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University of Marine Science and Technology

(東京海洋大学)

沿岸域の高潮・洪水同時浸水災害における避難対策
と避難所の再配置に関する研究

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2020

2021 3

2020

2021 3

1		1
1 1		1
2		5
2 1 iRIC Nays2DFlood		5
2 2		6
2 3		10
3		61
3 1		61
3 2		64
3 3		66
3 4		73
4		75
4 1		75
4 2		80
5		89
		91
		93

1

1 1

2019 19 2018

12

1

2018

9 5 2018 7

3

17

4.6% 1% 7

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3

4 5 6

K19

K19

K19

7

51%

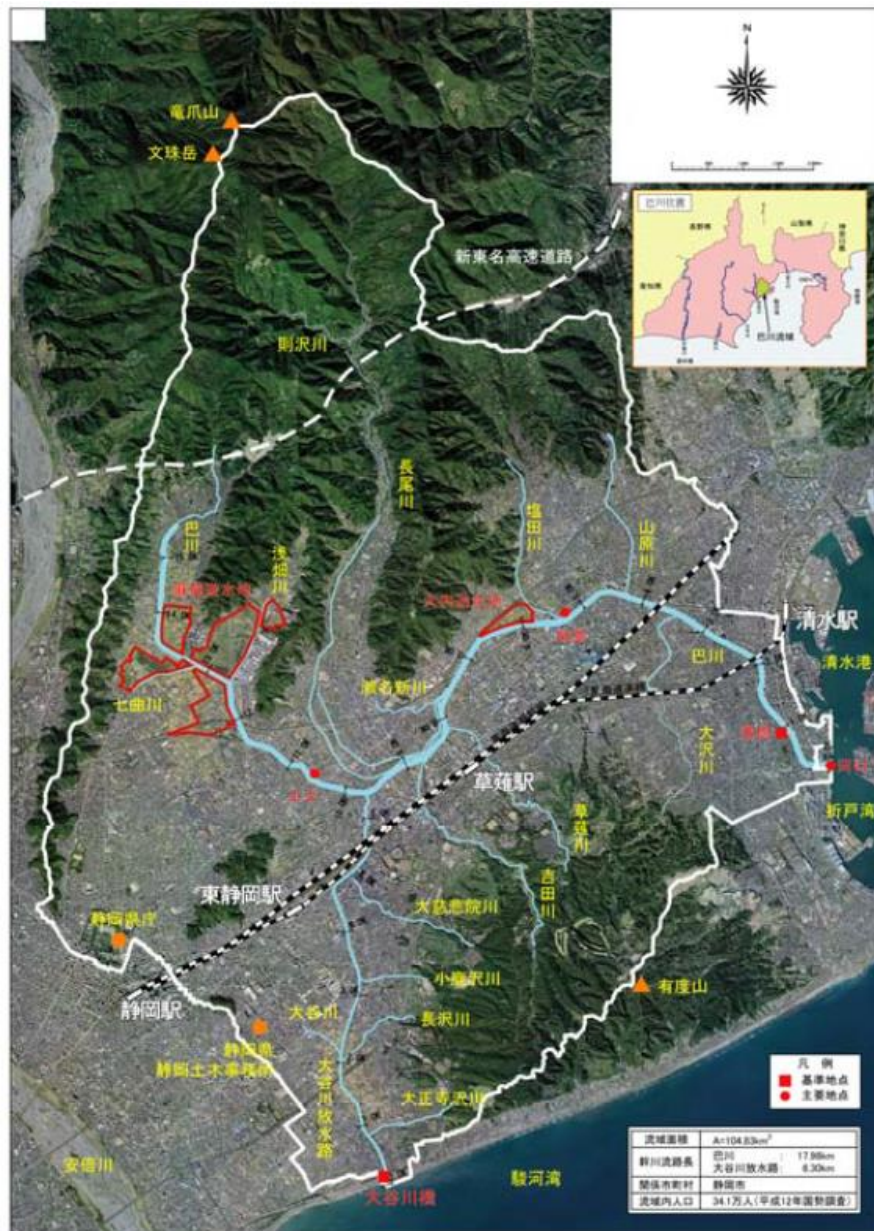
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8

