

**Annex to:**  
**3.3.1 Database of indicators 3.3.2**  
**Monitoring system**

**Monitoring system LP**

Coordinator: PP2 IUAV UNIVERSITY OF VENICE  
Author: LP - IRENA - Istrian Regional Energy Agency

**FINAL Version-Public**  
**June 2019**

<b>ACTION n° 1</b>	<b>TITLE:</b>	<b>WATER HEAT PUMPS - THE ORTHOPEDIC AND REHABILITATION HOSPITAL "PRIM.DR.MARTIN HORVAT"</b>
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RELATED IMPACT THAT THE ACTION MITIGATES				URBAN HEAT ISLAND	
ID Hexagon	LST_mean	Veg_mq	Build_mq	Index UHI-starting point	Index UHI-monitoring point
				#LST	#Veg

## ACTION n° 2 TITLE: WAVES TO ENERGY

RELATED IMPACT THAT THE ACTION MITIGATES					URBAN HEAT ISLAND		RELATED IMPACT THAT THE ACTION MITIGATES					URBAN FLOODING		RELATED IMPACT THAT THE ACTION MITIGATES					SEA LEVEL RISE			
ID	Hexagon	LST_max	Ueq_max	Bund_max			ID	Hexagon	NDBI	NDB			ID	Hexagon	Wq_7m	flood_area_level			ID	Hexagon	SLR_starting point	SLR_enduring point

**ACTION n° 3 TITLE: OVERTOPPING BREAKWATER**

RELATED IMPACT THAT THE ACTION MITIGATES					URBAN HEAT ISLAND		RELATED IMPACT THAT THE ACTION MITIGATES			URBAN FLOODING		RELATED IMPACT THAT THE ACTION MITIGATES					SEA LEVEL RISE	
Q	Reservoir	LST_max	Wqg_m3	Bund_m3	Index UHI - starting point	Index UHI - monitoring point	Q	Reservoir	NDWI	NDWI	Index UHI - starting point	Index UHI - monitoring point	Q	Reservoir	SL - at above sea level	SL - at below sea level	Index SLR - starting point	Index SLR - monitoring point
					PND	PND					PND	PND						PND

<b>ACTION n° 4</b>	<b>TITLE:</b>	<b>SEA KITE</b>
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RELATED IMPACT THAT THE ACTION MITIGATES				URBAN HEAT ISLAND	
ID Hexagon	LST_mean	Veg_mq	Built_mq	Index UHI- starting point	Index UHI- monitoring point

**ACTION n° 5    TITLE:    DEEP GREEN**

RELATED IMPACT THAT THE ACTION MITIGATES				URBAN HEAT ISLAND	
ID Hexagon	LST_mean	Veg_mq	Build_mq	Index UHI-starting point	Index UHI-monitoring point

<b>ACTION n° 6</b>	<b>TITLE:</b>	<b>NATURAL SHADING AND PLANTING</b>
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RELATED IMPACT THAT THE ACTION MITIGATES					URBAN HEAT ISLAND	
ID	Hexagon	LST_mean	Veg_meq	Build_meq	Index UHI-starting point #N/D	Index UHI-monitoring point #N/D
ID	Hexagon	LST_mean	Veg_meq	Build_meq	Index UHI-starting point #N/D	Index UHI-monitoring point #N/D

**ACTION n° 7 TITLE: PROTECTION OF COASTAL INFRASTRUCTURE - ROVINJ**

[illegible]

<b>ACTION n° 8</b>	<b>TITLE:</b>	<b>PROTECTION OF COASTAL INFRASTRUCTURE - VSAR</b>
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RELATED IMPACT THAT THE ACTION MITIGATES				RELATED IMPACT THAT THE ACTION MITIGATES						
URBAN FLOODING				SEA LEVEL RISE						
ID	Hexagon	NDVI	NDWI	Index URB-starting point	Index URB-monitoring point	ID	Hexagon	Wt = 1 m above sea-level	Index URB-starting point	Index URB-monitoring point
				#N/D	#N/D				#N/D	#N/D
ID	Hexagon	NDVI	NDWI	Index URB-starting point	Index URB-monitoring point	ID	Hexagon	Wt = 1 m above sea-level	Index URB-starting point	Index URB-monitoring point
				#N/D	#N/D				#N/D	#N/D

