map.....	41
Figure (III -6) elevation points from maps with elevation SRTM.....	42

Figure (III -7) Kriging window in Arc/Map program).....	43
Figure (III -8): The resulting digital elevation model (DEM).....	44
Figure (III -9): Converting value raster to integer type to deal with.....	45
Figure (III -10): Converting the raster that is integer type to polygon to deal with...	45
Figure (III -11): Digital elevation model classification.....	46
Figure (III -12) over laying cultivated areas with DEM in Abu Qir Region.....	48
Figure (III -13) over laying residential areas with DEM in Abu Qir Region.....	49
Figure (III -14) over laying companies with DEM in Abu Qir Region.....	50
Figure (III -15) over laying schools with DEM in Abu Qir Region.....	51
Figure (III -16) over laying hospitals with DEM in Abu Qir Region.....	52
Figure (III -17) over laying health units with DEM in Abu Qir Region.....	53
Figure (III -18): Some feature classes on ARC/GIS.....	54
(Figure IV -1) Adaptation to Climate Change and Variability.....	55
(Figure V -1): cultivated areas in high, moderate and low risk	66
(Figure V -2): residential areas in high, moderate and low risk	68
(Figure V -3): Erosion in western coast line in Abu Qir	69
(Figure V -4): Excessive building in coast line in Abu Qir	70
(Figure V -5): industries areas in high, moderate and low risk	72
(Figure V -6): schools in high, moderate and low risk	74
(Figure V -7): hospitals in high, moderate and low risk	76
(Figure V -8): health units in high, moderate and low risk	77
(Figure V -9) land Percentage of classification of land use in high, moderate and low risk areas.....	78
(Figure V -10): picture show lack awareness in study areas	79
(Figure V -11): Drains discharge in Abu Qir bay	80
(Figure V -12) age classification in Abu Qir region.....	81
(Figure V -13) Service affected by SLR in Abu Qir region.....	83

LIST OF TABLES

	Page
Table (I -1) costs of recent coastal engineering works as of year 2000 prices.....	13
Table (II -1) the coordinates of the four corners points of Abu Qir region.....	19
(Table II -2) Population in Abu Qir region Source	24
(Table II -3) Employment in Montazah district source.....	25
(Table II -4)The position of the work.....	25
(Table II -5) Education in Montazah district Source	25
Table (III -1): total land use in study	36
Table (V -1): A table showing total areas in Abu Qir region.....	64
Table (V -2): approximately risk in cultivated areas in Abu Qir.....	65
Table (V -3): approximately risk in residential areas in Abu Qir.....	67
Table (V -4): approximately risk in industries in Abu Qir.....	71
Table (V -5): approximately risk in schools in Abu Qir.....	73
Table (V -6): approximately risk hospitals and health units in Abu Qir.....	75
Table (V -7): percentage areas in high, moderate and low risk	78

LIST OF ABBREVIATIONS

GIS Geographic Information System

SLR Sea Level Rise

IPCC..... intergovernmental panel on climate change

SRTM.....Shuttle Radar Topographic Mission

DEM Digital elevation model

EEA.....European Economic Area

C.A.M.P.A.S....Central agency for public mobilization and statistics

UNFCCC ...United Nations Framework Convention on Climate Change

UNIS.....United Nations International Strategy for Disaster Reduction

ESRIEnvironmental systems research institute

IDW..... Inverse Distance Weighted

GCPs..... Ground control points

GCM.....Global Climate Models