53

16

58



1.1

30

49 7 7 7 9

8 9 24 508mm 12,000

14,000 15 16

10

2019 19

12

1.3 12

3 13

2

2 1 iRIC Nays2DFlood

iRIC

Nays2DFlood

solver

iRIC International River Interface Cooperative 2007

Jon Nelson USGS

iRIC

¹⁴ Nays2d Flood

Nays2D



2.1

iRIC Nays2DFlood

2.1

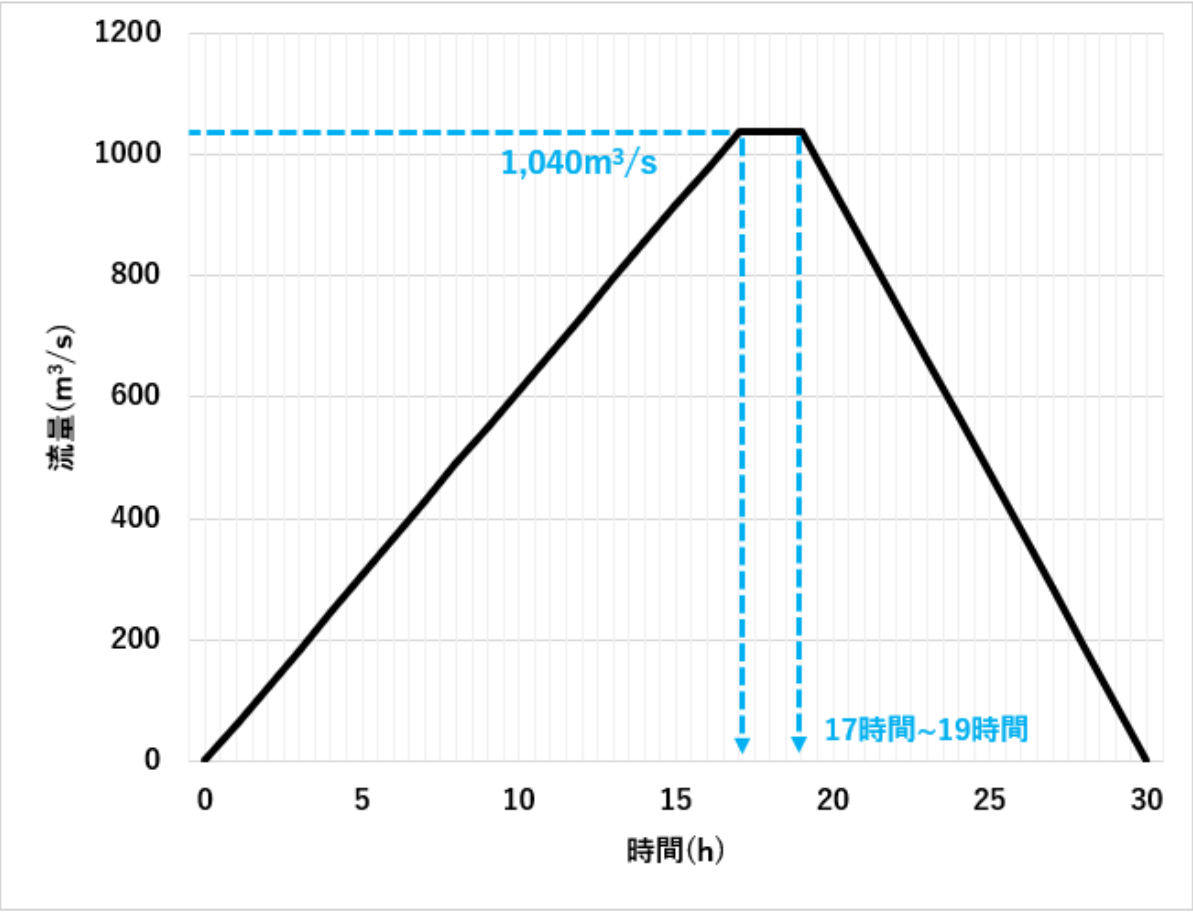
6.5m

10m

GSI elevation tiles DEM 10B

30





2.2

20 9

16

50

1

2.2

1,040 m^3/s

0

0 m^3/s

17

19

2

1,040 m^3/s

2019

19

T.P.1.63m

2.3 A

17

2019

10

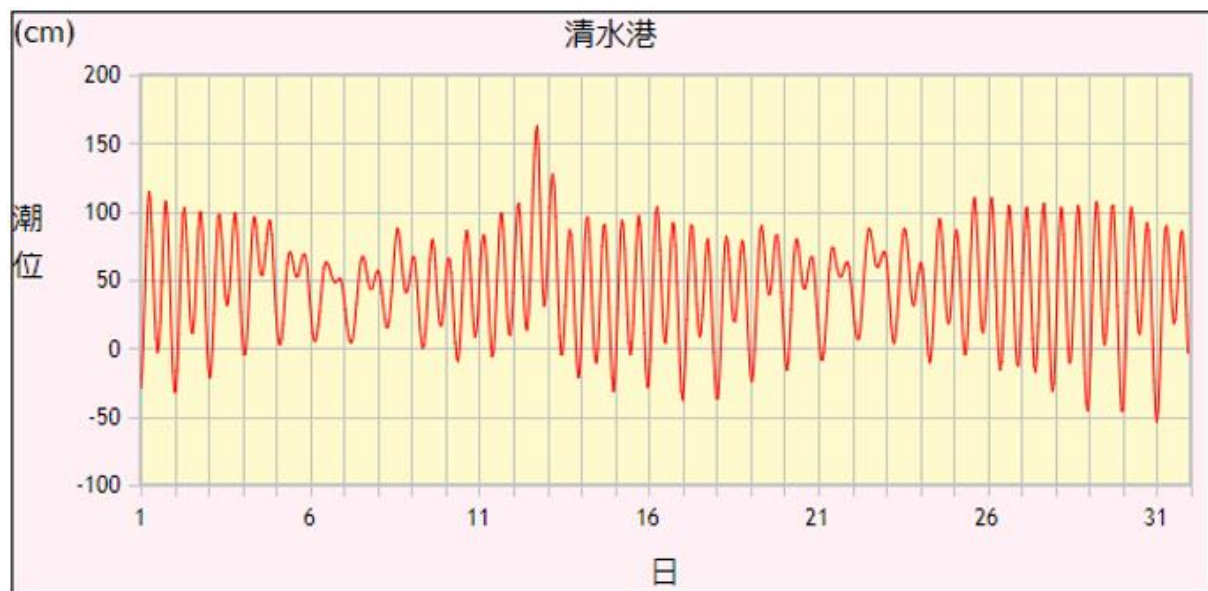
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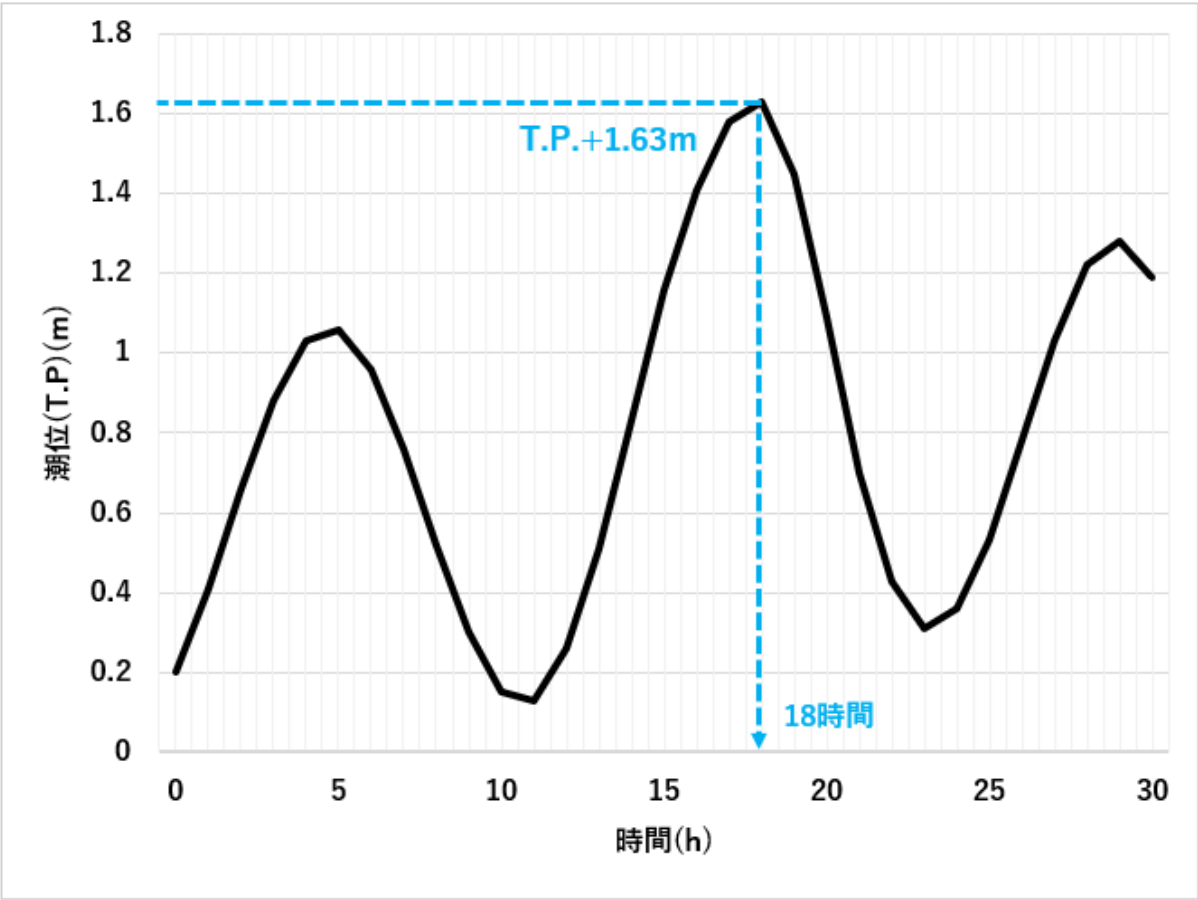
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2.3 B