**ACTION n° 9 TITLE: PROTECTION OF COASTAL INFRASTRUCTURE -POREC'**

RELATED IMPACT THAT THE ACTION MITIGATES				URBAN FLOODING		RELATED IMPACT THAT THE ACTION MITIGATES				SEA LEVEL RISE	
ID	Hazardous	NHVI	NDRS	Index UH: starting point	Index UH: monitoring point	ID	Hazardous	Wq: 1 m above sea level	Index UH: starting point	Index UH: monitoring point	
	2915	0.15022	0.239	0.266427	0.43857854		2915	7803	0.17764437	0.00215207	
ID	Hazardous	NHVI	NDRS	Index UH: starting point	Index UH: monitoring point	ID	Hazardous	Wq: 1 m above sea level	Index UH: starting point	Index UH: monitoring point	
	4465	0.15022	0.239	0.59530033	0.43857854		4465	55.64		0.001515	

**Annex to:**  
**3.3.1 Database of indicators 3.3.2**  
**Monitoring system**

**Monitoring system PP1**

Coordinator: PP2 IUAV UNIVERSITY OF VENICE  
Author: PP1 - MUNICIPALITY OF PESARO

**FINAL Version-Public**  
**June 2019**

## WP4 - MONITORING implementation - Municipality of Pesaro

### ACTION n° 1 TITLE: Greening brownfield area/ Nature-based Solutions

RELATED IMPACT THAT THE ACTION MITIGATES				ENERGY DEMAND FOR COOLING	
ID Census area	LST_mean	Vegetated surface	Impermeable surface	Index starting point	Index monitoring point
410440000269				0,405004391	<b>0,226233154</b>

### ACTION n° 2 TITLE: Recovery dune coastal environment of Area Sottomonte

RELATED IMPACT THAT THE ACTION MITIGATES					COASTAL EROSION IN NATURAL AREAS	
ID Transept Area	Floristic areas	Pblic beaches	Dunes	Coastal protection infrastructures	Index starting point	Index monitoring point
110					0,166250038	<b>0,507392185</b>
ID Transept Area	Floristic areas	Pblic beaches	Dunes	Coastal protection infrastructures	Index starting point	Index monitoring point
111					-0,003880991	<b>0,125598912</b>

### ACTION n° 3 TITLE: Implementation of a New school NZEB, with NbS

RELATED IMPACT THAT THE ACTION MITIGATES				ENERGY DEMAND FOR COOLING	
ID Census area	LST_mean	Vegetated surface	Impermeable surface	Index starting point	Index monitoring point
410440000500				0,405542934	<b>0,214546007</b>

### ACTION n° 4 TITLE: Construction of a building complex

RELATED IMPACT THAT THE ACTION MITIGATES				ENERGY DEMAND FOR COOLING	
ID Census area	LST_mean	Vegetated surface	Impermeable surface	Index starting point	Index monitoring point
410440001205				0,280906336	<b>0,04696442</b>
ID Census area	LST_mean	Vegetated surface	Impermeable surface	Index starting point	Index monitoring point
410440001150				0,28907275	<b>0,069333792</b>

### ACTION n° 5 TITLE: Recovering coastal's functions

RELATED IMPACT THAT THE ACTION MITIGATES					COASTAL EROSION IN NATURAL AREAS	
ID Transept Area	Floristic areas	Pblic beaches	Dunes	Coastal protection infrastructures	Index starting point	Index monitoring point
105					0,209175587	<b>0,688739039</b>
ID Transept Area	Floristic areas	Pblic beaches	Dunes	Coastal protection infrastructures	Index starting point	Index monitoring point
106					-0,169614493	<b>0,144129937</b>
ID Transept Area	Floristic areas	Pblic beaches	Dunes	Coastal protection infrastructures	Index starting point	Index monitoring point
107					-0,278459413	<b>0,182712895</b>
ID Transept Area	Floristic areas	Pblic beaches	Dunes	Coastal protection infrastructures	Index starting point	Index monitoring point
108					-0,251052817	<b>0,281334217</b>
ID Transept Area	Floristic areas	Pblic beaches	Dunes	Coastal protection infrastructures	Index starting point	Index monitoring point
109					0,061023748	<b>0,389599366</b>

