Universität Potsdam

Remote Sensing of the Environment

Wintersemester 2024-2025

Lab 8

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Question 1

In Figure 1 and Figure 2 you can see two classified maps of Dubai from 2002 and 2024. The classification of the two maps was quite simple, as I only chose three classes (Water, Urban, Dessert) and there were very good and meaningful areas for each class, which were ideal as training data. The most difficult class was Urban, as I also wanted to classify the islands as Urban in the 2024 data set. However, this also worked well with the 'Activate ROI Pointer' function. As the scatter plot didn't work for me again, I checked my training data with the spectral signature plot and the preview and approved it.

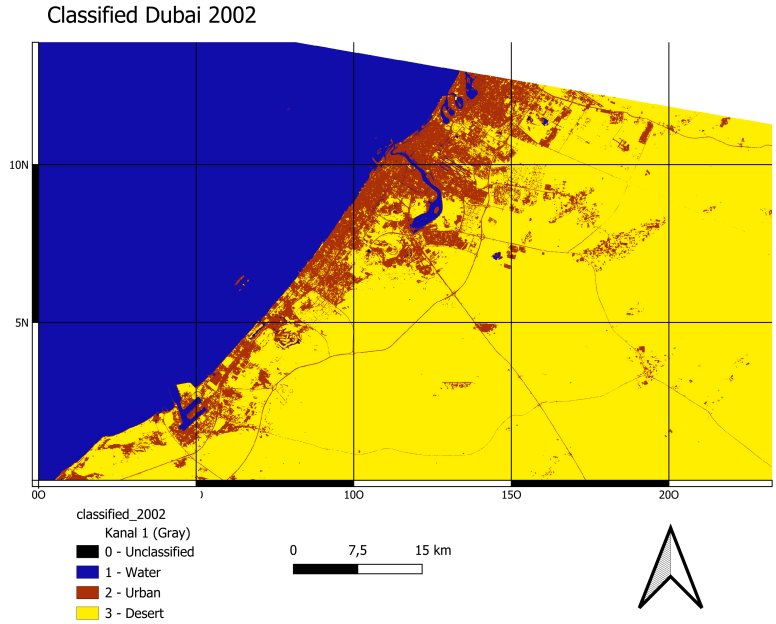

Figure 1

Question 2

In Figure 3 you can see the classified and now sieved map of Dubai from 2002. In Figure 4, Figure 5 and Figure 6 you can also see the three reports of the classifications of Dubai from 2002 and the reports after sieving with threshold 3 and 8. The higher you set the threshold for sieving, the more accurate the result will be, as shown by the Overall Accuracy values of the Accuracy Assessment:

Classified: [%] = 89.0135
Sieved with threshold 3: [%] = 89.0564
Sieved with threshold 8: [%] = 89.1479

However, the differences are not particularly large at 0.1%.