2.3 A 2019 10 :



2.3 B 2019 10 12 :

2 3

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m³/s 2.4

2.5 A 2.5 e

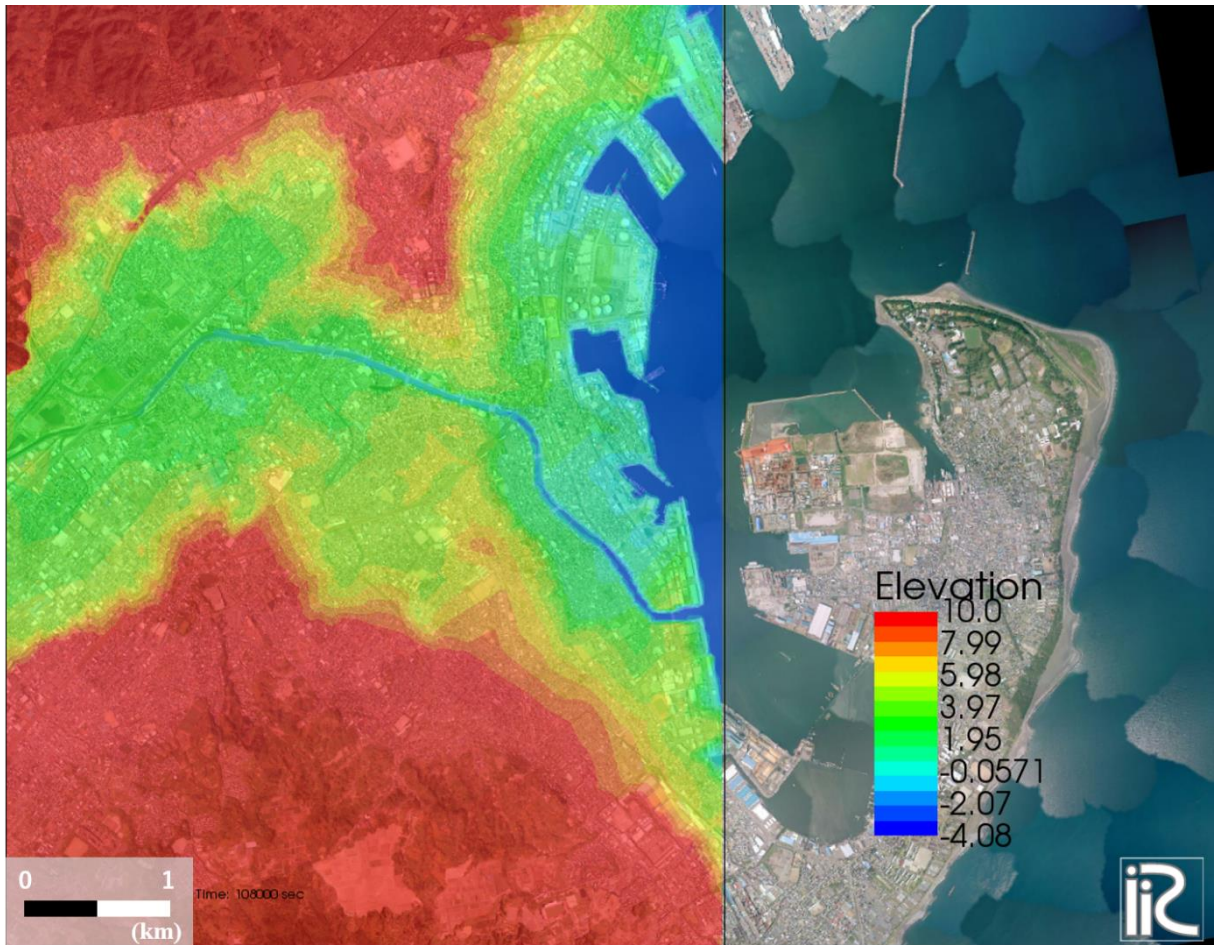
2.6 A 2.6 e

2.7 A 2.7 e

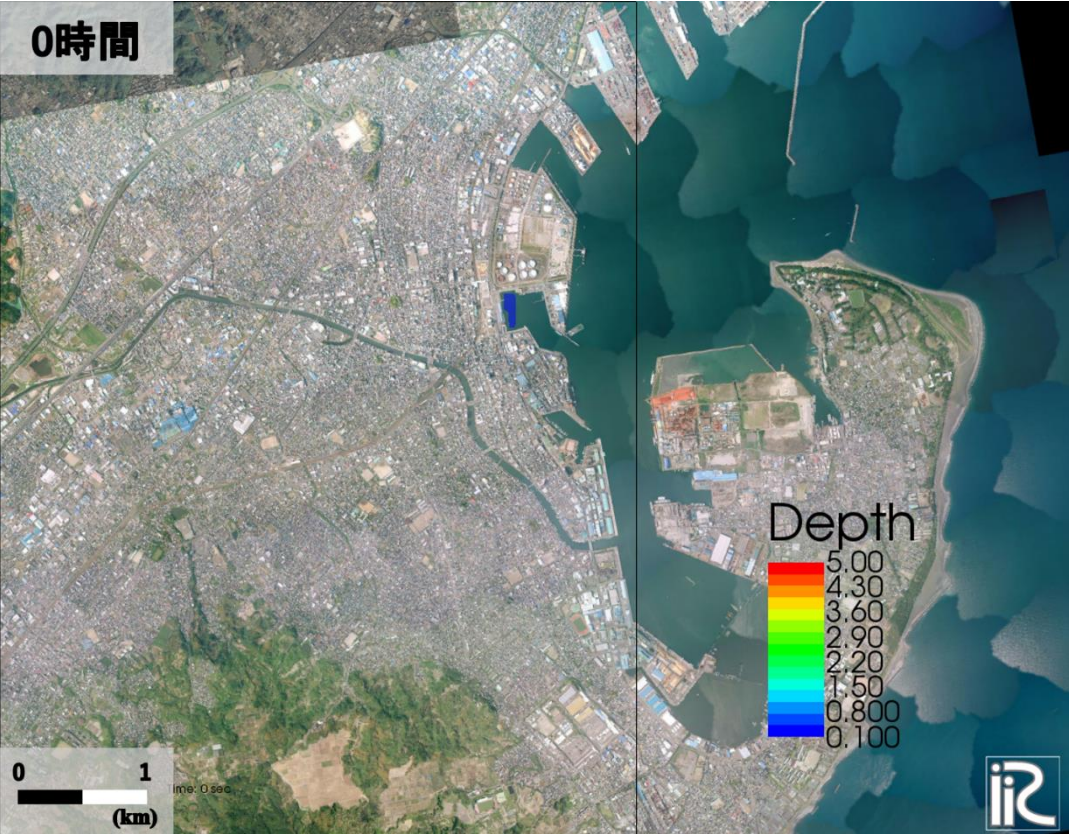
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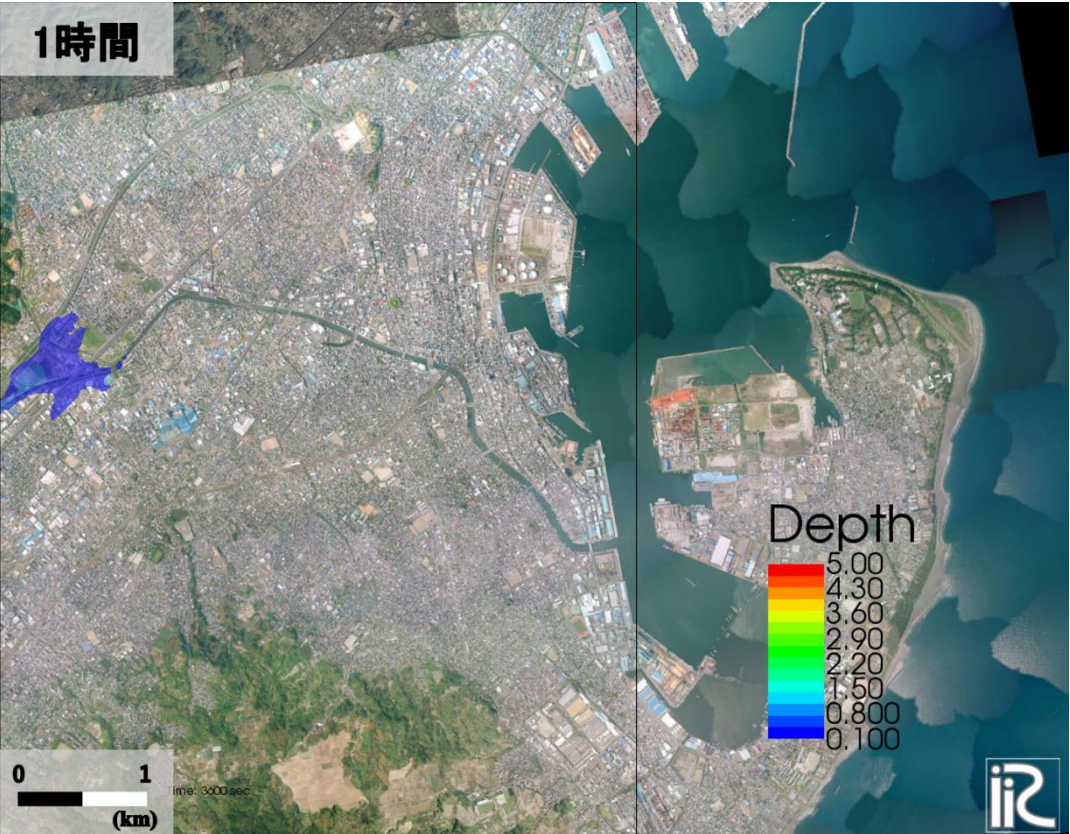