### ACTION n° 6 TITLE: Greening measures

RELATED IMPACT THAT THE ACTION MITIGATES				ENERGY DEMAND FOR COOLING	
ID Census area	LST_mean	Vegetated surface	Impermeable surface	Index starting point	Index monitoring point
410440000667				0,342482305	<b>0,135591748</b>

**Annex to:**  
**3.3.1 Database of indicators 3.3.2**  
**Monitoring system**

**Monitoring system PP3**

Coordinator: PP2 IUAV UNIVERSITY OF VENICE  
Author: PP3 - MUNICIPALITY OF MISANO  
ADRIATICO

**FINAL Version-Public**  
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WP4 - MONITORING implementation - Municipality of Pesaro

**ACTION n° 1** TITLE: **Reduction of cooling demand in tourist accomadations**

RELATED IMPACT THAT THE ACTION MITIGATES				ENERGY DEMAND FOR COOLING	
ID Census area	LST_mean	Vegetated surface	Impermeable surface	Index starting point	Index monitoring point
990050000008	35,00	700,00	2000,00	0,230872851	<b>0,271178632</b>

**ACTION n° 2** TITLE: **Improve outdoor microclimate of tourist accomadations**

RELATED IMPACT THAT THE ACTION MITIGATES				ENERGY DEMAND FOR COOLING	
ID Census area	LST_mean	Vegetated surface	Impermeable surface	Index starting point	Index monitoring point
990500000001	29,00	1230,00	4560,00	0,86521834	<b>0,809006997</b>

**ACTION n° 8** TITLE: **Urban forest**

RELATED IMPACT THAT THE ACTION MITIGATES				ENERGY DEMAND FOR COOLING	
ID Census area	LST_mean	Vegetated surface	Impermeable surface	Index starting point	Index monitoring point
9900500000021	34,00	70,00	10000,00	0,69297881	<b>0,32940249</b>

**Annex to:**  
**3.3.1 Database of indicators 3.3.2**  
**Monitoring system**

**Monitoring system PP4**

Coordinator: PP2 IUAV UNIVERSITY OF VENICE  
Author: PP4 - CITY OF DUBROVNIK  
DEVELOPMENT AGENCY DURA

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**June 2019**

RELATED IMPACT THAT THE ACTION MITIGATES					URBAN HEAT ISLAND		RELATED IMPACT THAT THE ACTION MITIGATES					URBAN FLOODING	
ID	Hexagon	LST_mean	Veg_mq	Build_mq	Index UHI- starting point	Index UHI- monitoring point	ID	Hexagon	NDVI	NDBI	Index UFI- starting point	Index UFI- monitoring point	
	329				0.22	-1.22		329			-0.56	6.05	

RELATED IMPACT THAT THE ACTION MITIGATES				URBAN FLOODING		RELATED IMPACT THAT THE ACTION MITIGATES				SEA LEVEL RISE	
ID	Hexagon	NDVI	NDBI	Index URS - starting point	Index URS - monitoring point	ID	Hexagon	MIq < 1m above sea-level	Index URS - starting point	Index URS - monitoring point	
451				0.38	0.00	451			0.48	0.46	
ID	Hexagon	NDVI	NDBI	Index URS - starting point	Index URS - monitoring point	ID	Hexagon	MIq < 1m above sea-level	Index URS - starting point	Index URS - monitoring point	
419				-0.57	0.00	419			0.19	0.19	
ID	Hexagon	NDVI	NDBI	Index URS - starting point	Index URS - monitoring point	ID	Hexagon	MIq < 1m above sea-level	Index URS - starting point	Index URS - monitoring point	
418				0.22	0.00	418			0.24	0.24	
ID	Hexagon	NDVI	NDBI	Index URS - starting point	Index URS - monitoring point	ID	Hexagon	MIq < 1m above sea-level	Index URS - starting point	Index URS - monitoring point	
387				-0.19	0.00	387			0.40	0.46	
ID	Hexagon	NDVI	NDBI	Index URS - starting point	Index URS - monitoring point	ID	Hexagon	MIq < 1m above sea-level	Index URS - starting point	Index URS - monitoring point	
355				-0.35	0.00	355			0.12	0.12	
ID	Hexagon	NDVI	NDBI	Index URS - starting point	Index URS - monitoring point	ID	Hexagon	MIq < 1m above sea-level	Index URS - starting point	Index URS - monitoring point	
354				-0.35	0.00	354			0.11	0.01	