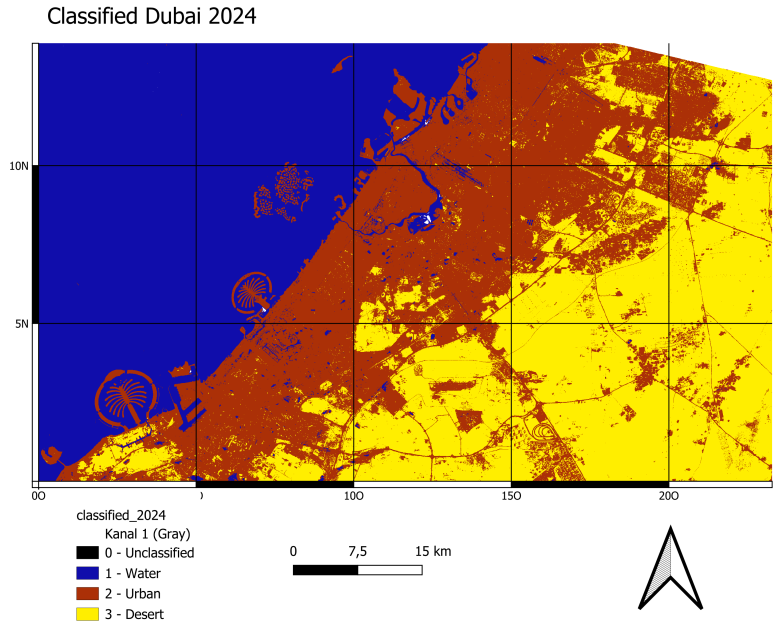

Figure 2

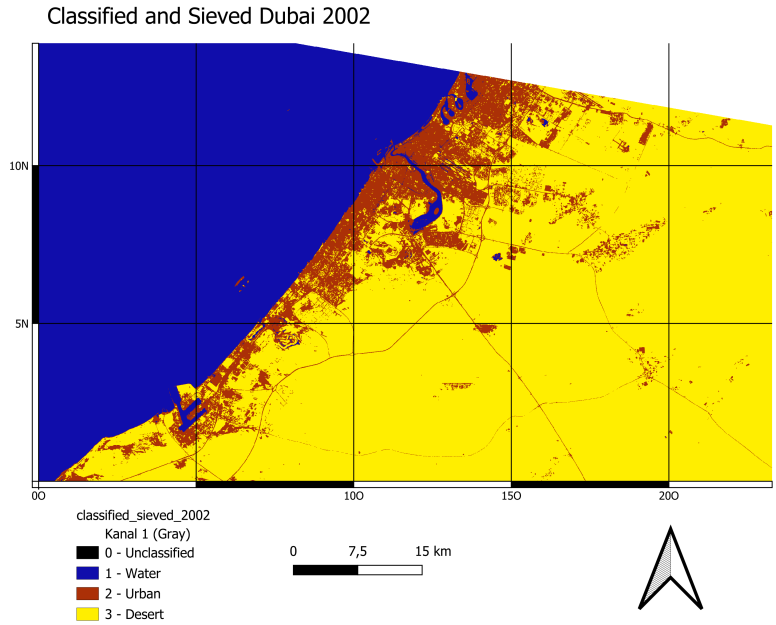

Figure 3

Class	PixelSum	Percentage %	Area [metre^2]
-999	635883	5.5742923838788805	572294700
1	5305989	46.51348451152982	4775390100
2	590432	5.175858767726728	531388800
3	4875117	42.736364336864575	4387605300

Figure 4: classification report

Class	PixelSum	Percentage %	Area [metre^2]
-999	635896	5.57440634478205	572306400
1	5305475	46.50897867274295	4774927500
2	590390	5.175490586347256	531351000
3	4875660	42.74112439612775	4388094000

Figure 5: classification report after sieving with threshold 3

Class	PixelSum	Percentage %	Area [metre^2]
-999	635926	5.574669331481673	572333400
1	5304810	46.50314913423463	4774329000
2	589508	5.16775877737834	530557200
3	4877177	42.754422756905356	4389459300

Figure 6: classification report after sieving with threshold 8

Question 3

In Figure 7 you can see the result report of the land-cover change algorithm which compared the maps of Dubai from 2002, both sieved with threshold 3.

CrossClassCode	NewClass	ReferenceClass	PixelSum	Area [metre^2]
1	-999.0	-999.0	210179.0	189161100.0
2	-999.0	1.0	37428.0	33685200.0
5	1.0	-999.0	139233.0	125309700.0
8	1.0	1.0	5163790.0	4647411000.0
9	1.0	2.0	22570.0	20313000.0
11	1.0	3.0	33167.0	29850300.0
6	2.0	-999.0	169111.0	152199900.0
10	2.0	1.0	103804.0	93423600.0
12	2.0	2.0	555211.0	499689900.0
14	2.0	3.0	1745998.0	1571398200.0
7	3.0	-999.0	117373.0	105635700.0
13	3.0	1.0	453.0	407700.0
15	3.0	2.0	12609.0	11348100.0
16	3.0	3.0	3096495.0	2786845500.0

> LAND COVER CHANGE MATRIX [metre^2]
> NewClass

V_ReferenceClass	-999.0	1.0	2.0	3.0	Total
-999.0	189161100	125309700	152199900	105635700	572306400
1.0	33685200	4647411000	93423600	407700	4774927500
2.0	0	20313000	499689900	11348100	531351000
3.0	0	29850300	1571398200	2786845500	4388094000
Total	222846300	4822884000	2316711600	2904237000	10266678900

Figure 7: land-cover change report

Question 4

In Figure 8 you can see the result of the land-cover change algorithm which compared the maps of Dubai from 2002, both sieved with threshold 3.