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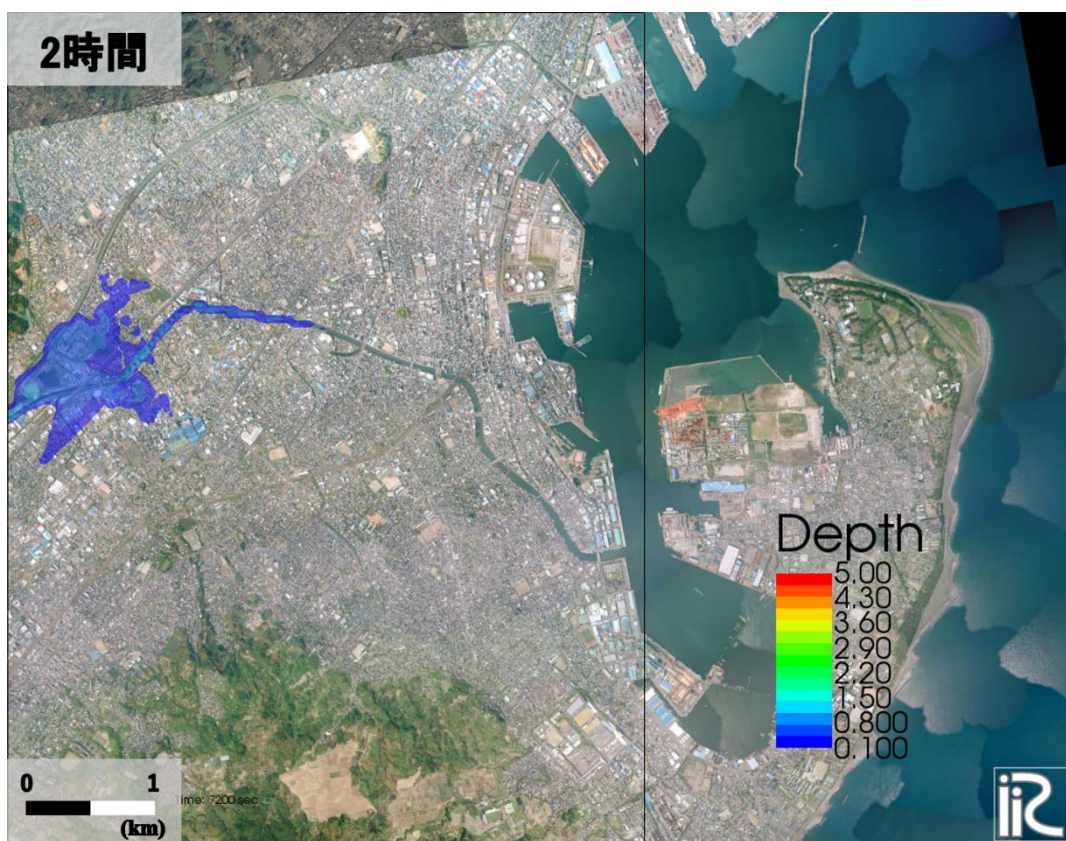
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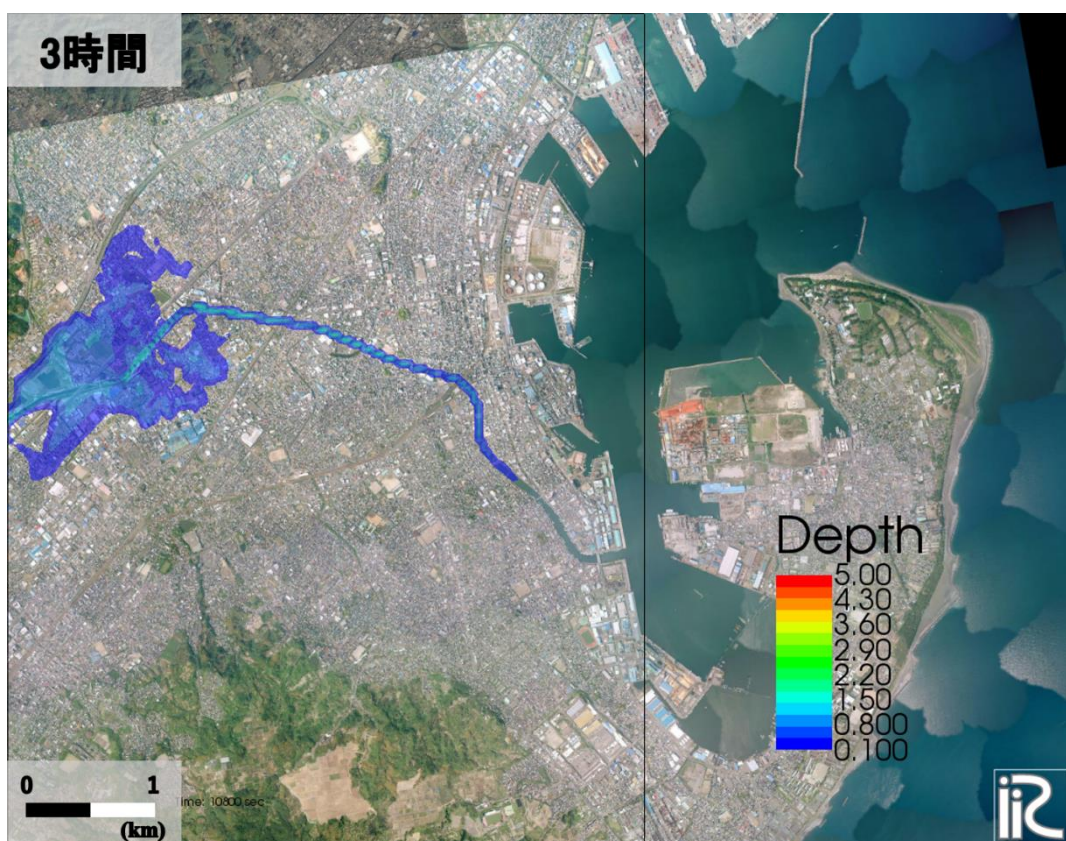
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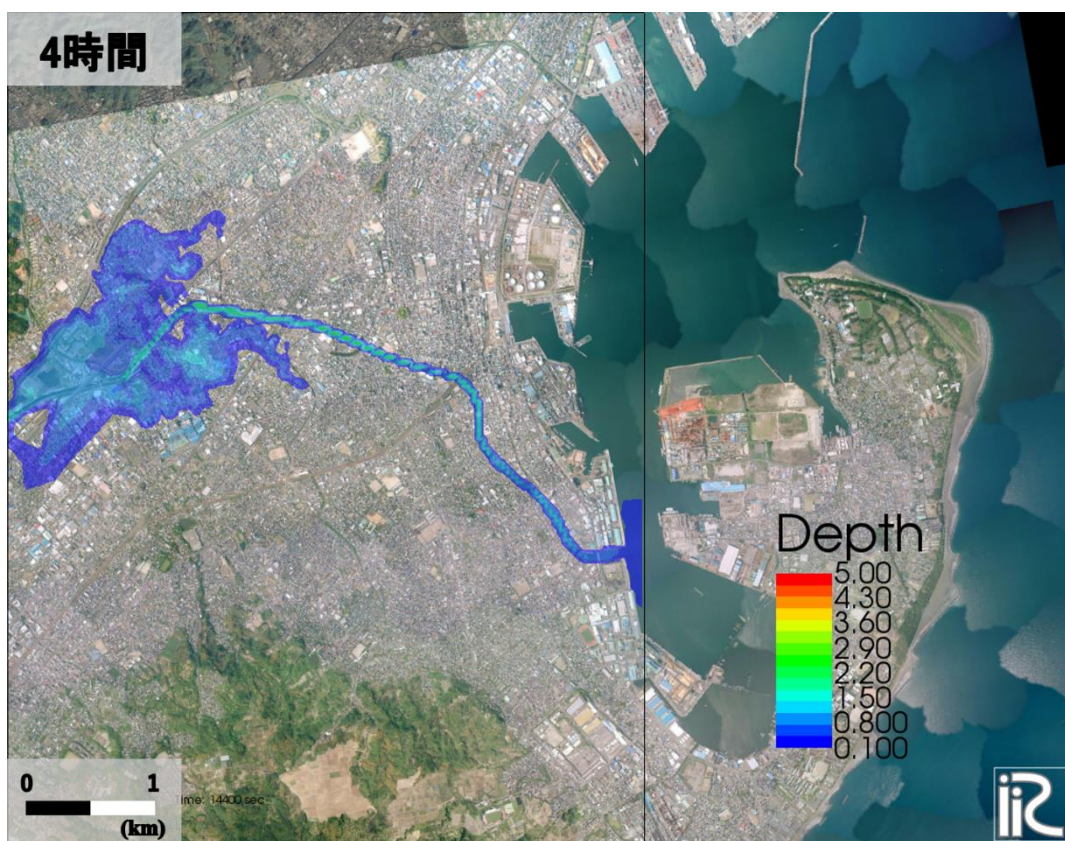