RELATED IMPACT THAT THE ACTION MITIGATES				URBAN HEAT ISLAND	
ID Hexagon	LST_mean	Veg_mq	Build_mq	Index UHI- starting point	Index UHI- monitoring point
577				0.23	-1.24

RELATED IMPACT THAT THE ACTION MITIGATES				URBAN HEAT ISLAND	
ID Hexagon	LST_mean	Veg_mq	Buid_mq	Index UHI- starting point	Index UHI- monitoring point
420				0.30	-1.13

RELATED IMPACT THAT THE ACTION MITIGATES				URBAN HEAT ISLAND	
ID Hexagon	LST_mean	Veg_mq	Build_mq	Index UHI- starting point	Index UHI- monitoring point
R09				0.37	-1.12

RELATED IMPACT THAT THE ACTION MITIGATES				URBAN HEAT ISLAND	
ID Hexagon	LST_mean	Veg_mq	Buidl_mq	Index UHI- starting point	Index UHI- monitoring point
641				0.42	-1.05

RELATED IMPACT THAT THE ACTION MITIGATES				URBAN HEAT ISLAND	
ID Hexagon	LST_mean	Veg_mq	Build_mq	Index UHI- starting point	Index UHI- monitoring point
703				0.24	-1.24

RELATED IMPACT THAT THE ACTION MITIGATES				URBAN HEAT ISLAND	
ID Hexagon	LST_mean	Veg_mq	Buidl_mq	Index UHI- starting point	Index UHI- monitoring point
704				0.49	-0.93

RELATED IMPACT THAT THE ACTION MITIGATES					URBAN HEAT ISLAND		RELATED IMPACT THAT THE ACTION MITIGATES			URBAN FLOODING		
ID	Hexagon	LST_max	Veg_mq	Build_mq	Index UHS-starting point	Index UHS-monitoring point	ID	Hexagon	NDVI	NDBI	Index UFS-starting point	Index UFS-monitoring point
672					0.54	-0.97	672				-0.34	0.00
704					0.49	-0.93	704				-0.15	0.00

RELATED IMPACT THAT THE ACTION MITIGATES				URBAN HEAT ISLAND		RELATED IMPACT THAT THE ACTION MITIGATES				URBAN FLOODING	
ID Hexagon	LST_mean	Veg_mq	Build_mq	Index UH6-starting point	Index UH6-monitoring point	ID Hexagon	NDVI	NOBI	Index UF6-starting point	Index UF6-monitoring point	
367				0.23	-1.56	367			-0.64	0.00	

RELATED IMPACT THAT THE ACTION MITIGATES				URBAN HEAT ISLAND		RELATED IMPACT THAT THE ACTION MITIGATES				URBAN FLOODING		
ID	Hazgen	LST_mean	Veg_mq	Build_mq	Index UHs-starting point	Index UHs-monitoring point	ID	Hazgen	NDVI	NDBI	Index UFs-starting point	Index UFs-monitoring point
	704				0.45	-0.93		704			-0.15	0.00

RELATED IMPACT THAT THE ACTION MITIGATES			URBAN FLOODING		RELATED IMPACT THAT THE ACTION MITIGATES			SEA LEVEL RISE			
ID	Hexagon	NDVI	NDBI	Index UHS - starting point	Index UHS - monitoring point	ID	Hexagon	Wq < 1m above sea-level		Index UHS - starting point	Index UHS - monitoring point
	354			-0.35	0.00		354			0.01	0.01
ID	Hexagon	NDVI	NDBI	Index UHS - starting point	Index UHS - monitoring point	ID	Hexagon	Wq < 1m above sea-level		Index UHS - starting point	Index UHS - monitoring point
	385			-0.11	0.00		385			0.14	0.14



**Annex to:**  
**3.3.1 Database of indicators 3.3.2**  
**Monitoring system**

**Monitoring system PP5**

Coordinator: PP2 IUAV UNIVERSITY OF VENICE  
Author: PP5 - REGIONAL NATURAL PARK  
“COASTAL DUNES FROM TORRE CANNE TO  
TORRE SAN LEONARDO”

