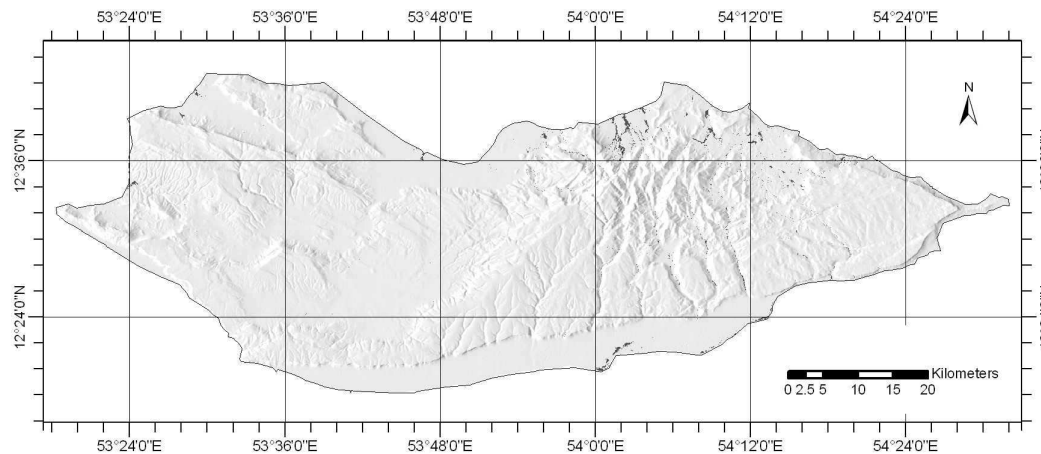
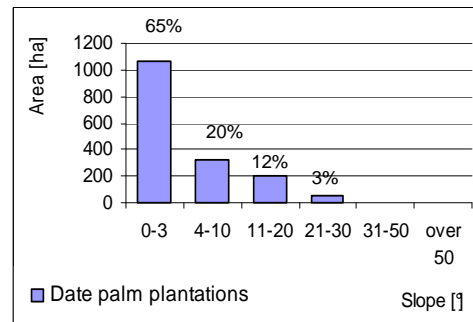
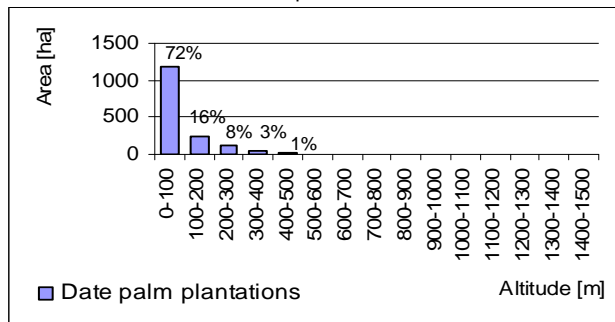


(21) Date palm plantations



Own description: Date palm plantations *Phoenix dactylifera* on the coast and also in wadis of the central part. Present over small areas along the most of the wadis and coastal lagoons. They occur in particular along streams north and south of Haggeher mountains, which are receiving a water supply from relatively humid mountains

Distribution of altitudes and slopes within the Land-Cover class:



LCC Label: Monoculture Of Continuous Large To Medium Sized Field(s) Of Needleleaved Evergreen Tree Crop(s)

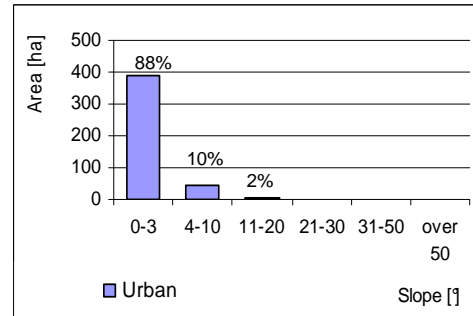
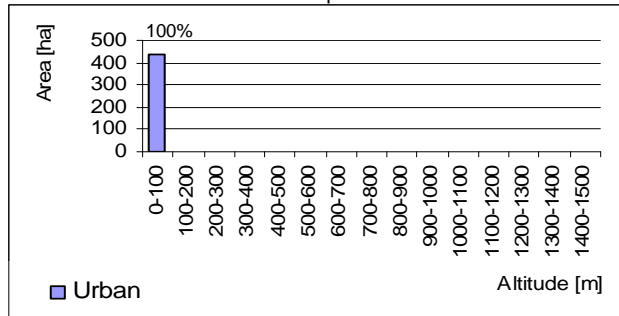
LCC Level: A1B1B5C1-A8A9

(22) Urban

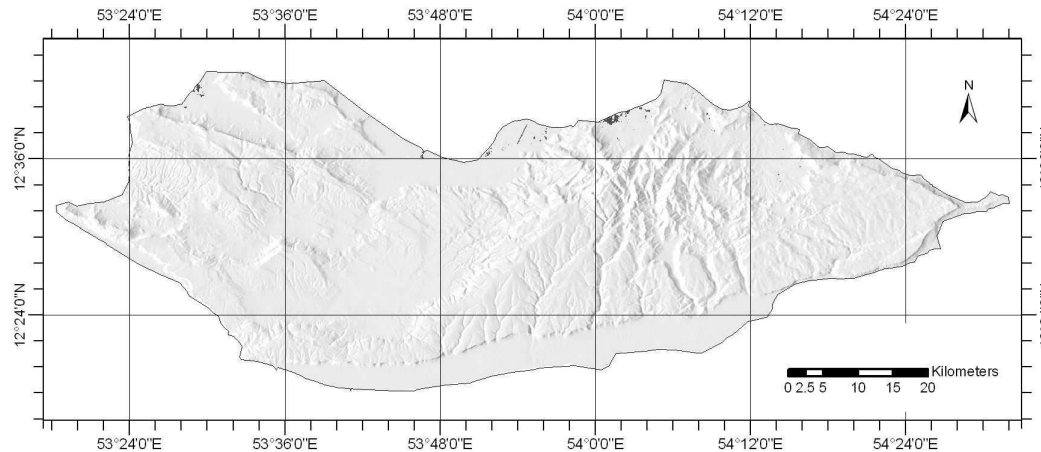


Own description: the class more or less restricted to two major sites on the northern coast: Hadiboh (and surrounding villages) in central part and Qalansiyah in the northwest. The Mouri Airport and some surrounding villages were recognised as well.

Distribution of altitudes and slopes within the Land-Cover class:



Vegetation cover of the class is very scarce, for the main limited to some native and introduced tree species that are planted in small home gardens. In some enclosures various grasses and herbs occur and, if not grazed, they are capable to fruit



LCC Label: Urban Area(s)

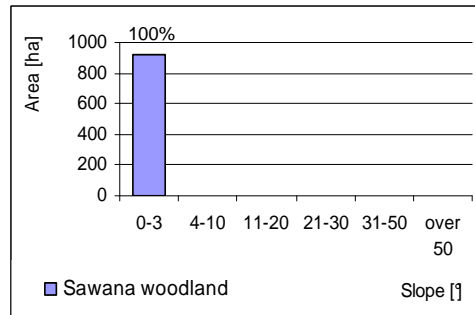
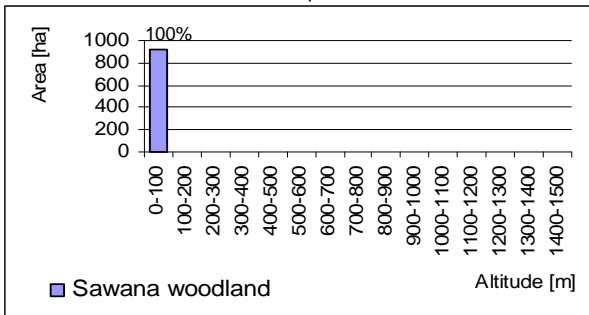
LCC Level: A4-A13

(23) Sawana woodland

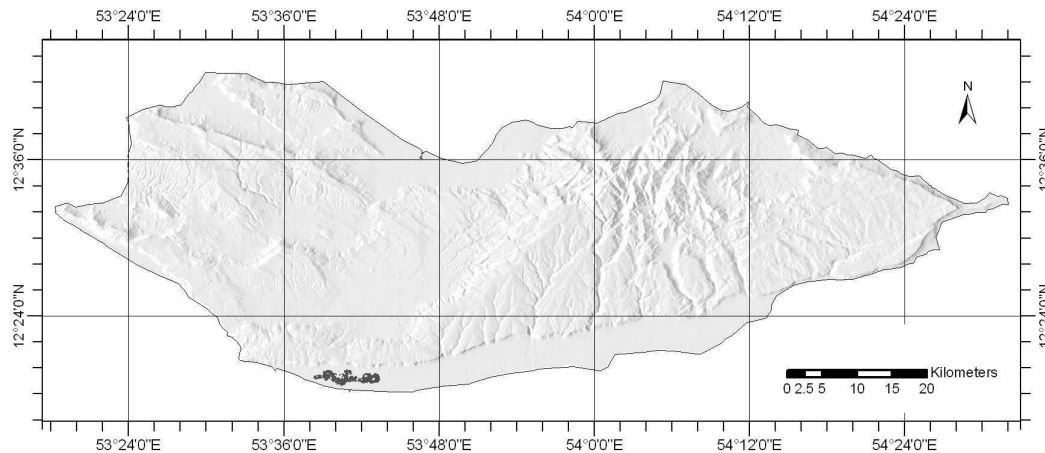


Own description: for Socotra extraordinary vegetation type occupies solely limited area (approximately 900ha) of the Qa'arah plain in the south. As it develops (in contrast to the Frankincense woodland) only on the coastal plain, the topography is formed by altitudes ranging from 10 to 50m in elevation, while the slopes are not exceeding 3°

Distribution of altitudes and slopes within the Land-Cover class:



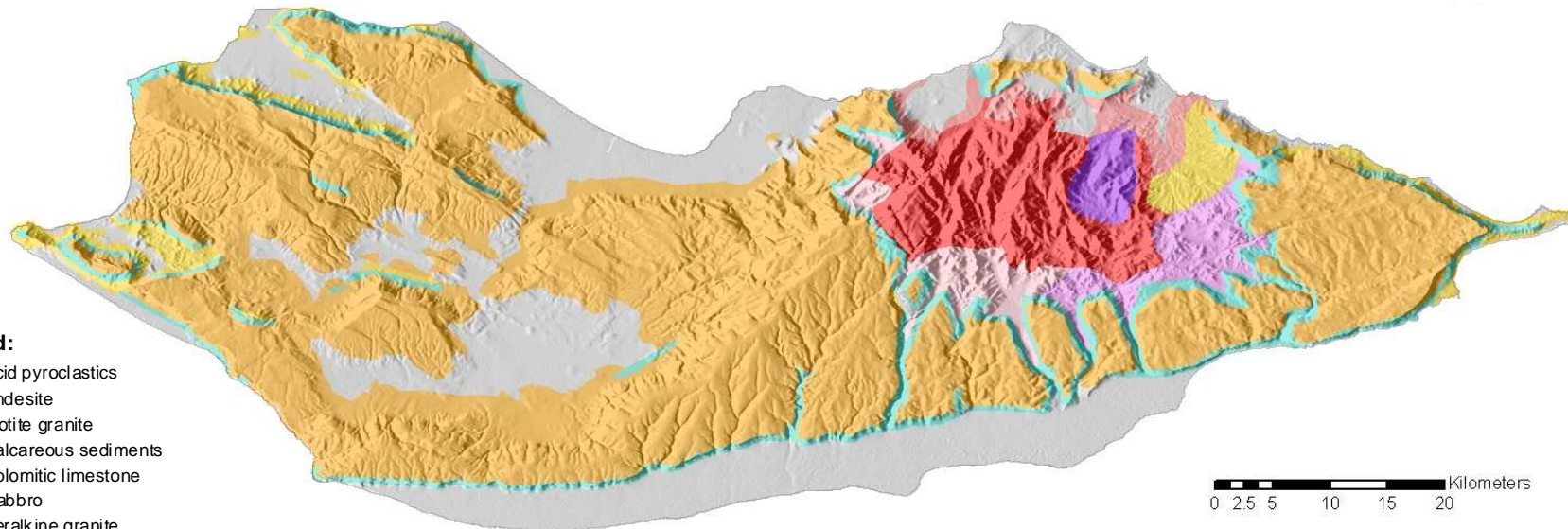
A sparse tree layer of the deciduous woodland (canopy about 5%) is dominated by *Commiphora ornifolia* and *Maerua angolensis* var. *socotrana*, occasionally *Dendrosicyos socotrana* and *Euphorbia arbuscula*. The shrub layer is composed of common species of coastal plains such as *Croton socotranus*, *Jatropha unicostata*, *Cissus subaphylla*, etc.



