

Contents

1	General Introduction	1
1.1	Framework of the project ‘Biography of the New Land’	1
1.2	Aim and outline of this thesis	4
1.3	Synergy between archaeology and the earth sciences	5
2	A niche construction approach on the central Netherlands covering the last 220,000 years	7
	Abstract	7
2.1	Introduction	7
2.2	Palaeogeographical context and habitation history	10
2.2.1	Period 1: Middle to Late Saalian (~220–170 ka)	10
2.2.2	Period 2: Late Glacial (~14.7–11.7 ka)	11
2.2.3	Period 3: mid-Holocene (6000–5400 BP)	14
2.2.4	Period 4: Medieval and Modern Period (1200 BP up to AD 1942)	14
2.3	Hominins, landscape gradients and water in Flevoland during the last 220,000 years	15
2.3.1	Early delta inhabitants	15
2.3.2	Floodplain inhabitants	17
2.3.3	Coastal area inhabitants	17
2.3.4	Peat island inhabitants	18
2.4	Discussion	18
2.5	Conclusions	20
3	Gravel size matters: Early Middle Palaeolithic artefacts made from local Rhine and Meuse deposits in the central Netherlands	21
	Abstract	21
3.1	Introduction	21
3.2	Geographical and cultural setting	22
3.2.1	Findspots of artefact-bearing deposits	23
3.2.2	Early Middle Palaeolithic assemblages of the central Netherlands	23
3.3	Methods	23
3.3.1	Re-evaluation technological analyses flint assemblages	23
3.3.2	Mapping	24
3.3.3	Lithological analysis	24
3.4	Results and interpretation	28
3.4.1	Comparison of the largest size and amount of abrasion of complete flakes from the selected flint assemblages	28
3.4.2	Lithological analysis	29
3.5	Discussion	30
3.5.1	Artefact size and downstream fining	30
3.5.2	Artefact age	30
3.5.3	The southern North Sea area and its role in EMP hominin – environment interaction	31
3.6	Conclusion	32
4	Predictive modelling of Younger Dryas archaeological remains in southern Flevoland (central Netherlands)	33
	Abstract	33

4.1	Introduction	33
4.2	Geological and cultural setting	38
4.3	Methods	40
4.3.1	Geomorphological setting of well-dated YD archaeological sites in the Northwest European Plain	40
4.3.2	Pleistocene surface southern Flevoland	40
4.4	Results	41
4.4.1	Geomorphological setting of well-dated YD archaeological sites in the Northwest European Plain	41
4.4.2	Pleistocene surface southern Flevoland	41
4.5	Discussion and conclusions	43
5	Landscape potential for the adoption of crop cultivation: Role of local soil Properties and groundwater table rise during 6000–5400 BP in Flevoland (central Netherlands)	
	Abstract	47
5.1	Introduction	47
5.2	Geological and cultural setting	50
5.2.1	Palaeogeographical context	50
5.2.2	Local groundwater level	51
5.2.3	Habitation history	52
5.2.3.1	NW Europe	52
5.2.3.2	The Netherlands	52
5.2.3.3	Flevoland	53
5.3	Material and methods	53
5.3.1	Mapping	53
5.3.1.1	Palaeotopography and soil properties	53
5.3.1.2	Palaeohydrology	56
5.3.1.3	Archaeological remains	56
5.3.2	Core samples	58
5.3.2.1	Lithology	58
5.3.2.2	Pollen	58
5.3.2.3	End Member Modelling	58
5.4	Results	62
5.4.1	The Eem and IJssel-Vecht valleys	62
5.4.1.1	The IJssel-Vecht valley	62
5.4.1.2	The Eem valley	63
5.4.2	Lithology profiles ASK and SH	65
5.4.3	Palaeo-ecology	68
5.5	Interpretation and discussion	69
5.5.1	Lithostratigraphy	69
5.5.2	Palaeogeographical development	71
5.5.3	Crop cultivation in the Dutch wetlands	71
5.5.4	Crop cultivation in wetland areas in northwest Europe	72
5.6	Conclusions	73
6	Storms in a lagoon: Flooding history during the last 1200 years derived from geological and historical archives of Schokland (Noordoostpolder, The Netherlands)	
	Abstract	75
6.1	Introduction	75
6.2	Geological and cultural setting	77
6.2.1	Palaeogeographical context	77
6.2.2	Habitation history	79
6.3	Material and methods	80
6.4	Results and interpretation	83