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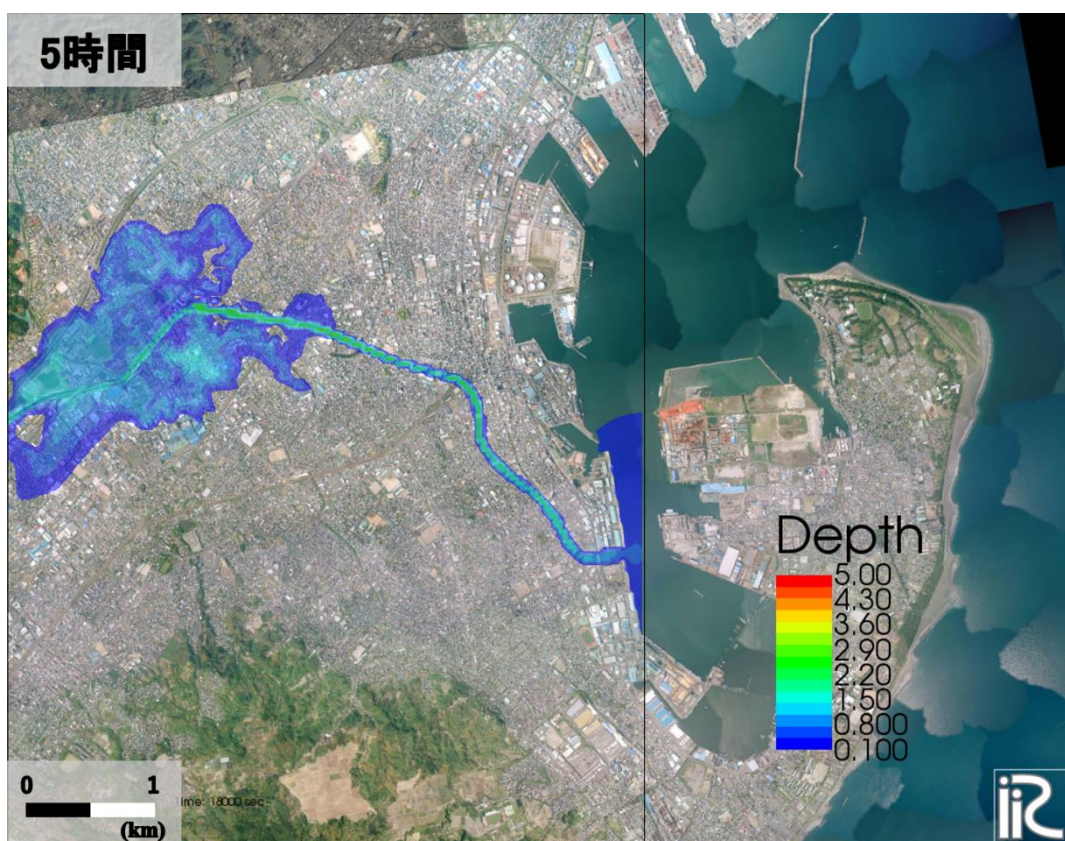
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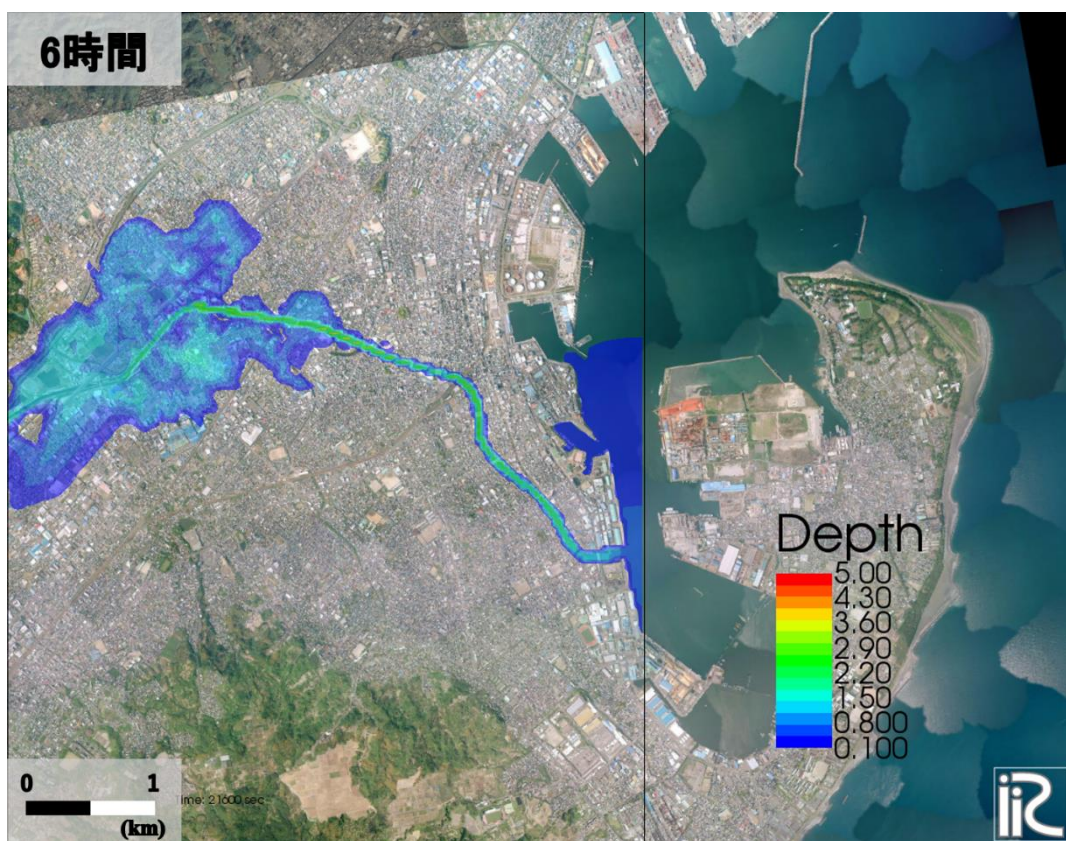