The LCC label: Semi-Deciduous (40 - (20-10)%) Woodland With Open Medium High Shrubs; Major Landclass: Level Land, Plain, Slopeclass: Flat to Almost Flat; Lithology: Sedimentary rock; Climate: Tropics - Dry semi-arid; Altitude: < 50 m; Erosion: Visible Evidence of Erosion; Floristic Aspect: *Commiphora ornifolia*;

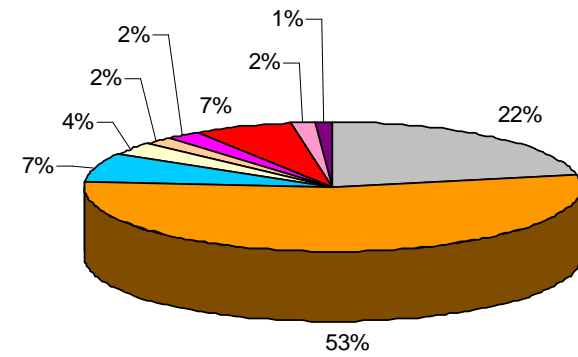
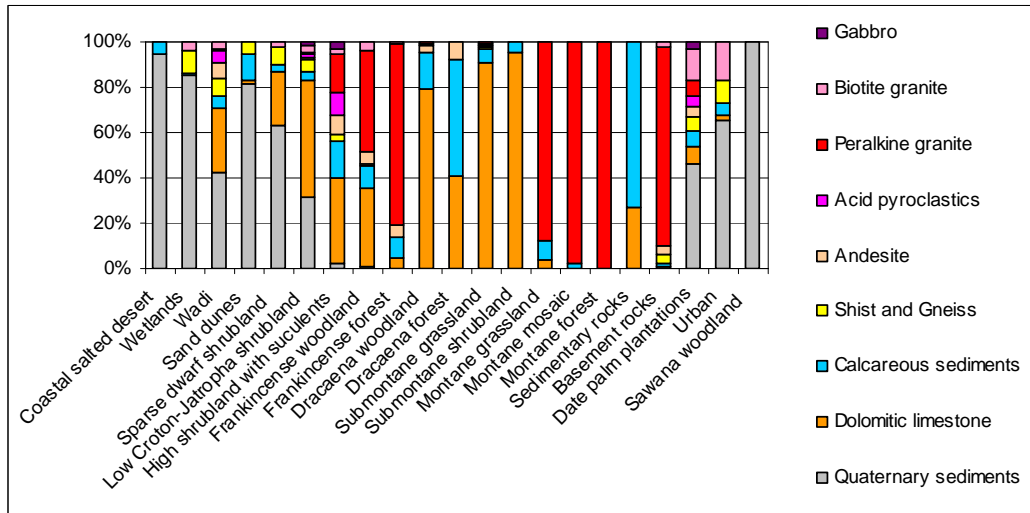
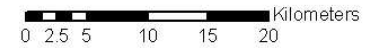
LCC level A3A11B2C1D1E2F2F6F7G3F1-A13B7E4F9G9-L11L5M2N1128O1O1 1P5Q2Zt22.

Geologie x Landcover

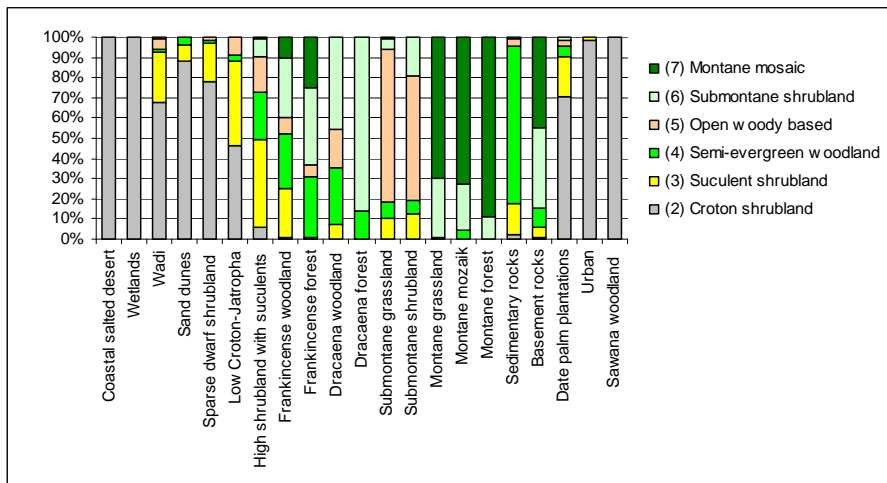
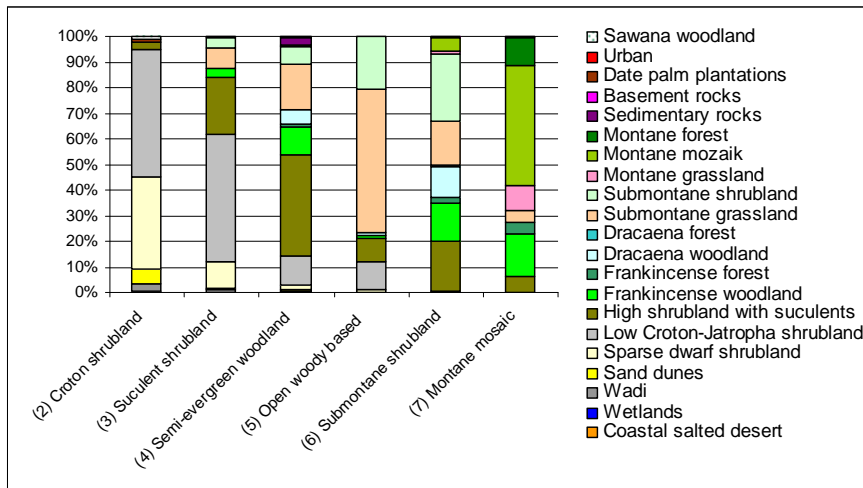
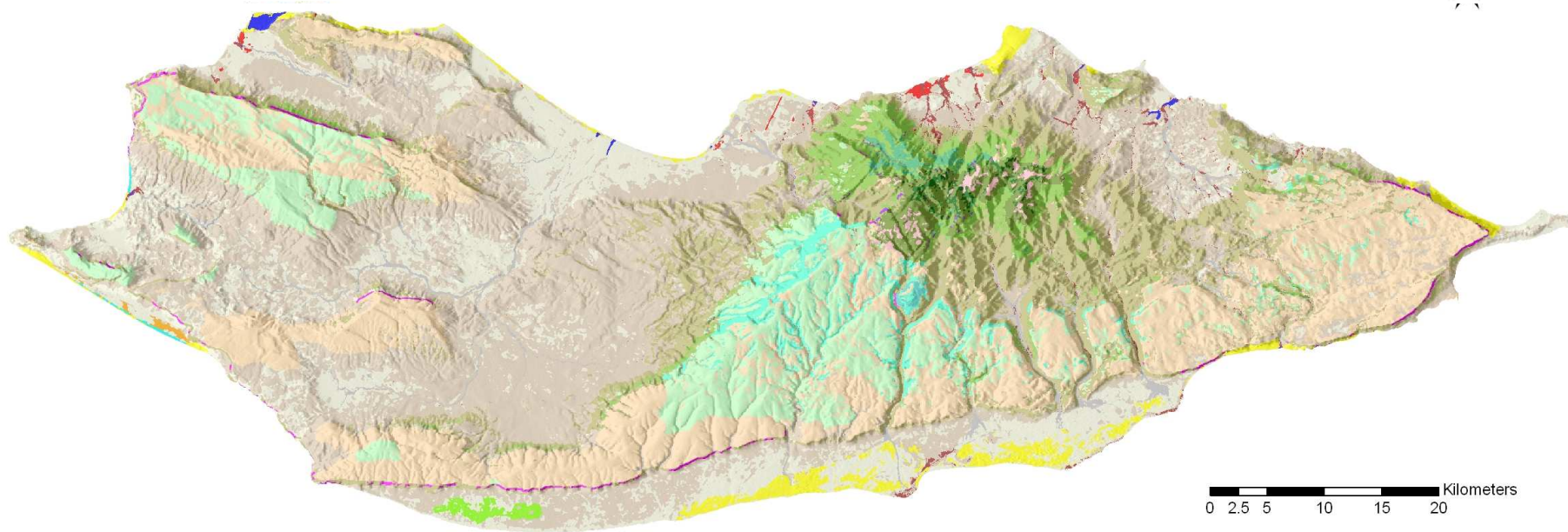


Legend:

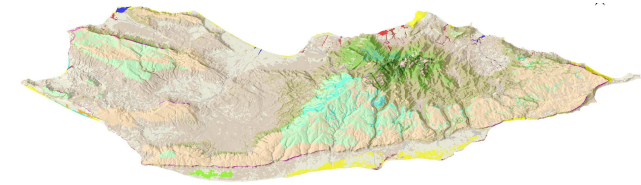
- Acid pyroclastics
- Andesite
- Biotite granite
- Calcareous sediments
- Dolomitic limestone
- Gabbro
- Peralkine granite
- Quaternary sediments
- Shist and Gneiss



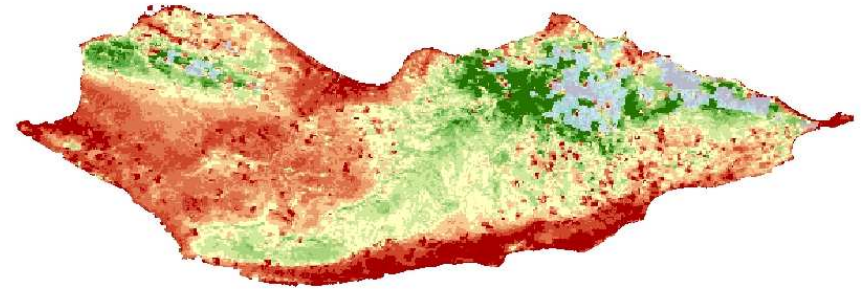
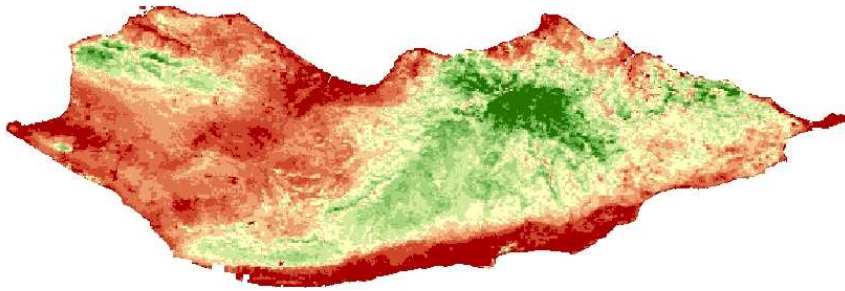
Porovnání mapy hlavních vegetačních typů (Miller & Morris 2000, 2004) a nové Land-cover mapy



Závěry – mapování krajinného pokryvu:

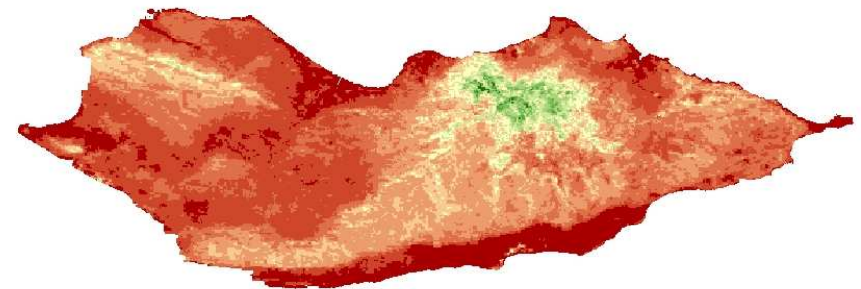
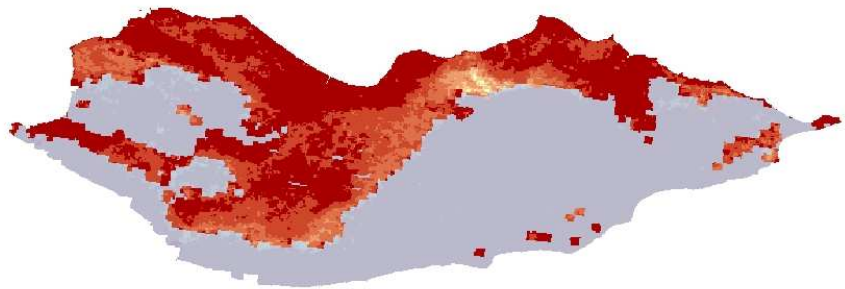


- detailní land-cover mapa ostrova by nemohla být zhotovena ve srovnatelné kvalitě, při stejných nákladech a ve srovnatelném čase pouze na základě terénního průzkumu
- začlenění dat DPZ a navazujících technik zpracování do procesu mapování přináší výrazné zlepšení polohové a tématické přesnosti při současném snížení časové a finanční náročnosti
- použitá metoda dává výsledky s uspokojivou polohovou a tématickou přesností (odhadovaná celková přesnost mapy rozlišující 22 tříd je 80%)
- pomocí navazujících GIS analýz je možné získávat velmi cenné informace jako je např. celková plocha a relativní zastoupení jednotlivých land-cover tříd na ostrově, jejich lokalizace a charakteristiky ekotopu, atd.
- možnost odhadovat současný a někdy i potenciální výskyt vzácných druhů (příklad dávají unikátní biotopy endemického druhu *Dracaena cinnabari* – dračincové lesy a háje), což je zásadní pro jejich další ochranu a management
- získané informace mohou být také velmi zajímavé pro donorskou komunitu a jako takové velmi důležité pro efektivní „fund rising“



PART II:

Seasonal dynamics of main vegetation formations of Soqotra and its relation to monsoonal rainfalls



Objectives:

- to contribute to the understanding of seasonal dynamics of vegetation cover of Soqotra (sustainable agro-forestry management can not be implemented without understanding of seasonal dynamics of vegetation and its causalities),
- to contribute to the understanding of seasonal dynamics of climate – in particular rainfalls – in different parts of the island

Approach:

- the use of data and techniques of Remote Sensing (in particular MODIS VI)
 - accessibility of data
 - spatially comprehensive overview
 - effectiveness

NDVI (Normalized Difference Vegetation Index):

- is robust spectral transformation of two (visible and near infrared) bands designed to enhance the 'vegetation signal' and allow for reliable spatial and temporal inter-comparisons of photosynthetic activity
- correlates with both, the status and abundance of the green vegetation cover

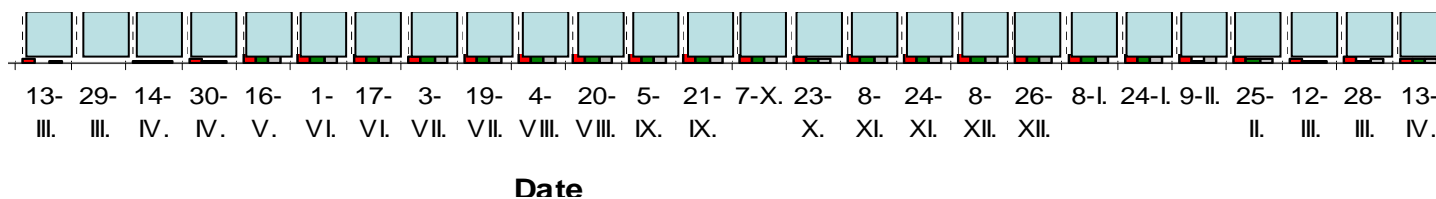
MODIS (Moderate Resolution Imaging Spectroradiometer) NDVI data:

- set of 16-day NDVI composites at 250m spatial resolution

(<http://edcdaac.usgs.gov/datapool/datatypes.asp>)

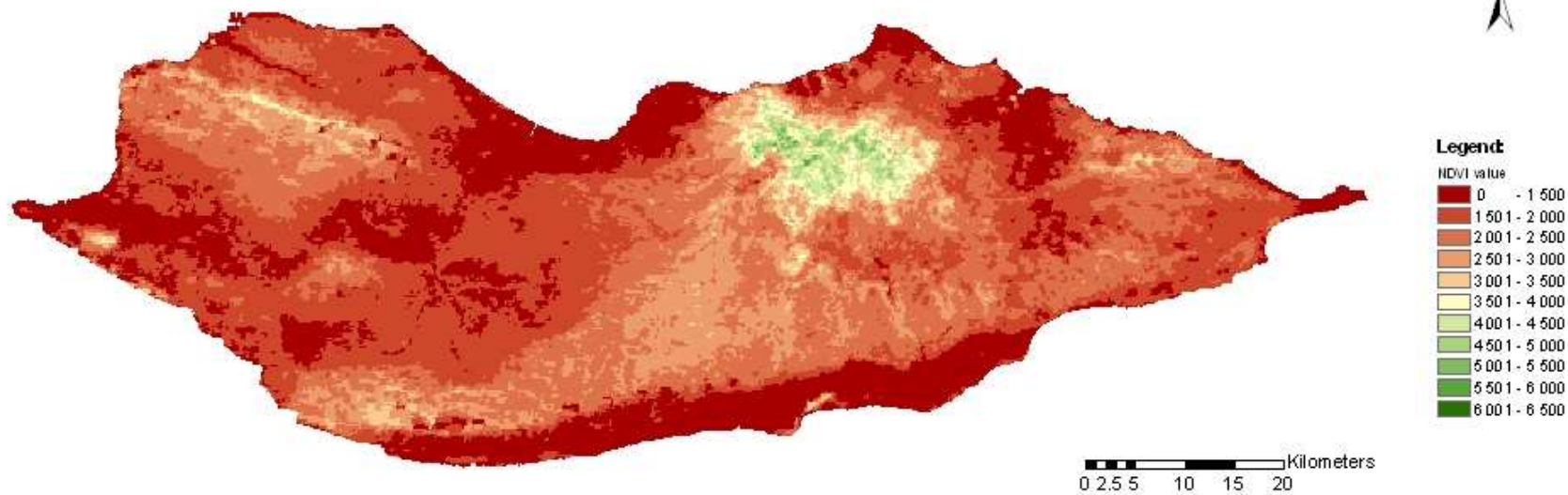
Studium dynamiky vegetace ostrova

Použití časových řad vegetačních indexů (NDVI) družice MODIS



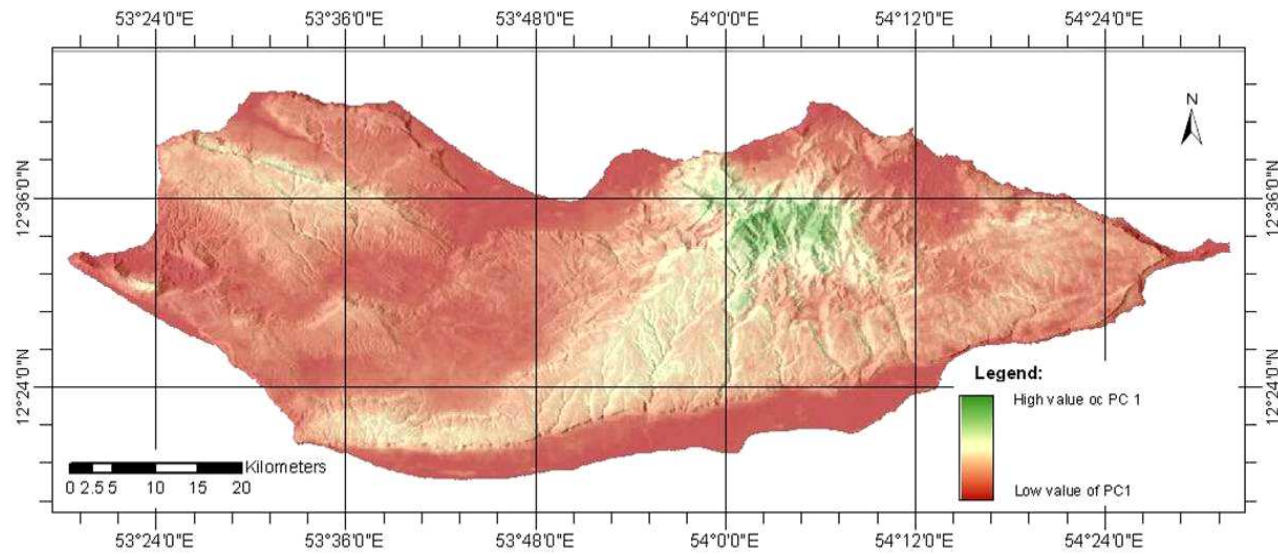
04_097: 13.4.2004

MODIS - NDVI 16 days composite from 6.4.2004 to 21.4.2004

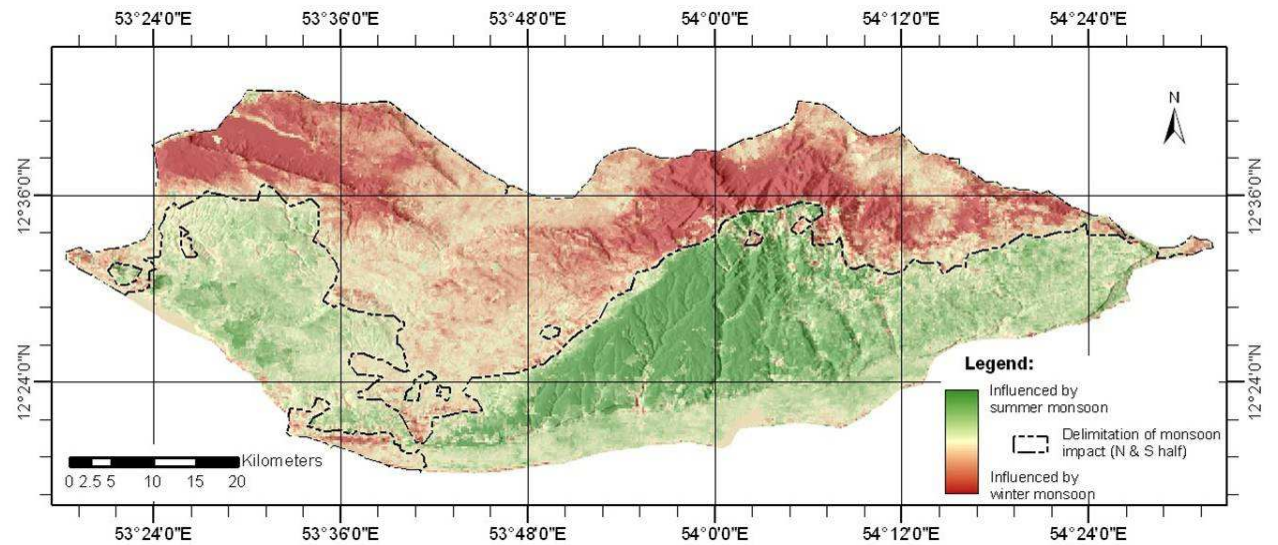


Analýza časových řad - Principal Component Analysis

PC 1:

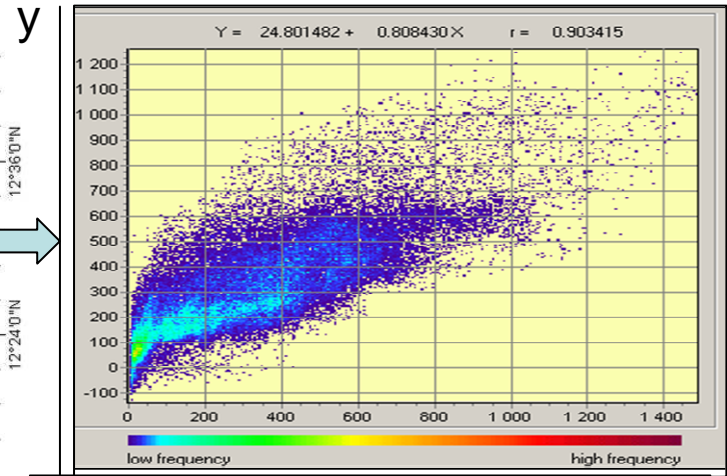
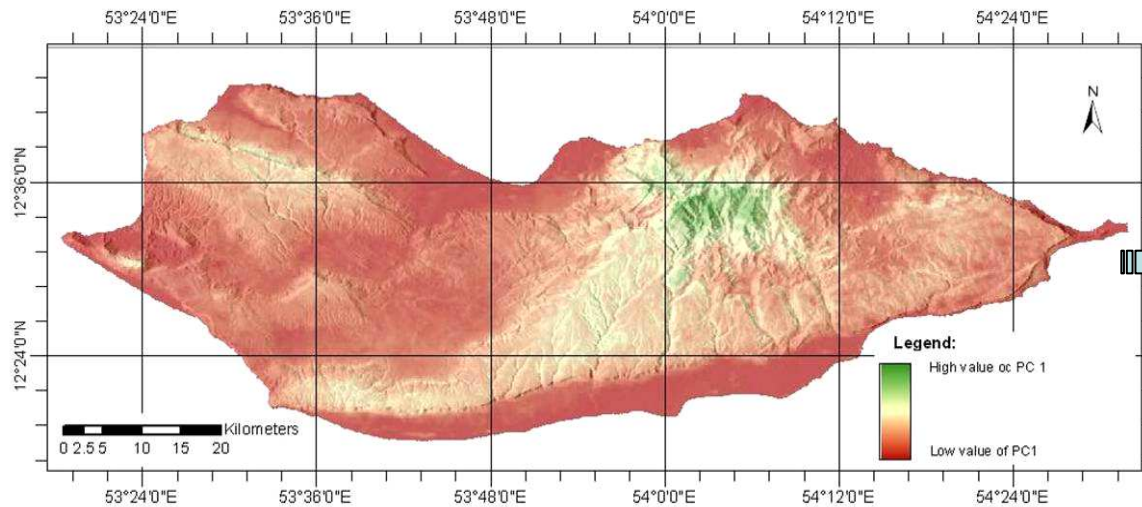


PC 2:

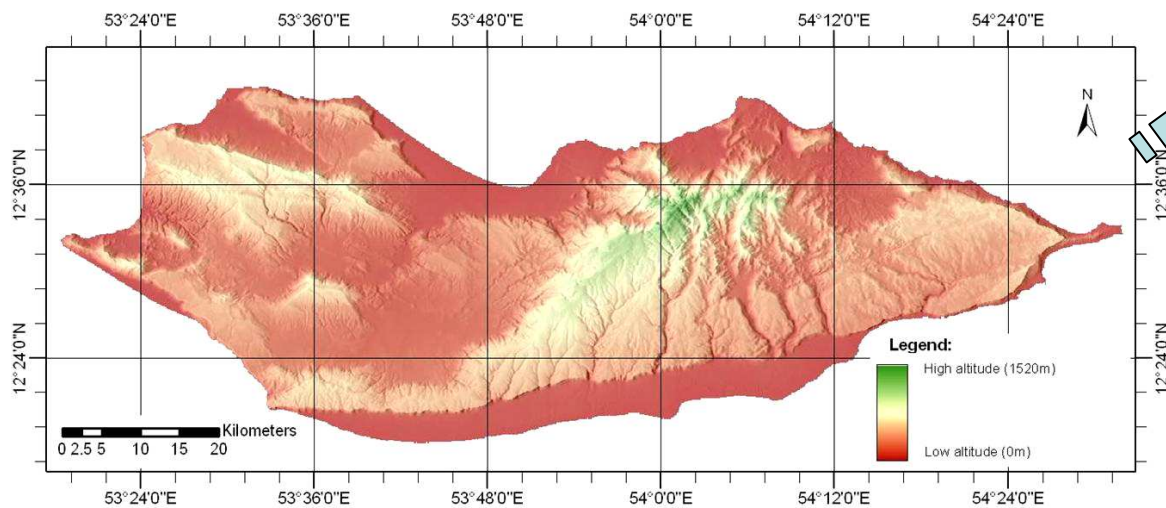


Regresní analýza:

PC 1:



DEM – Altitude:

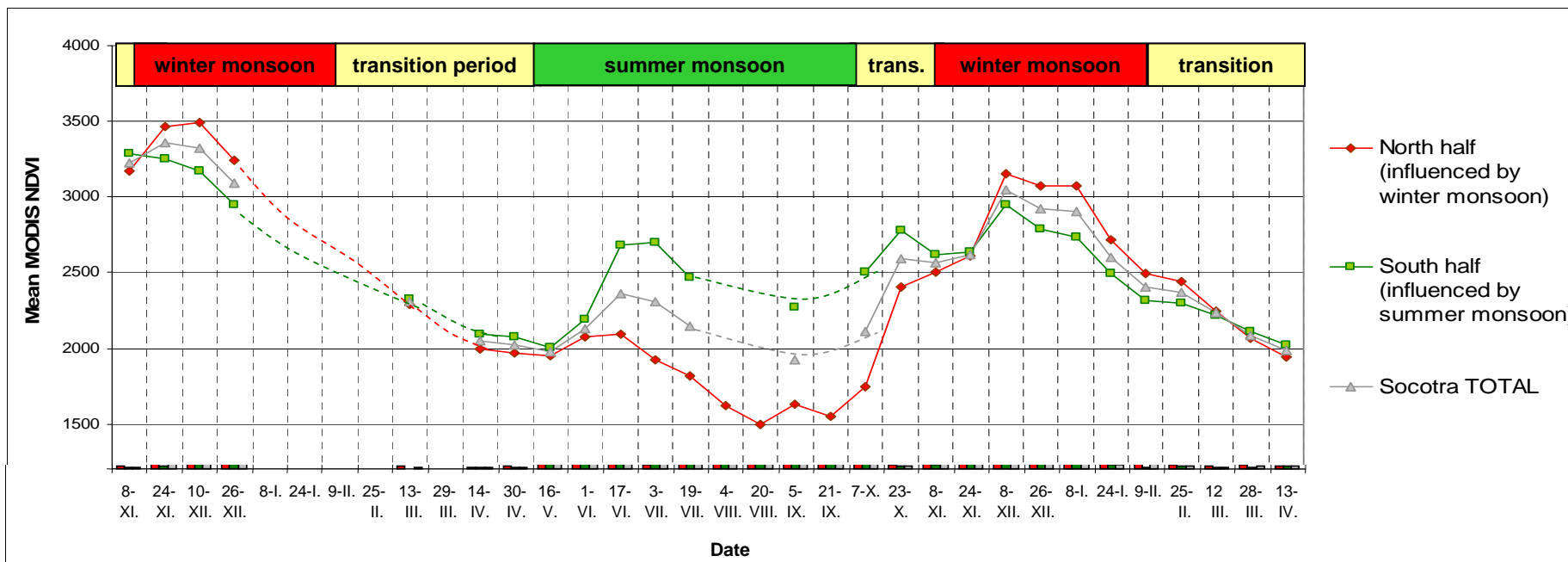
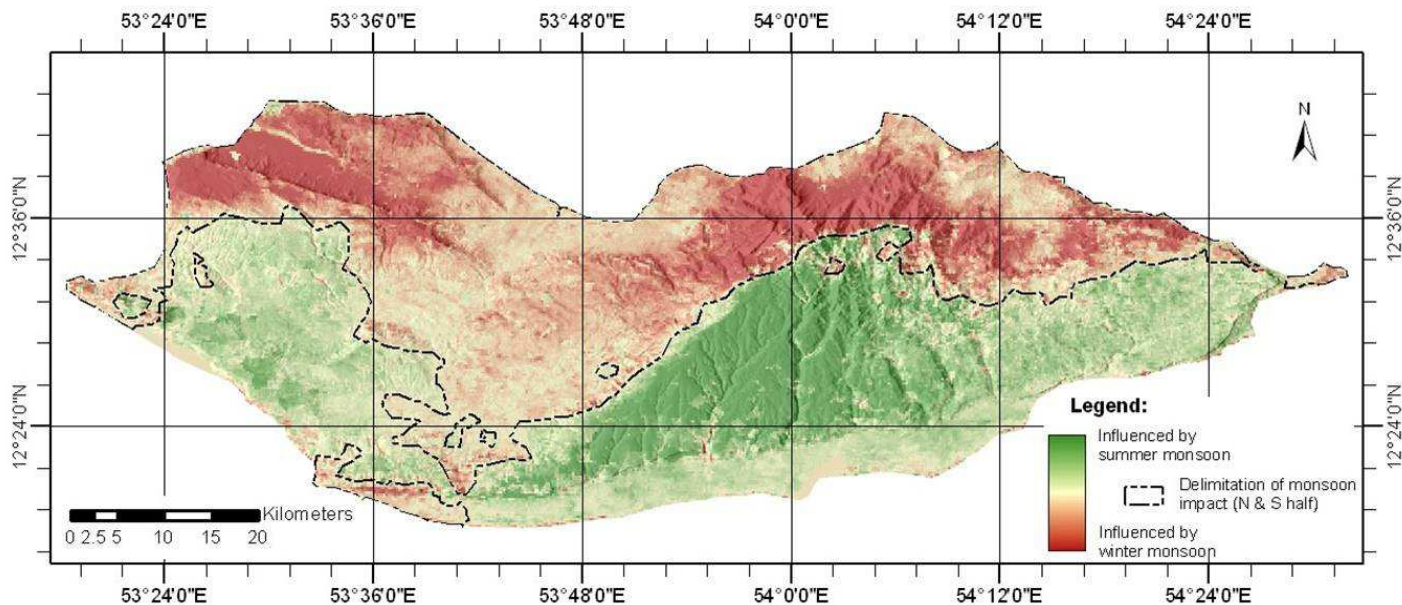


Regression Parameters:

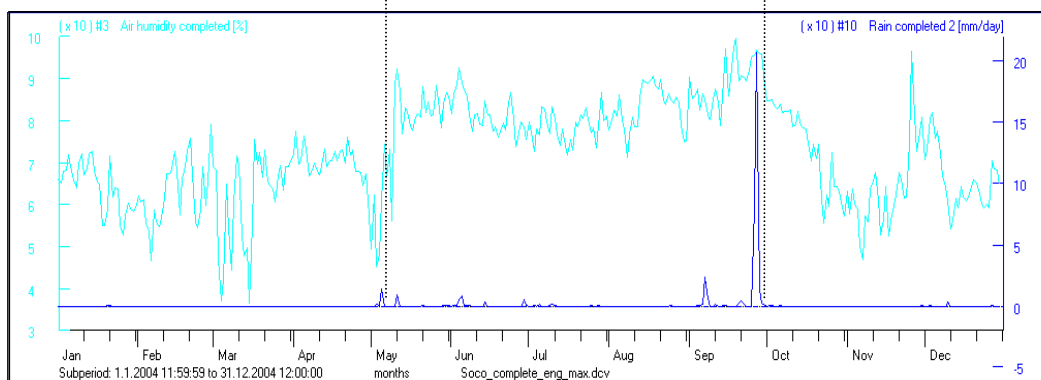
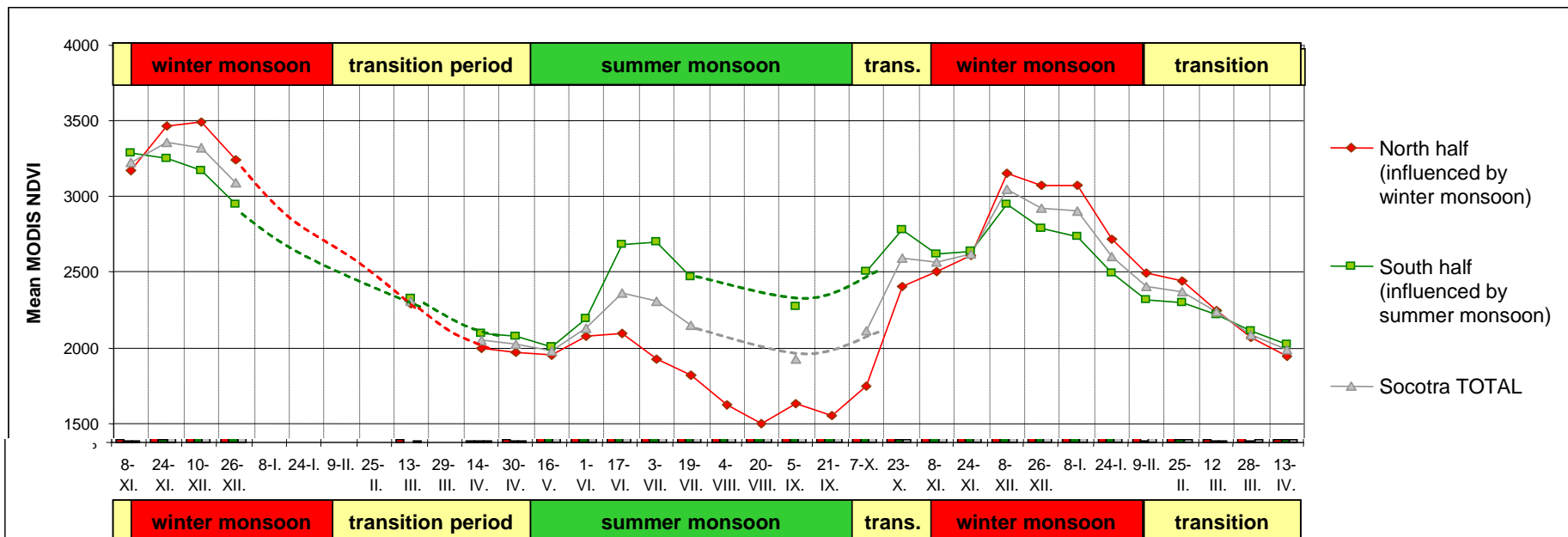
X axis: dem_250m00
 Y axis: tsa-cmpl_00

Coeff. of Det.	=	81.62 %
Std. Dev. of X	=	221.235753
Std. Dev. of Y	=	197.975101
S.E. of Estimate	=	84.885328
Std. Error of Beta	=	0.000973
t Stat for r or Beta	=	830.835350
t Stat for Beta <> 1	=	-196.879227
Sample Size (n)	=	155491
Apparent df	=	155489

Časový profil:

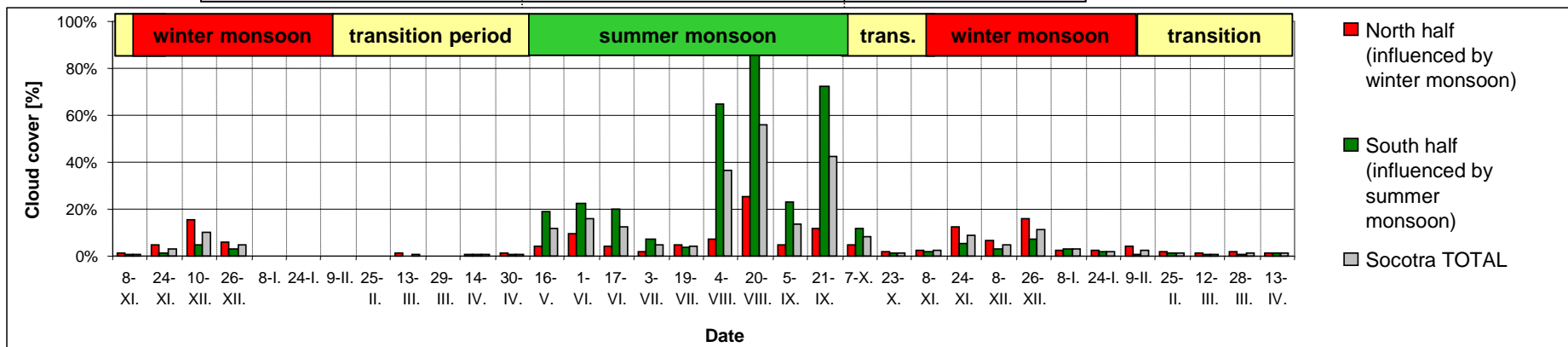
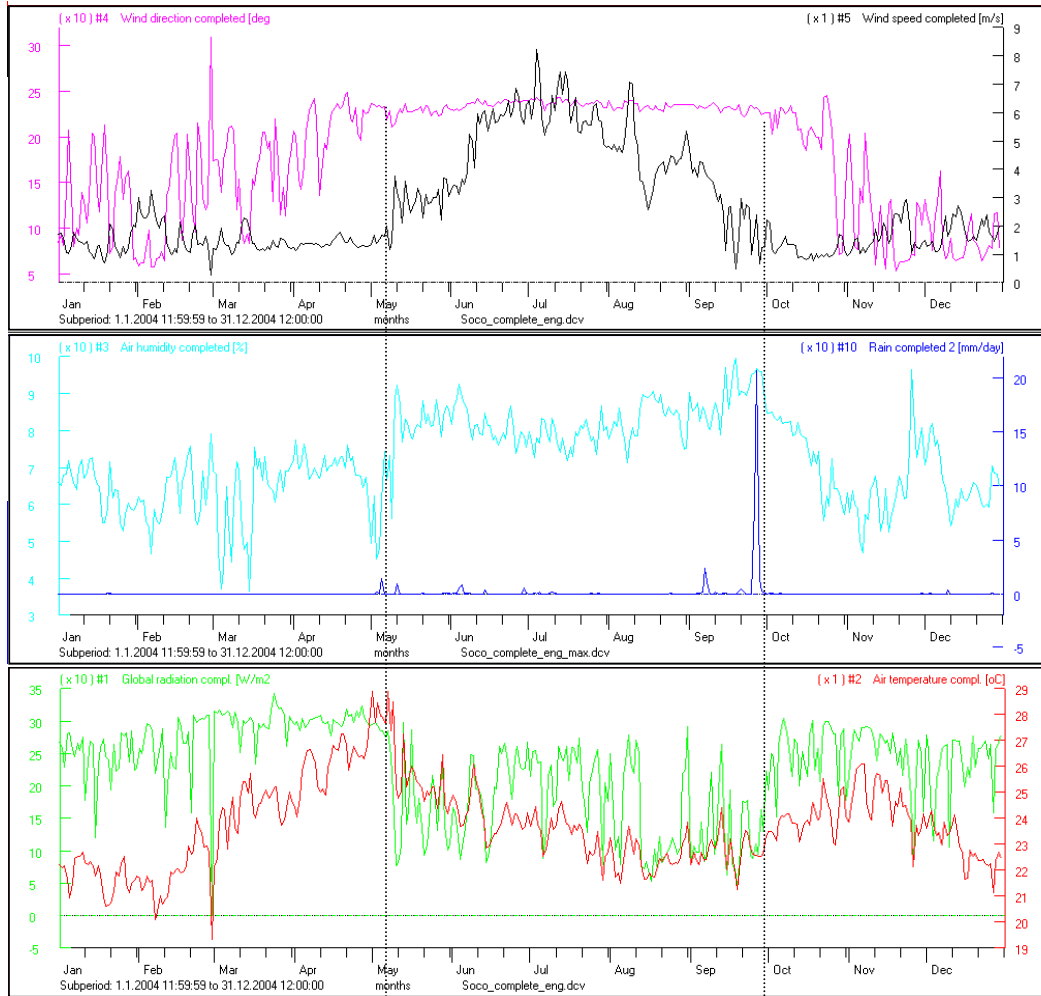