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**June 2019**

## WP4 - MONITORING implementation - Parco DUNE COSTIERE

### ACTION n° 3 Restoration and Management of Biodiversity in the Park

RELATED IMPACT THAT THE ACTION		COASTAL EROSION	
ID Transept Area	Built_Up Areas	Index starting point	Index monitoring point
3		0,002269572	0,002269572
ID Transept Area	Built_Up Areas	Index starting point	Index monitoring point
4		0,005610411	0,005610411
ID Transept Area	Built_Up Areas	Index starting point	Index monitoring point
5		7,86105E-05	7,86105E-05
ID Transept Area	Built_Up Areas	Index starting point	Index monitoring point
6		0,000121697	0,000121697
ID Transept Area	Built_Up Areas	Index starting point	Index monitoring point
28		0,000591621	0,000591621
ID Transept Area	Built_Up Areas	Index starting point	Index monitoring point
29		0,024406696	0,024406696
ID Transept Area	Built_Up Areas	Index starting point	Index monitoring point
30		0,049198558	0,049198558
ID Transept Area	Built_Up Areas	Index starting point	Index monitoring point
31		0,120008743	0,120008743
ID Transept Area	Built_Up Areas	Index starting point	Index monitoring point
33		0,098693015	0,098693015
ID Transept Area	Built_Up Areas	Index starting point	Index monitoring point
34		0	0
ID Transept Area	Built_Up Areas	Index starting point	Index monitoring point
35		0	0
ID Transept Area	Built_Up Areas	Index starting point	Index monitoring point
36		0	0

### ACTION n° 6 Restoration and Management of Biodiversity in the Park

RELATED IMPACT THAT THE ACTION		COASTAL EROSION	
ID Transept Area	Built_Up Areas	Index starting point	Index monitoring point
3		0,002269572	0,002269572
ID Transept Area	Built_Up Areas	Index starting point	Index monitoring point
4		0,005610411	0,005610411
ID Transept Area	Built_Up Areas	Index starting point	Index monitoring point
5		7,86105E-05	7,86105E-05
ID Transept Area	Built_Up Areas	Index starting point	Index monitoring point
6		0,000121697	0,000121697
ID Transept Area	Built_Up Areas	Index starting point	Index monitoring point
7	0,00	0,002955513	0,002955513
ID Transept Area	Built_Up Areas	Index starting point	Index monitoring point
8	0,00	0,024839988	0,024839988
ID Transept Area	Built_Up Areas	Index starting point	Index monitoring point

9	0,00
ID Transept Area	Built_Up Areas
10	0,00
ID Transept Area	Built_Up Areas
11	0,00
ID Transept Area	Built_Up Areas
12	0,00
ID Transept Area	Built_Up Areas
13	0,00
ID Transept Area	Built_Up Areas
14	0,00
ID Transept Area	Built_Up Areas
15	0,00
ID Transept Area	Built_Up Areas
16	0,00
ID Transept Area	Built_Up Areas
17	0,00
ID Transept Area	Built_Up Areas
18	0,00
ID Transept Area	Built_Up Areas
19	0,00
ID Transept Area	Built_Up Areas
20	0,00
ID Transept Area	Built_Up Areas
21	0,00
ID Transept Area	Built_Up Areas
22	0,00
ID Transept Area	Built_Up Areas
23	0,00
ID Transept Area	Built_Up Areas
24	0,00
ID Transept Area	Built_Up Areas
25	0,00
ID Transept Area	Built_Up Areas
26	0,00
ID Transept Area	Built_Up Areas
27	0,00
ID Transept Area	Built_Up Areas
28	0,00
ID Transept Area	Built_Up Areas
29	0,00
ID Transept Area	Built_Up Areas
30	0,00
ID Transept Area	Built_Up Areas
31	0,00
ID Transept Area	Built_Up Areas
33	0,00
ID Transept Area	Built_Up Areas