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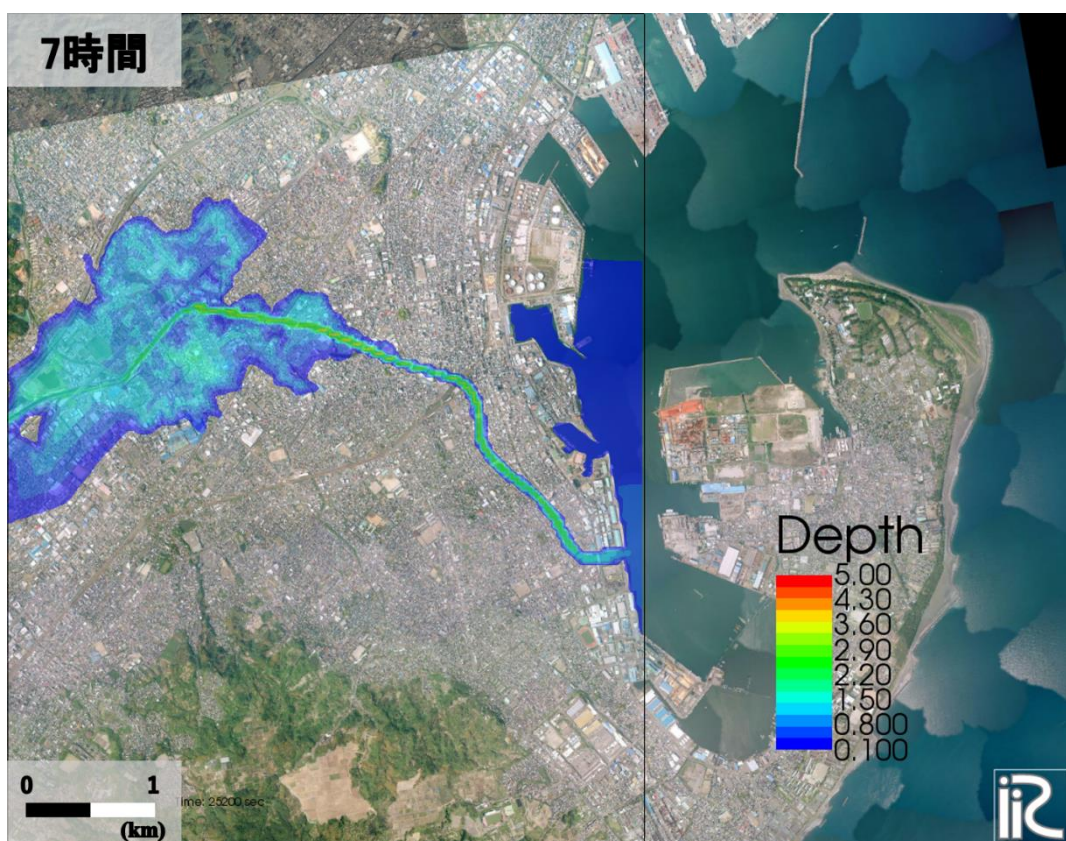
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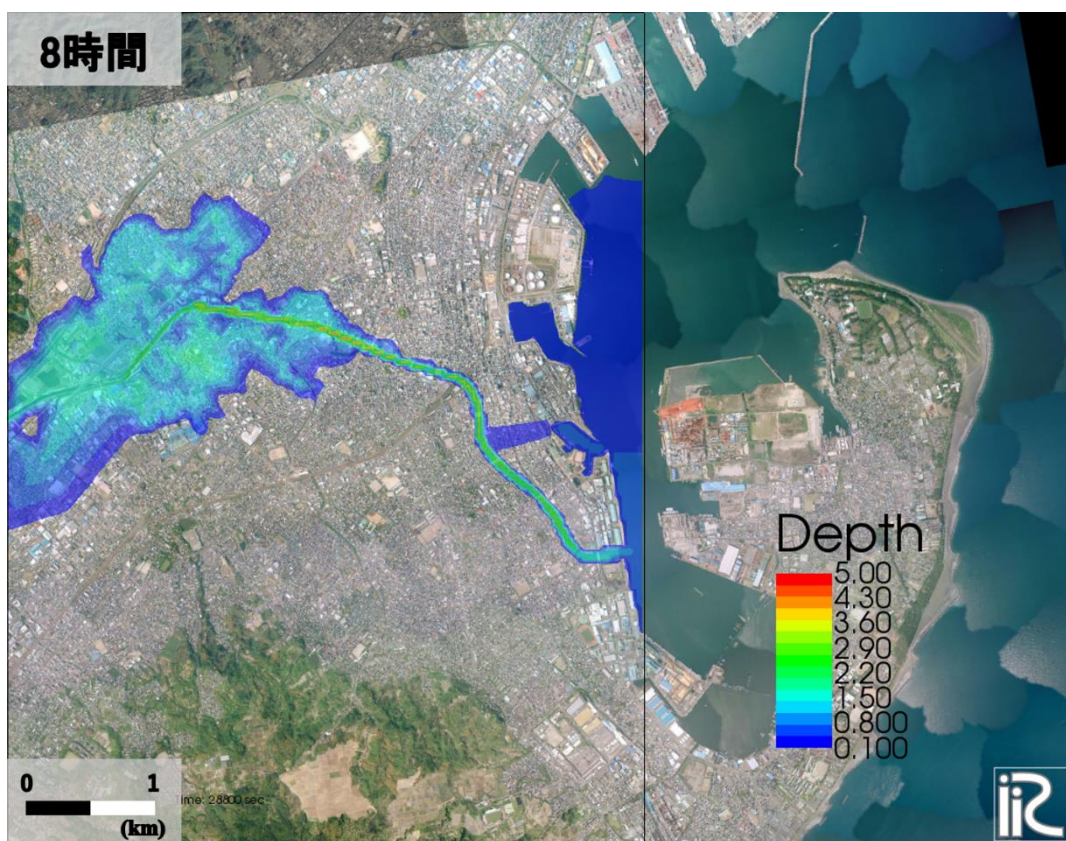
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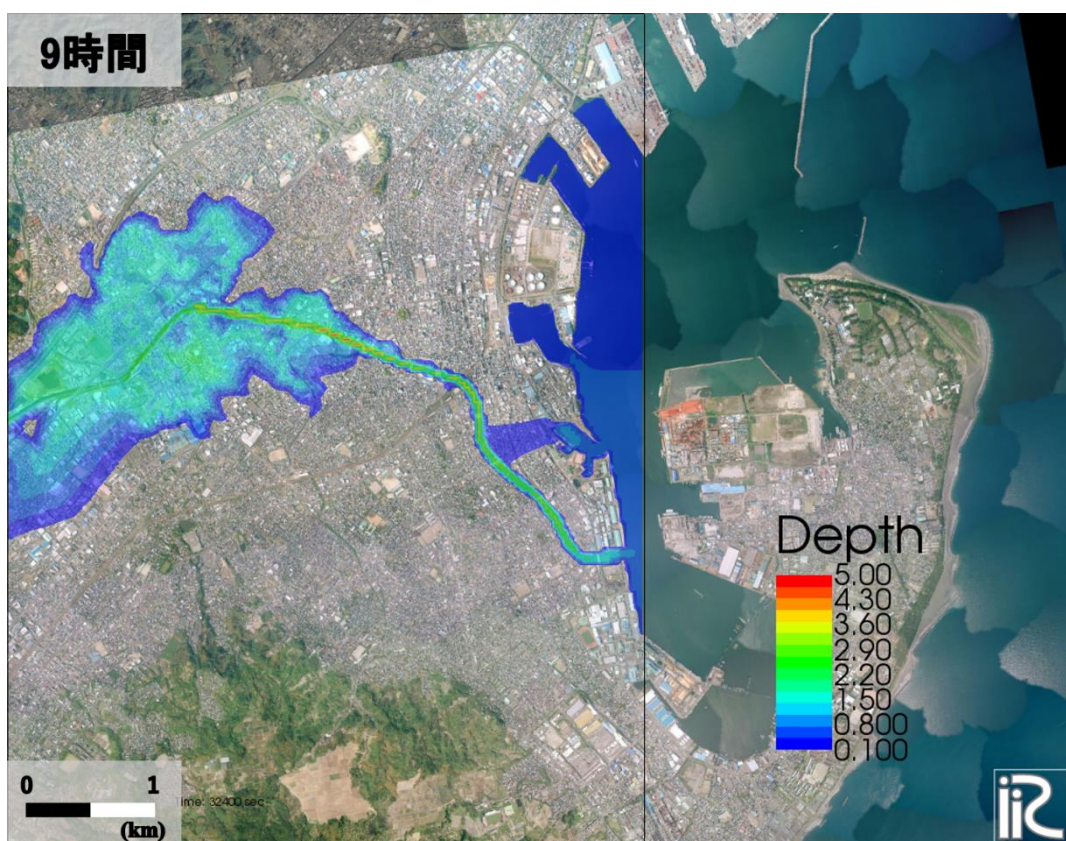