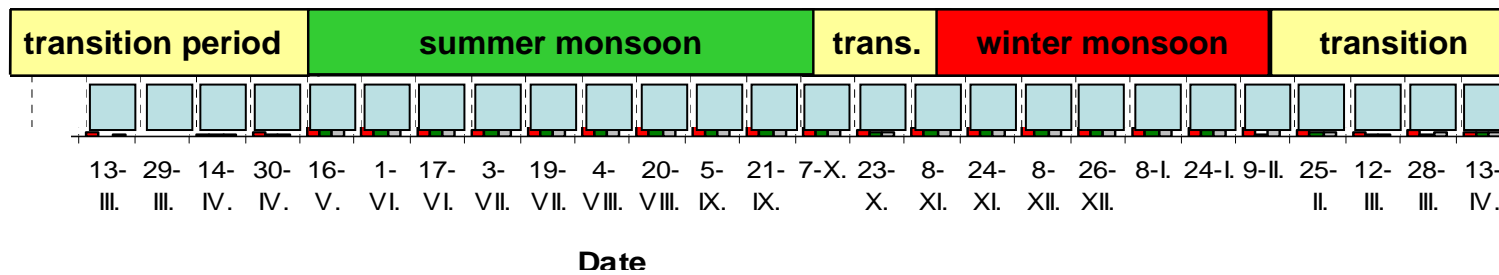
Časový profil:



Firmihin weather station
440 m above sea level
(south "half" of the island)

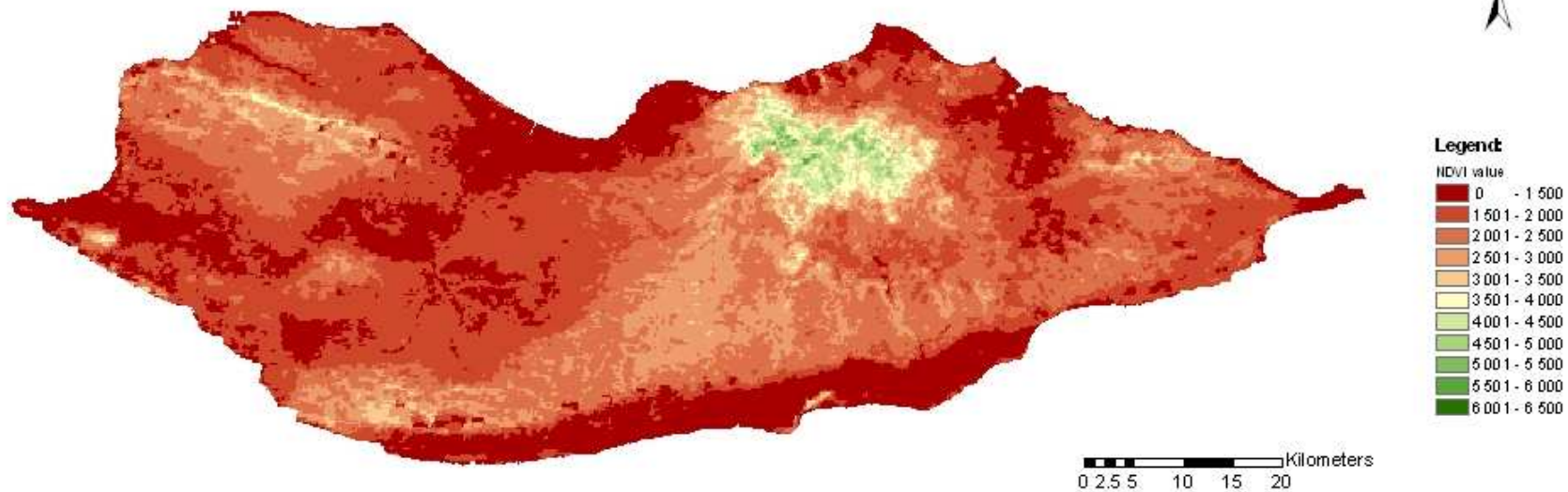
Firmihin weather station
 440 m above sea level
 (south "half" of the island)



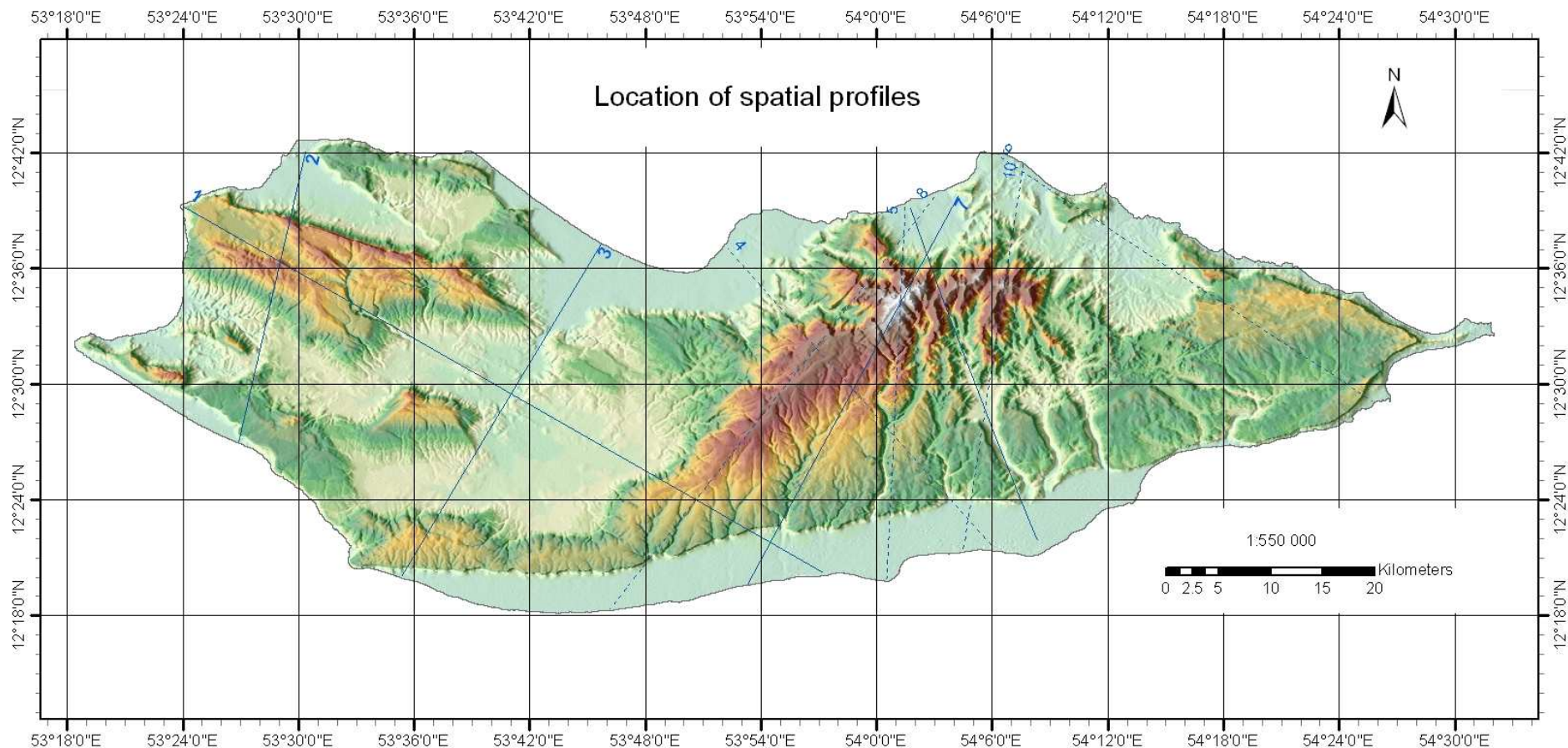


04_097: 13.4.2004

MODIS - NDVI 16 days composite from 6.4.2004 to 21.4.2004



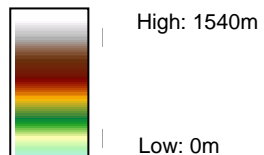
Prostorové profily:



Legend:

- 1 Spatial profiles described in detail
- - - 0 Other spatial profiles

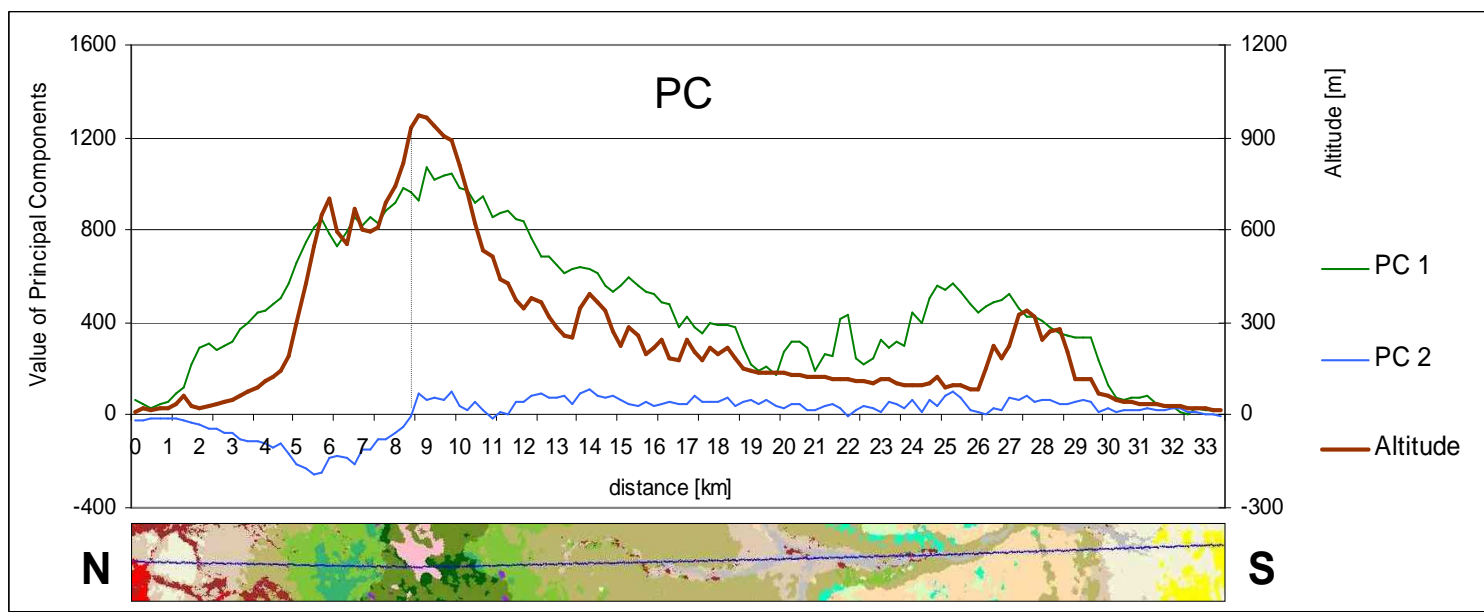
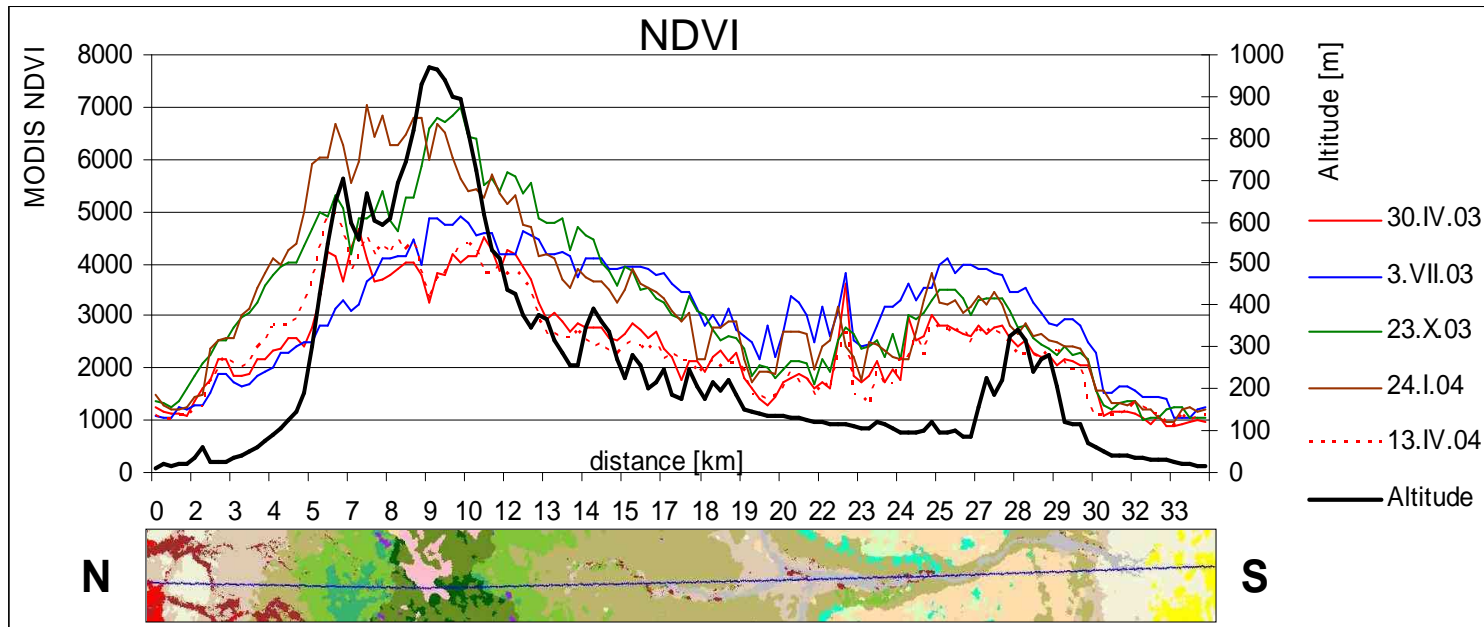
Altitude:

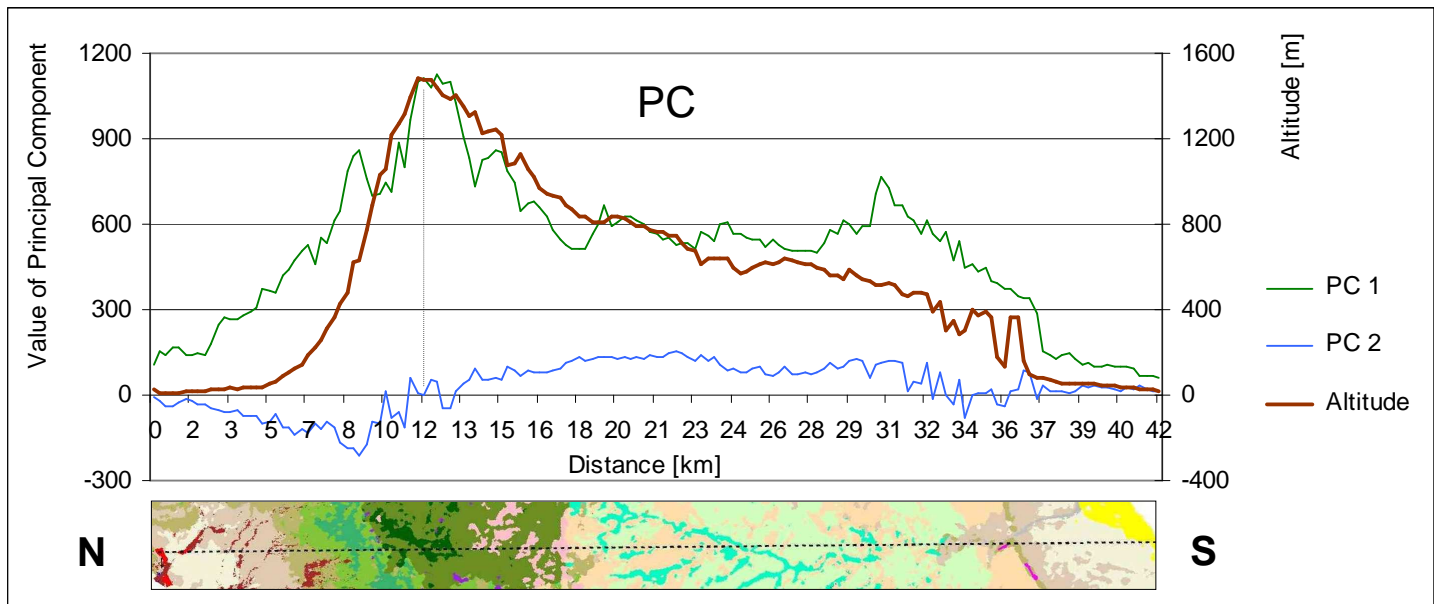
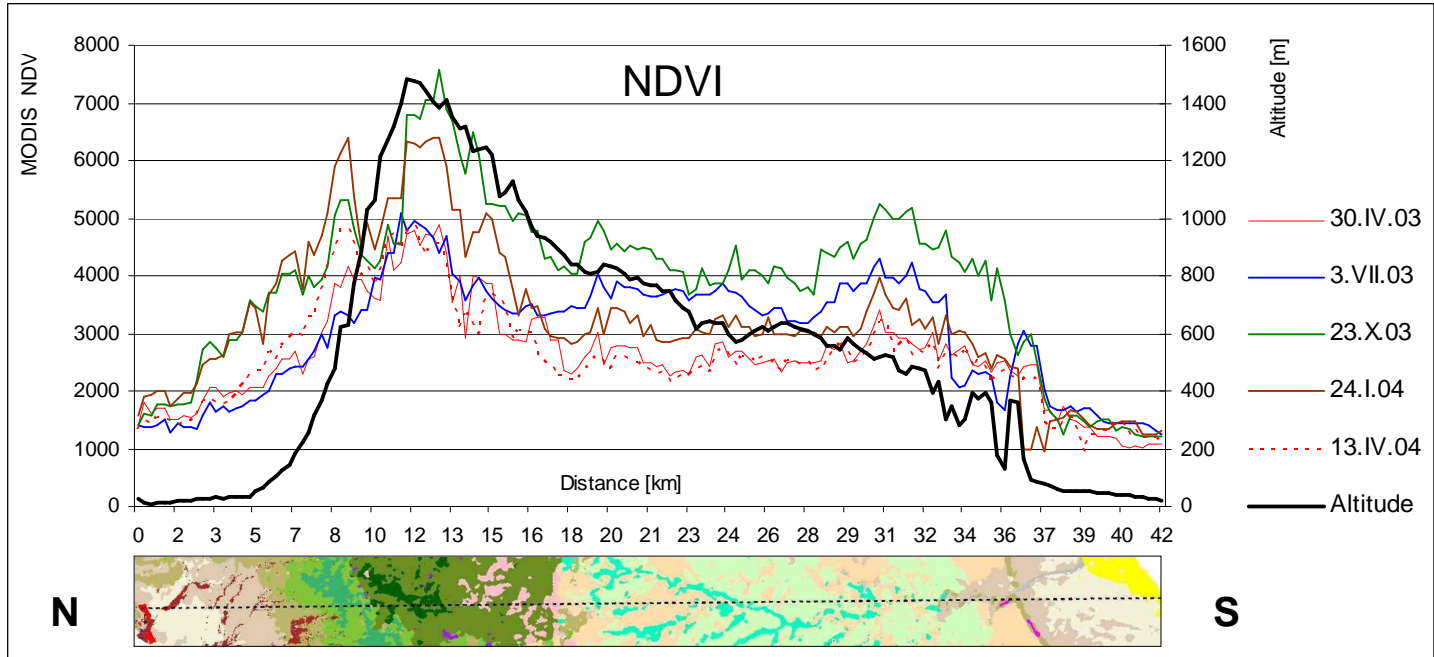


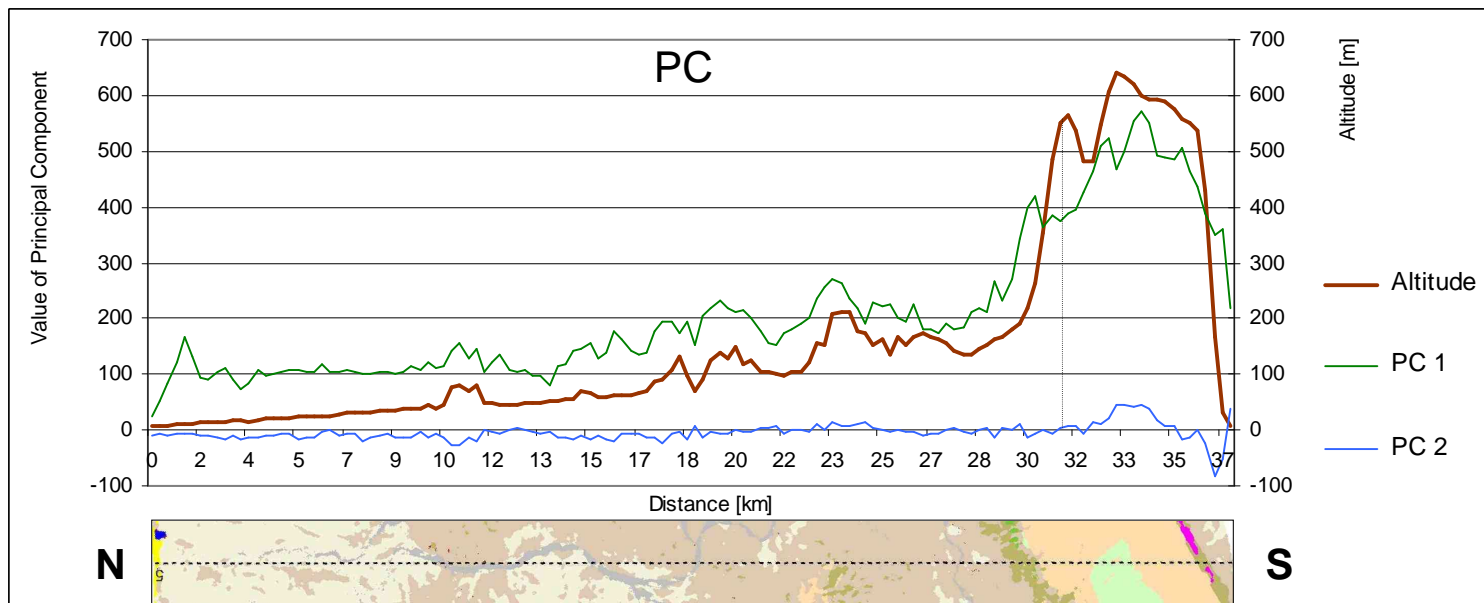
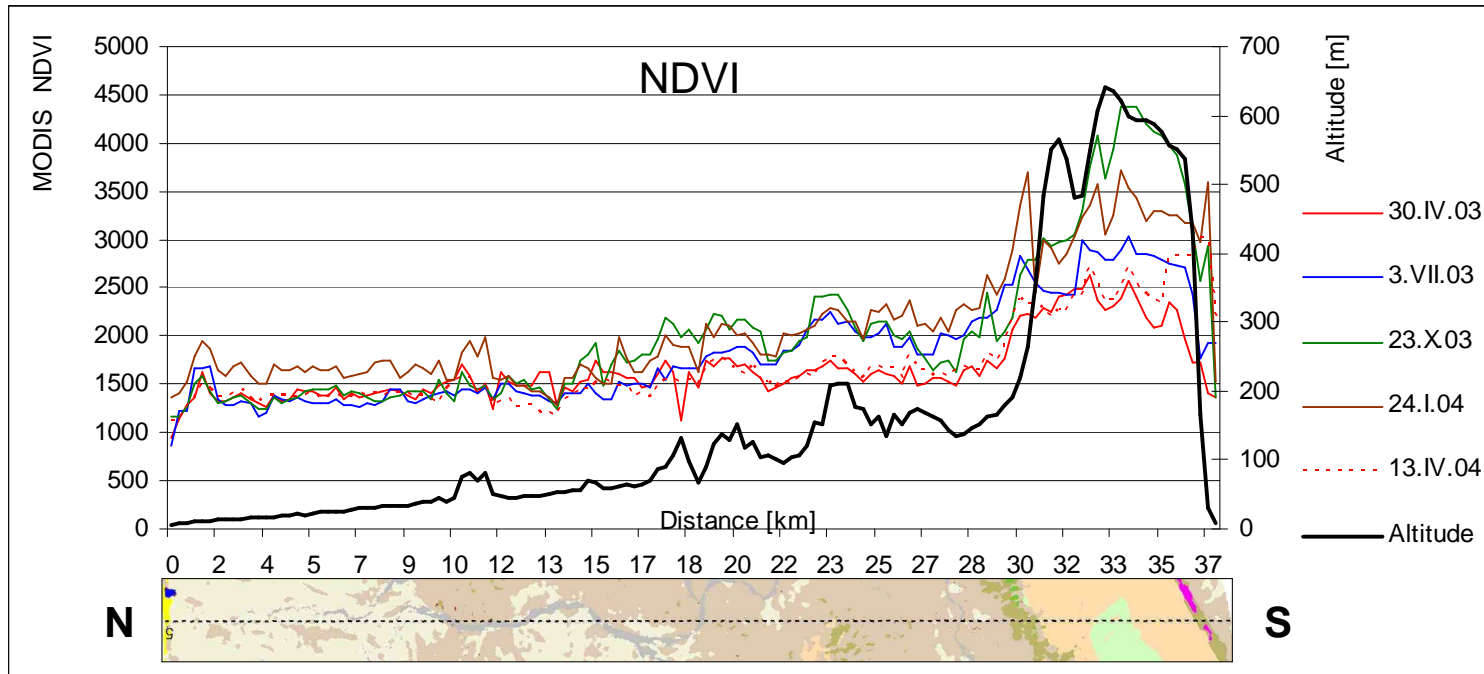
Legend (altitude):