6.4.1	Subdivision of the clay unit	85
6.4.2	Grain-size analysis	89
6.4.3	Paleogeographical development	91
6.5	Discussion	94
6.5.1	Coastal distance effects and embankments	94
6.5.2	Storm surges at Schokland	95
6.5.3	Event-stratigraphy	96
6.5.4	Storm surges at a regional scale	96
6.6	Conclusions	97
7	Optical dating of Late Holocene storm surges from Schokland (Noordoostpolder, The Netherlands)	
	Abstract	99
7.1	Introduction	99
7.2	Material and methods	101
7.3	Results	104
7.3.1	Lithology	104
7.3.2	Palaeo-ecological indicators	104
7.3.3	Geochronology	106
7.4	Discussion and Conclusions	106
7.4.1	Subdivision clay unit	106
7.4.2	Geochronology unit 3	106
7.5	Summary	108
8	General discussion	109
8.1	Introduction	109
8.2	Palaeogeography and presence of archaeological remains in Flevoland	109
8.2.1	Palaeogeography and presence of archaeological remains in the late Middle to Late Saalian (220–170 ka, early Middle Palaeolithic)	110
8.2.2	Palaeogeography and presence of archaeological remains in the Younger Dryas (12.9–11.7 ka, late Final Palaeolithic)	111
8.2.3	Palaeogeography and presence of archaeological remains in the mid-Holocene (6000–5400 BP, Early Neolithic)	116
8.2.4	Palaeogeography and presence of archaeological remains in the Late Holocene (1200 BP up to AD 1942, Medieval period and Modern history)	117
8.2.5	Synopsis palaeogeography and presence of archaeological remains in Flevoland on four time windows	118
8.3	Preservation of past landscapes and landscape exploitation potential	118
8.3.1	Preservation of landscapes and exploitation potential in the late Middle to Late Saalian (220–170 ka, early Middle Palaeolithic)	120
8.3.2	Preservation of landscapes and exploitation potential in the Younger Dryas (12.9–11.7 ka, late Final Palaeolithic)	121
8.3.3	Preservation of landscapes and exploitation potential in the mid-Holocene (6000–5400 BP, Early Neolithic)	122
8.3.4	Preservation of landscapes and exploitation potential in the Late Holocene (1200 BP up to AD 1942, Medieval period and Modern history)	123
8.3.5	Synopsis preservation of past landscapes and information on landscape exploitation on four time windows	124
8.4	Lithological characteristics of the investigated landscapes	124
8.4.1	Lithology in the late Middle to Late Saalian (220–170 ka, early Middle Palaeolithic)	124
8.4.2	Lithology in the Younger Dryas (12.9–11.7 ka, late Final Palaeolithic)	125
8.4.3	Lithology in the mid-Holocene (6000–5400 BP, Early Neolithic)	126
8.4.4	Lithology in the Late Holocene (1200 BP up to AD 1942, Medieval period and Modern history)	126

8.4.5	Synopsis lithological characteristics of the investigated landscapes on four time windows	127
8.5	Hominin Niche Construction approach	128
8.6	Intervening periods of investigation from the Early Glacial (115–75 ka, late Middle Palaeolithic) to the Late Holocene (2000–1600 BP, Iron Age and Roman Period)	128
8.6.1	Late Middle Palaeolithic and late Middle to early Late Palaeolithic	129
8.6.2	Final Palaeolithic	129
8.6.3	Late Final Palaeolithic and Early to Middle Mesolithic	129
8.6.4	Iron Age and Roman Period	130
8.7	Inceptive versus counteractive change in Flevoland: Comparing NCT mode of hominin – environment interaction over four time windows	130
8.8	Conclusion	131
References		133
Summary		161
Samenvatting		165
Acknowledgements		169