Question 5

As expected, there was the biggest change from Desert to Urban (dark orange). The reason for this is the urban expansion and growth of Dubai. The differences are realistic and reasonable.

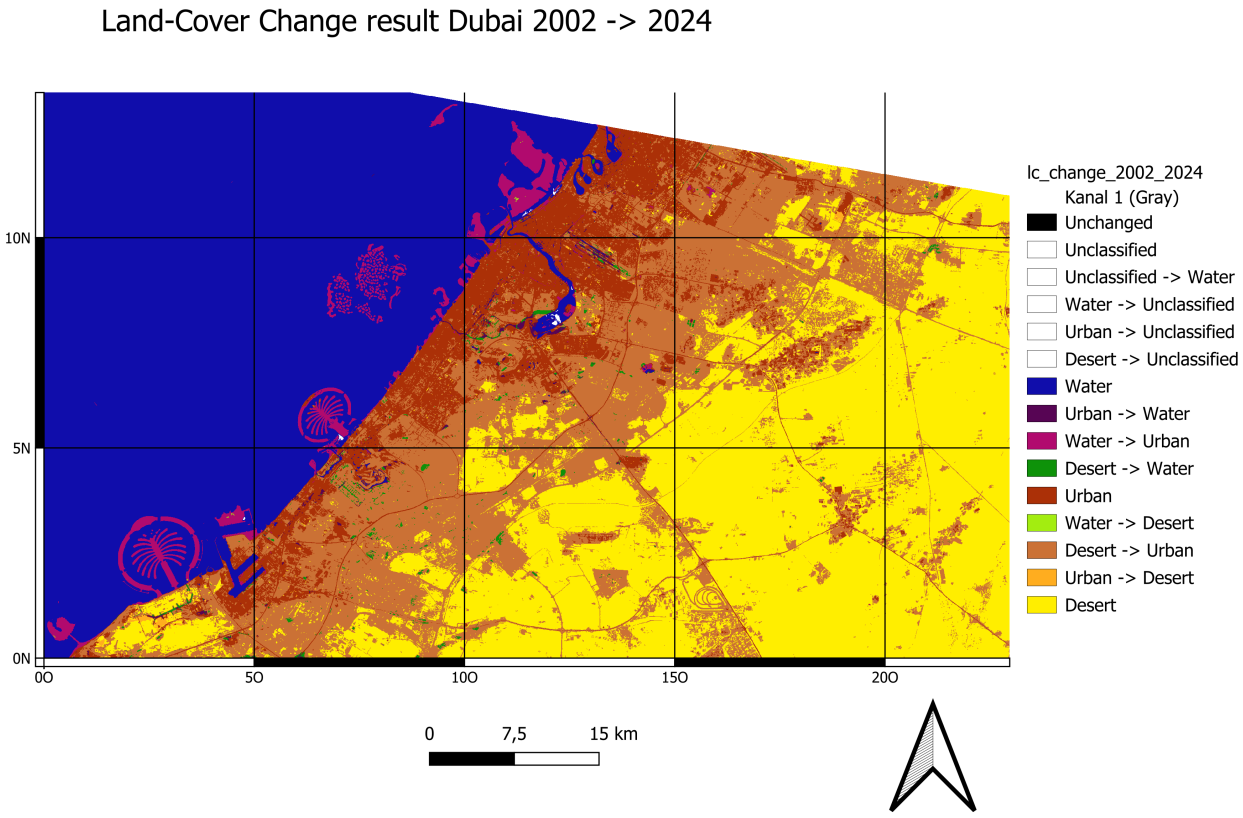
Land-Cover Change result Dubai 2002 -> 2024
10N
5N
0N
0O
5O
10O
15O
20O
0
7,5
15 km
lc_change_2002_2024
Kanal 1 (Gray)
Unchanged
Unclassified
Unclassified -> Water
Water -> Unclassified
Urban -> Unclassified
Desert -> Unclassified
Water
Urban -> Water
Water -> Urban
Desert -> Water
Urban
Water -> Desert
Desert -> Urban
Urban -> Desert
Desert

Figure 8