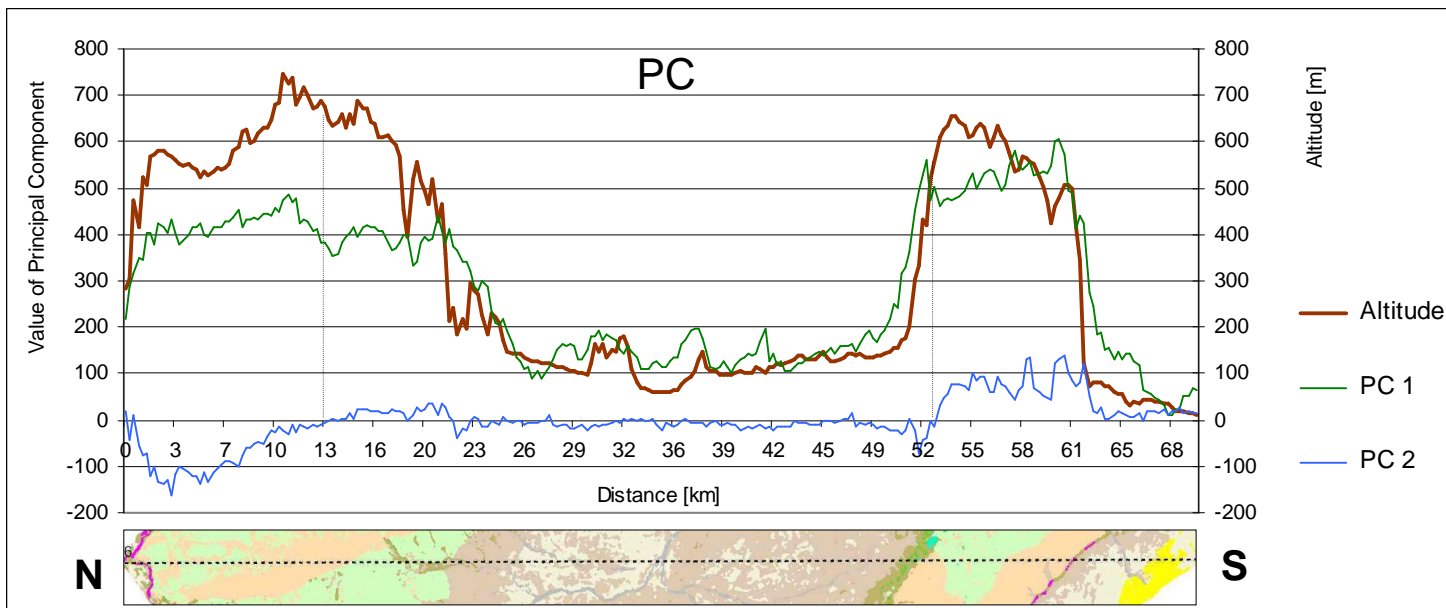
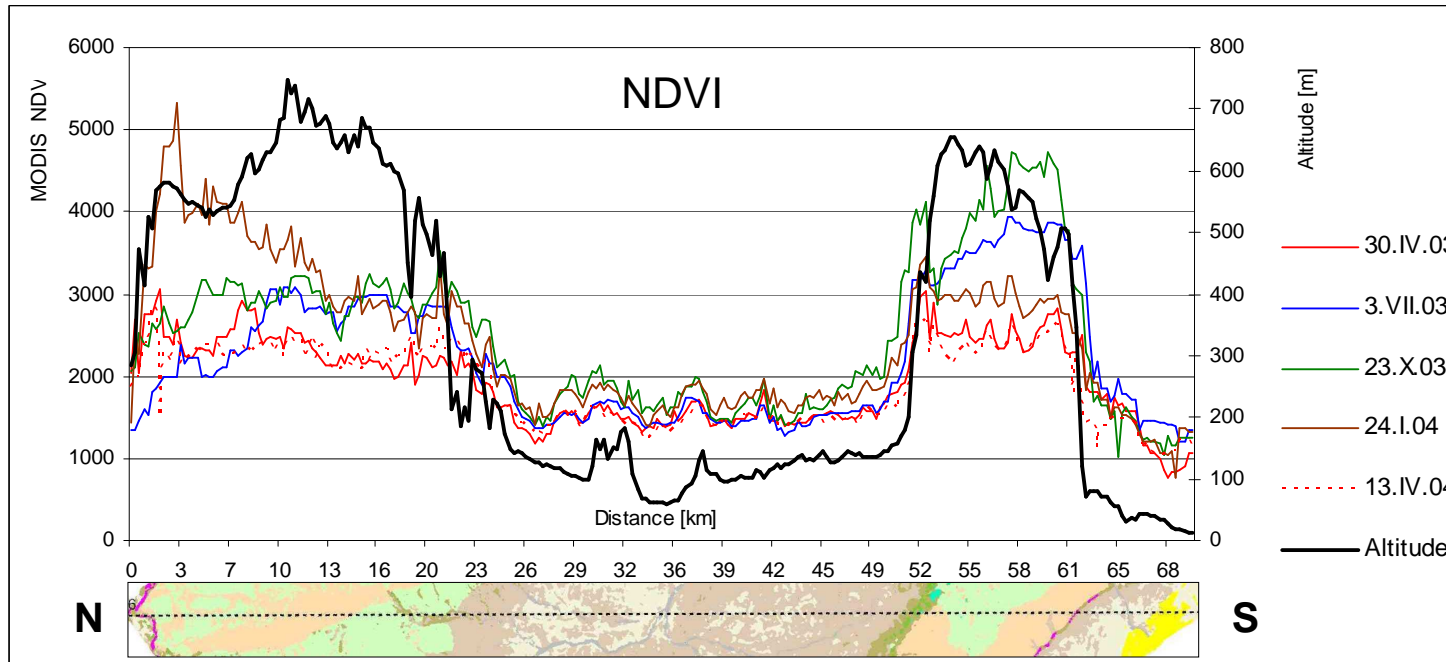
Value of Altitude (meters above sea level)

0 - 50	750-800
50-100	800-850
100-150	850-900
150-200	900-950
200-250	950-1000
250-300	1000-1050
300-350	1050-1100
350-400	1100-1150
400-450	1150-1200
450-500	1200-1250
500-550	1250-1300
550-600	1300-1350
600-650	1350-1400
650-700	1400-1450
700-750	over 1450

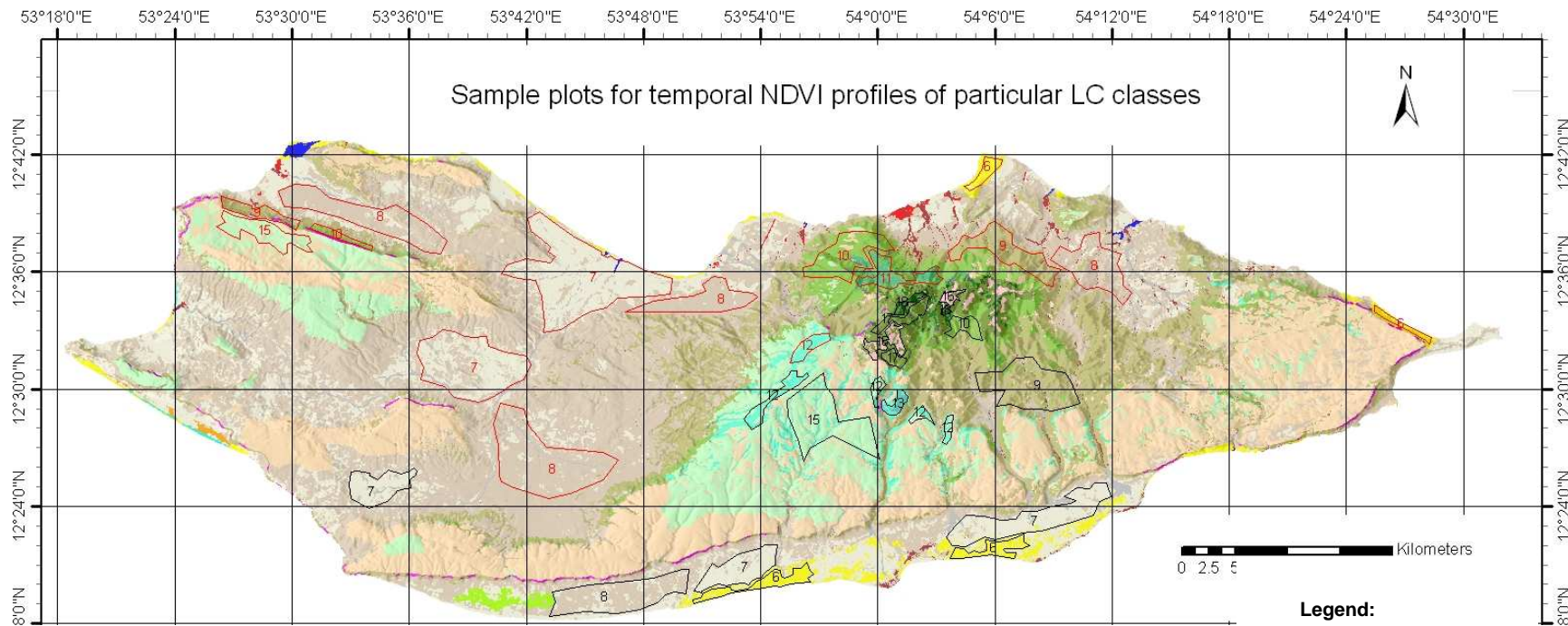






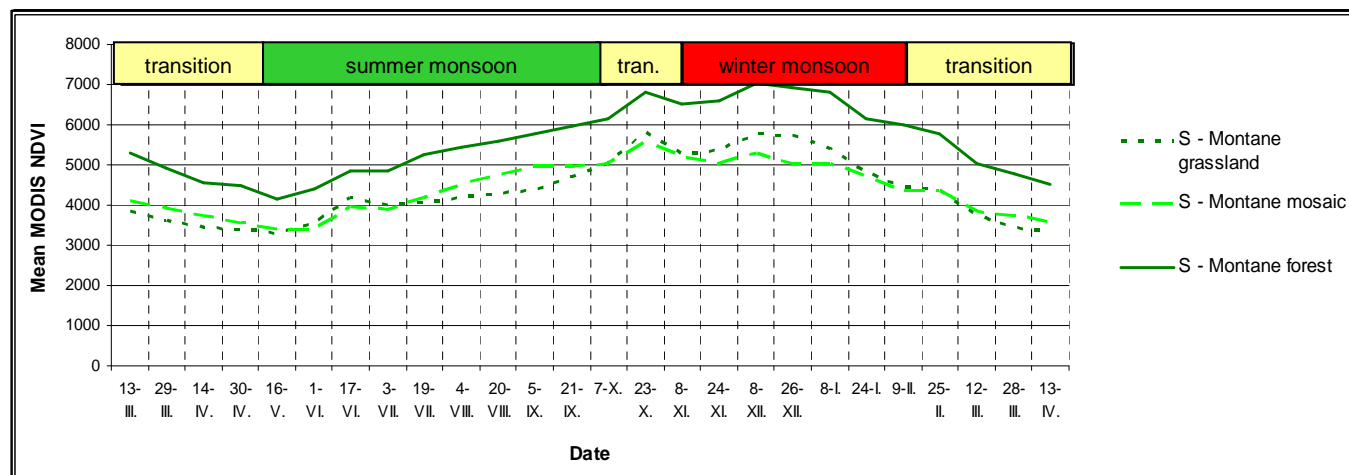


Časové profily:



6 Sample plots for temporal NDVI profiles of particular LC classes (Southern side)
6 Sample plots for temporal NDVI profiles of particular LC classes (Northern side)

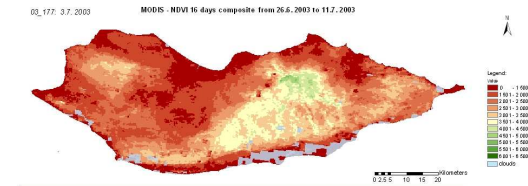
Montane biotopes



Legend:

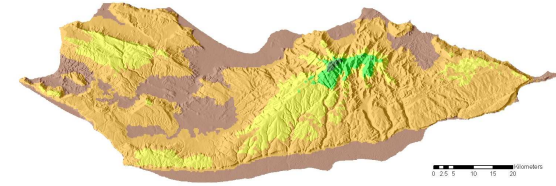
- (1) Sea
- (2) Mangroves
- (3) Coastal salted desert
- (4) Wetlands
- (5) Wadi
- (6) Sand dunes
- (7) Sparse dwarf shrubland
- (8) Low Croton-Jatropha shrubland
- (9) High shrubland with succulents
- (10) Frankincense woodland
- (11) Frankincense forest
- (12) Dracaena woodland
- (13) Dracaena forest
- (14) Submontane grassland & dwarf shrubland
- (15) Submontane shrubland
- (16) Montane grassland
- (17) Montane mosaic
- (18) Montane forest
- (19) Sedimentary rocks
- (20) Basement rocks
- (21) Date palm plantations
- (22) Urban
- (23) Savanna woodland

Závěry – sezónní dynamika vegetace:



- analýza časové řady dat NDVI velmi efektivně popisuje fenologii vegetace ostrova včetně příčinných souvislostí
- lokalizace určitého stanoviště (zda leží na severní či jižní polovině ostrova) je z hlediska fenologie jeho vegetace velmi důležitá
- hodnocení ročních úhrnů a sezónního rozdělení srážek by mělo být vždy vztahováno ke konkrétní lokalitě (extrémní variabilita na relativně malých územích)
- žádoucí pokračovat ve sledování hodnot NDVI a jejich prostorových a časových (sezónních i meziročních) kolísání i v dalších letech:
 - významným prostředkem pro rozpoznání a monitoring extrémních klimatických událostí (např. příliš dlouhá suchá období, abnormálně vlhké či suché roky, atd.) a jejich vlivu na vegetaci ostrova
 - užitečný nástroj pro odhady srážek

PART III:

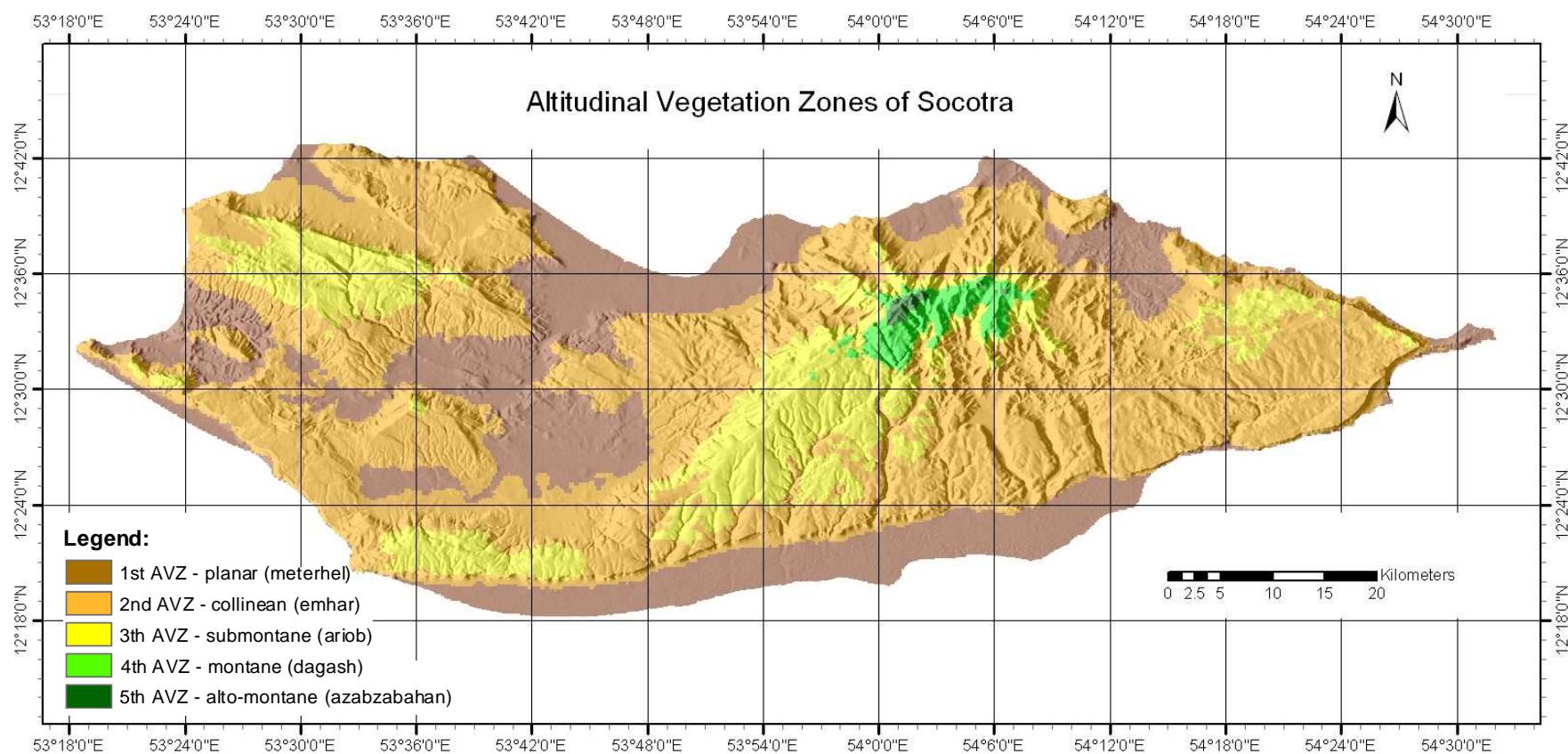


Outline mapping of Altitudinal Vegetation Zones (AVZ)