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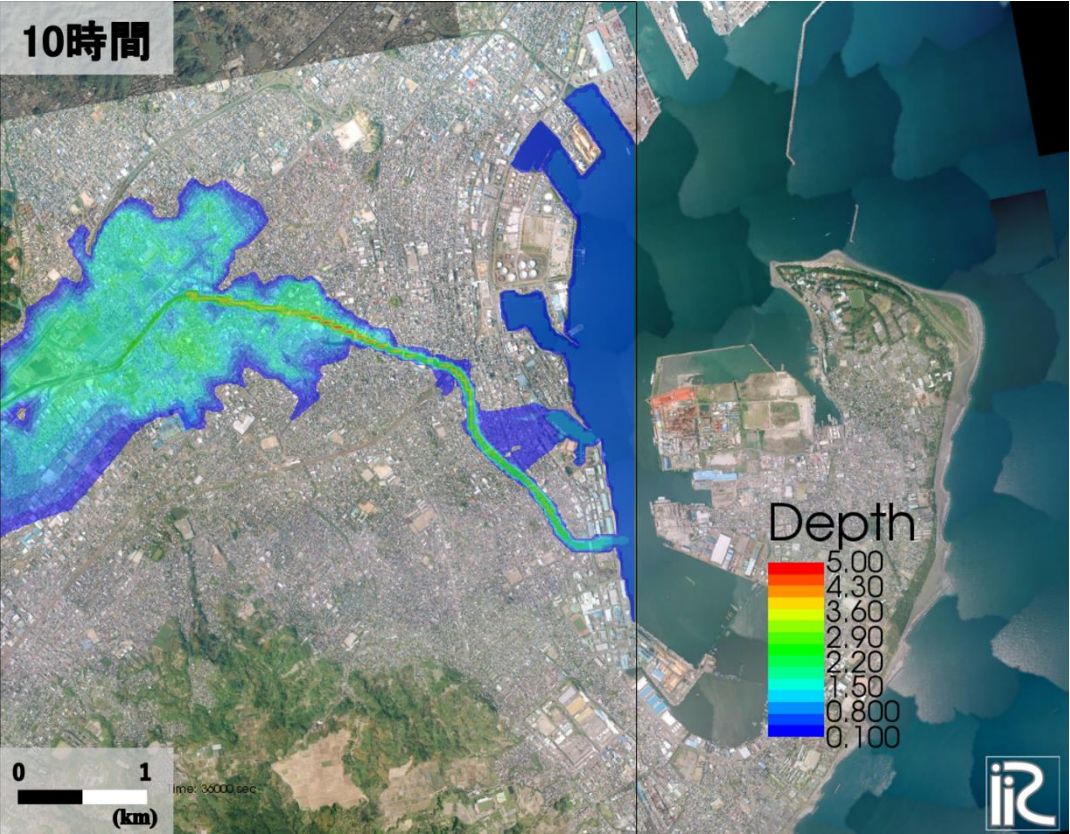
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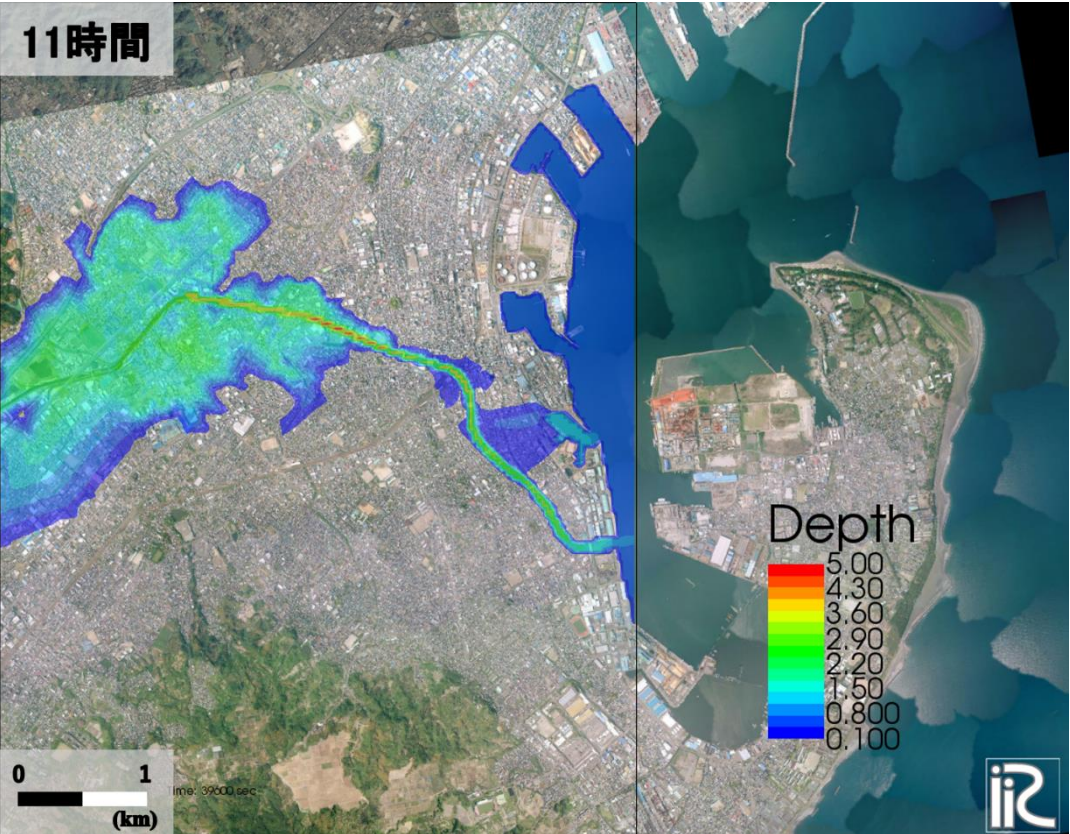