0,022406134	0,022406134
Index starting point	Index monitoring point
0,073511728	0,073511728
Index starting point	Index monitoring point
0,023145523	0,023145523
Index starting point	Index monitoring point
0,00901919	0,00901919
Index starting point	Index monitoring point
0,010547937	0,010547937
Index starting point	Index monitoring point
0,018973926	0,018973926
Index starting point	Index monitoring point
0,042275511	0,042275511
Index starting point	Index monitoring point
0,014224143	0,014224143
Index starting point	Index monitoring point
0,159972949	0,159972949
Index starting point	Index monitoring point
0,127561531	0,127561531
Index starting point	Index monitoring point
0,052349474	0,052349474
Index starting point	Index monitoring point
0,378585387	0,378585387
Index starting point	Index monitoring point
0,114081572	0,114081572
Index starting point	Index monitoring point
0,702938013	0,702938013
Index starting point	Index monitoring point
0,492650694	0,492650694
Index starting point	Index monitoring point
0,79858349	0,79858349
Index starting point	Index monitoring point
0,091811598	0,091811598
Index starting point	Index monitoring point
0,010095929	0,010095929
Index starting point	Index monitoring point
0,081364544	0,081364544
Index starting point	Index monitoring point
0,000591621	0,000591621
Index starting point	Index monitoring point
0,024406696	0,024406696
Index starting point	Index monitoring point
0,049198558	0,049198558
Index starting point	Index monitoring point
0,120008743	0,120008743
Index starting point	Index monitoring point
0,098693015	0,098693015
Index starting point	Index monitoring point

34	0,00
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ID Transept Area	Built_Up Areas
35	0,00

ID Transept Area	Built_Up Areas
36	0,00

0	0
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Index starting point	Index monitoring point
0	0

Index starting point	Index monitoring point
0	0

## ACTION n° 7

## Recovery of coastal dunes

RELATED IMPACT THAT THE ACTION	COASTAL EROSION
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ID Transept Area	Built_Up Areas
6	56,00

ID Transept Area	Built_Up Areas
7	1000,00

ID Transept Area	Built_Up Areas
8	600,00

ID Transept Area	Built_Up Areas
9	789,00

ID Transept Area	Built_Up Areas
10	100,00

ID Transept Area	Built_Up Areas
11	200,00

ID Transept Area	Built_Up Areas
12	0,00

ID Transept Area	Built_Up Areas
13	1111,00

ID Transept Area	Built_Up Areas
17	2222,00

ID Transept Area	Built_Up Areas
18	9090,00

ID Transept Area	Built_Up Areas
19	2000,00

ID Transept Area	Built_Up Areas
20	0,00

ID Transept Area	Built_Up Areas
21	0,00

ID Transept Area	Built_Up Areas
22	1111,00

ID Transept Area	Built_Up Areas
23	2222,00

ID Transept Area	Built_Up Areas
24	9090,00

ID Transept Area	Built_Up Areas
25	2000,00

ID Transept Area	Built_Up Areas
26	0,00

ID Transept Area	Built_Up Areas
33	2000,00

ID Transept Area	Built_Up Areas
36	0,00

Index starting point	Index monitoring point
0,000121697	0,000371103

Index starting point	Index monitoring point
0,002955513	0,00699032

Index starting point	Index monitoring point
0,024839988	0,029943425

Index starting point	Index monitoring point
0,022406134	0,028224937

Index starting point	Index monitoring point
0,073511728	0,073511728

Index starting point	Index monitoring point
0,023145523	0,024119992

Index starting point	Index monitoring point
0,00901919	0,00901919

Index starting point	Index monitoring point
0,010547937	0,015025358

Index starting point	Index monitoring point
0,159972949	0,297731291

Index starting point	Index monitoring point
0,127561531	0,562475433

Index starting point	Index monitoring point
0,052349474	0,070479878

Index starting point	Index monitoring point
0,378585387	0,37760869

Index starting point	Index monitoring point
0,114081572	0,113973784

Index starting point	Index monitoring point
0,702938013	0,762745862

Index starting point	Index monitoring point
0,492650694	0,576307224

Index starting point	Index monitoring point
0,79858349	1,327464977

Index starting point	Index monitoring point
0,091811598	0,103818445

Index starting point	Index monitoring point
0,010095929	0,010095929

Index starting point	Index monitoring point
0,098693015	0,098865746

Index starting point	Index monitoring point
0	0