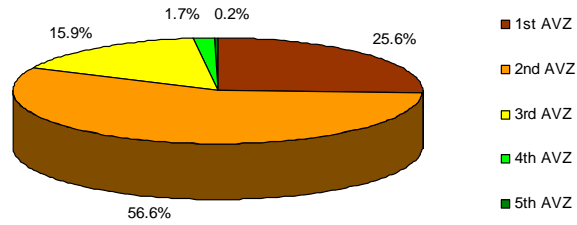
- Altitudinal Vegetation Zones (vegetation tiers), in general, express the connection of the sequence of differences in vegetation with the sequence of differences in altitudinal and exposure climate
- They vary from each other in general level (amount) of green biomass, in variability of vegetation activity within a year and in length of vegetation season
- Serve as an essential background for any successful agro-forestry management

Rámcové mapování vegetačních stupňů

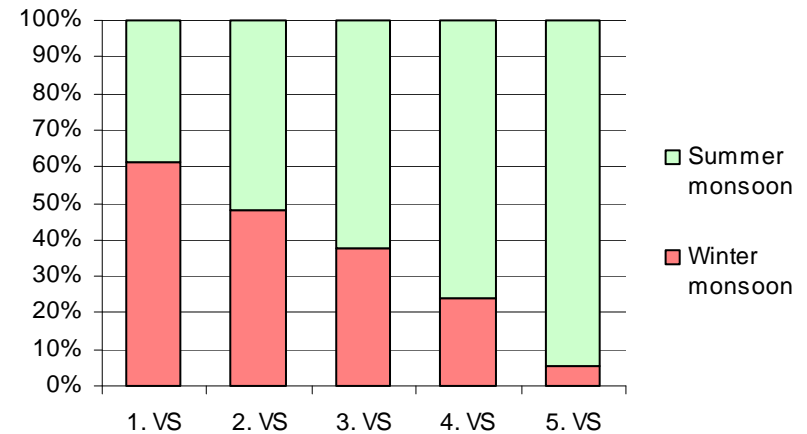
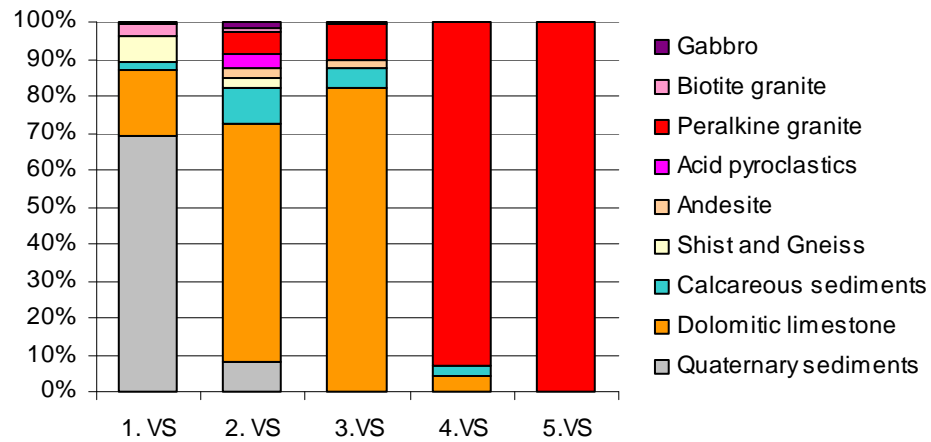
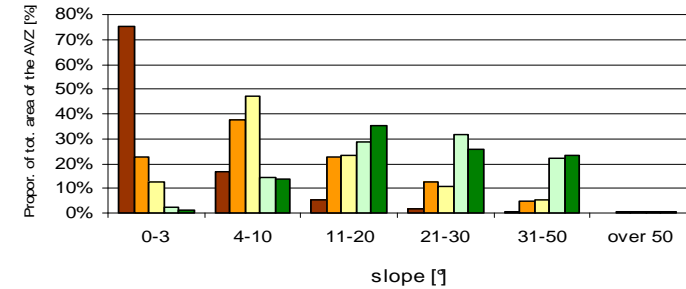
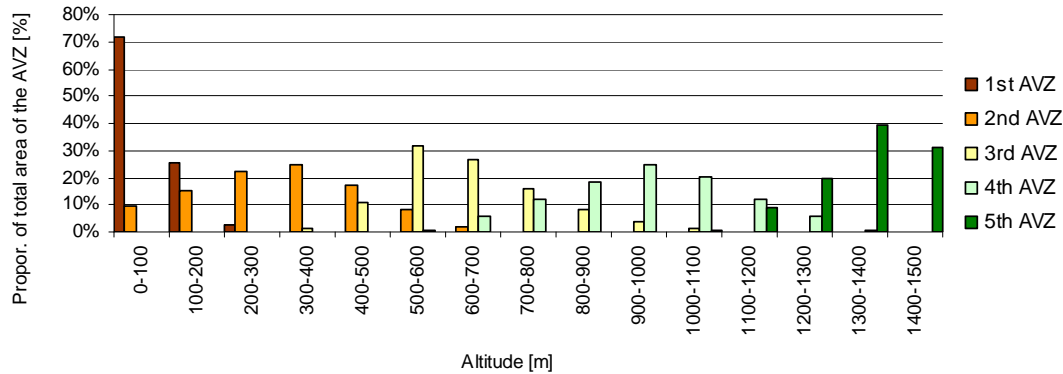
- Použití bezoblačných záznamů NDVI z různých částí roku
- Mapování založené na hodnocení celkové hodnoty NDVI a její proměnlivosti v průběhu roku – aplikace řízené klasifikace obrazu



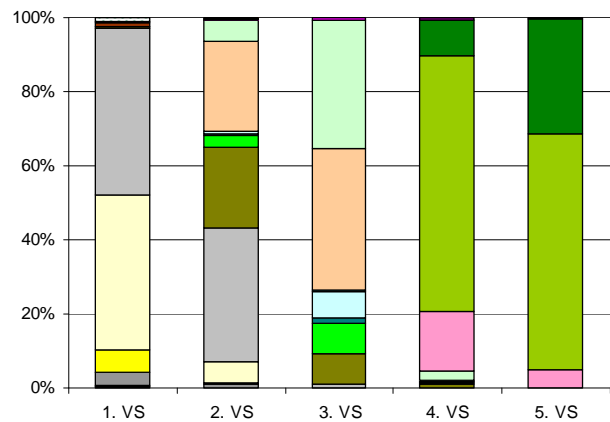
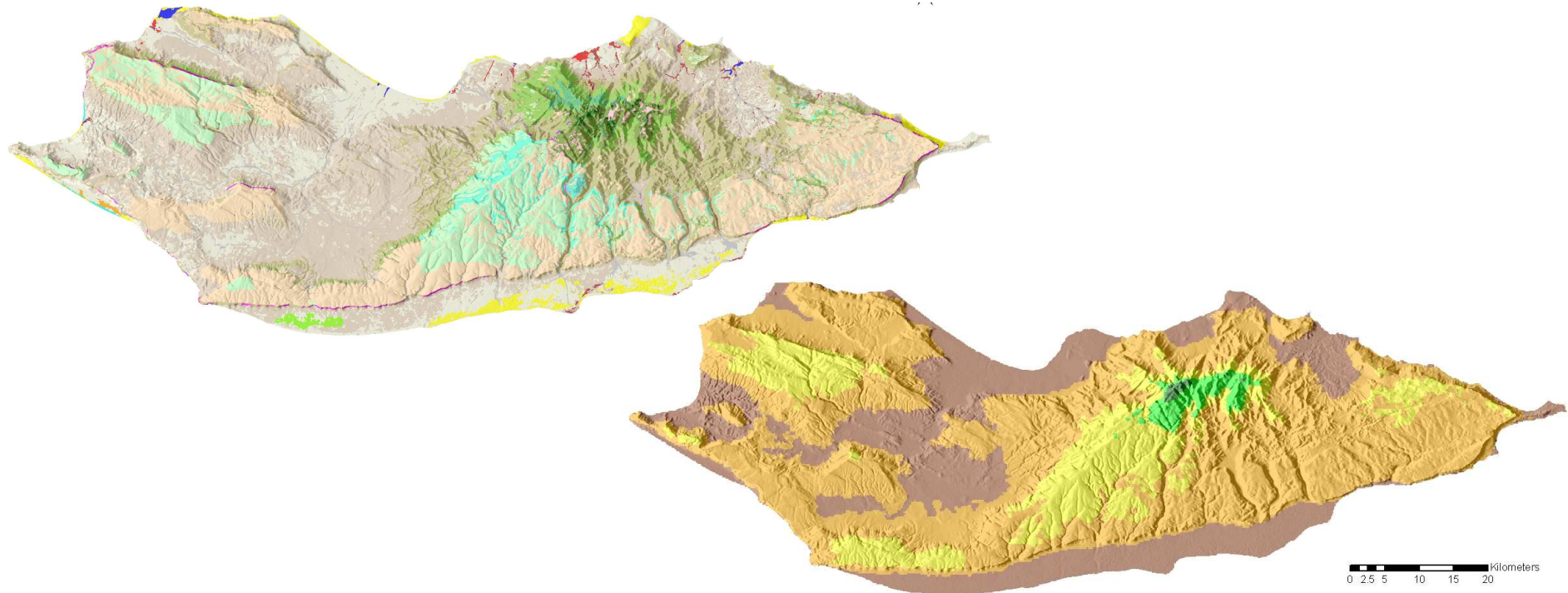
Charakteristiky vegetačních stupňů:



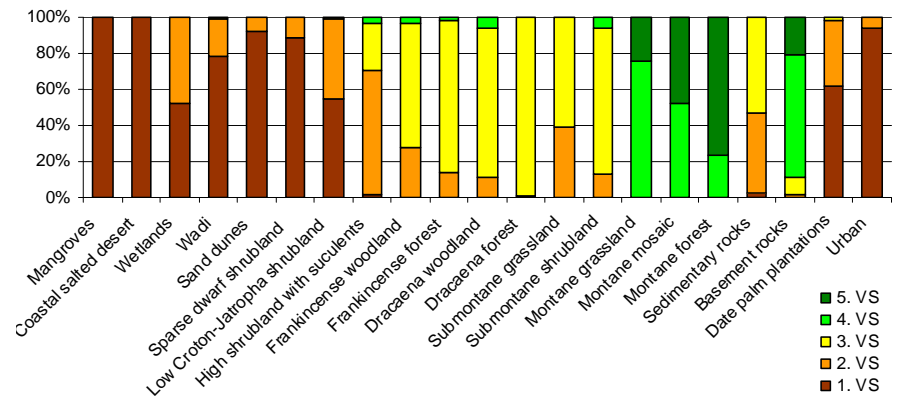
No.	Vegetační stupeň	Průměrná nadmořská výška [m n.m.]	Průměrný sklon [°]
1	planární - <i>meterhel</i>	67	3
2	kolinní - <i>emhar</i>	310	11
3	submontánní - <i>ariob</i>	645	12
4	montánní - <i>dagash</i>	954	22
5	alto-montánní - <i>azabzabahan</i>	1345	23



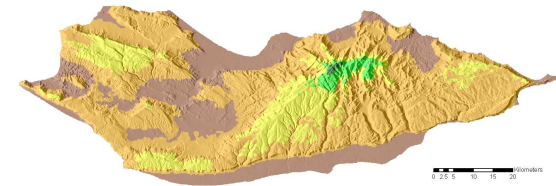
Charakteristiky vegetačních stupňů:



- Sawana woodland
- Urban
- Date palm plantations
- Basement rocks
- Sedimentary rocks
- Montane forest
- Montane mosaic
- Montane grassland
- Submontane shrubland
- Submontane grassland
- Dracaena forest
- Dracaena woodland
- Frankincense forest
- Frankincense woodland
- High shrubland with succulents
- Low Croton-Jatropha shrubland
- Sparse dwarf shrubland
- Sand dunes
- Wadi
- Wetlands
- Coastal salted desert
- Mesquite



- 5. VS
- 4. VS
- 3. VS
- 2. VS
- 1. VS



Závěry – rámcové mapování vegetačních stupňů:

- použití multitemporálních dat satelitu MODIS přineslo překvapivě dobré výsledky (přibližná přesnost mapování VS přes 85%)
- úspěšnost použité metody je do značné míry dána specifickými podmínkami Sokotry:
 - extrémním výškovým a klimatickým gradientem mezi pobřežními planinami na jedné straně a vrcholky pohoří Haggeher na straně druhé
 - relativně přírodním charakterem vegetačního krytu, který není narušován intenzivním zemědělstvím (např. sklizeň by vážně narušovala přirozené sezónní kolísání hodnot NDVI)