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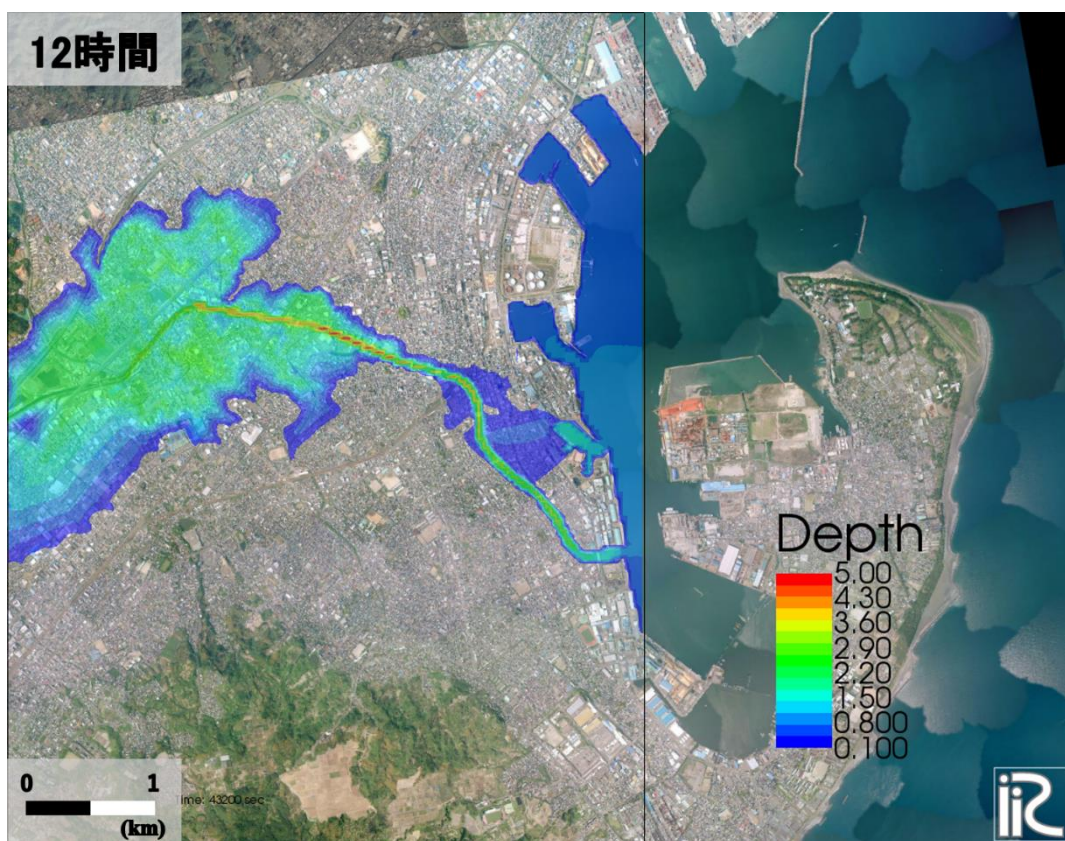
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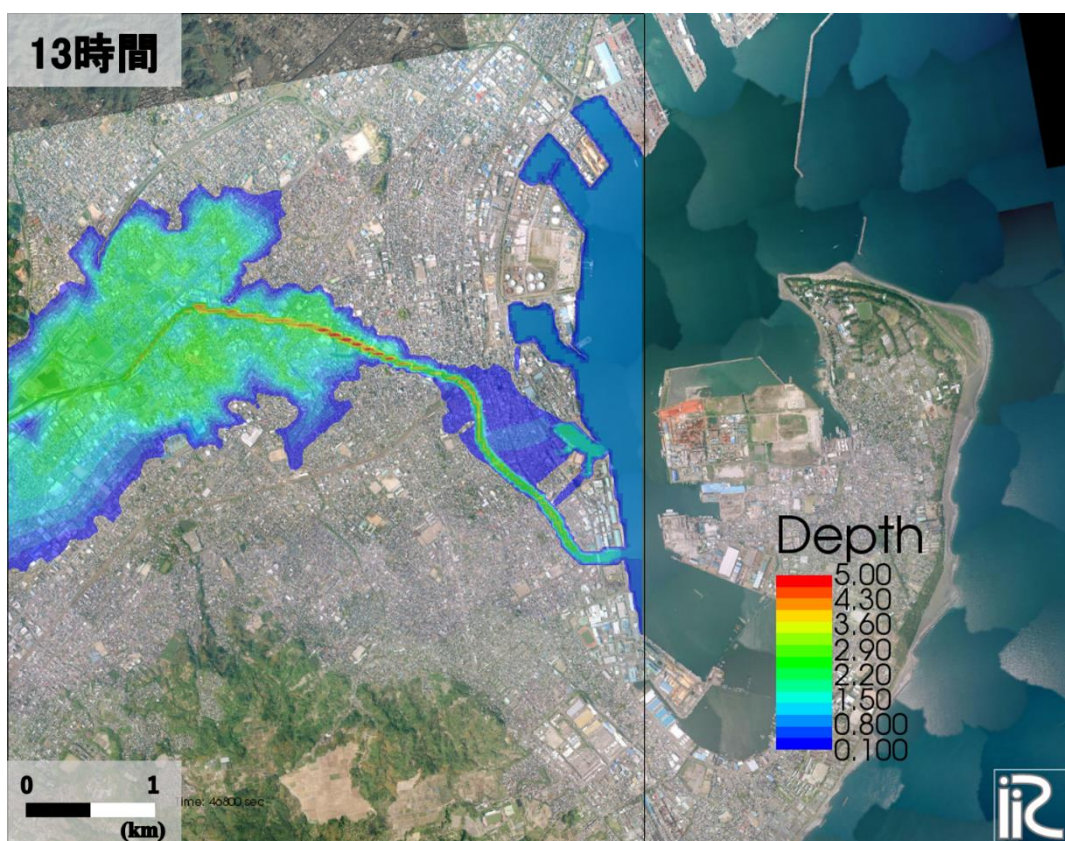
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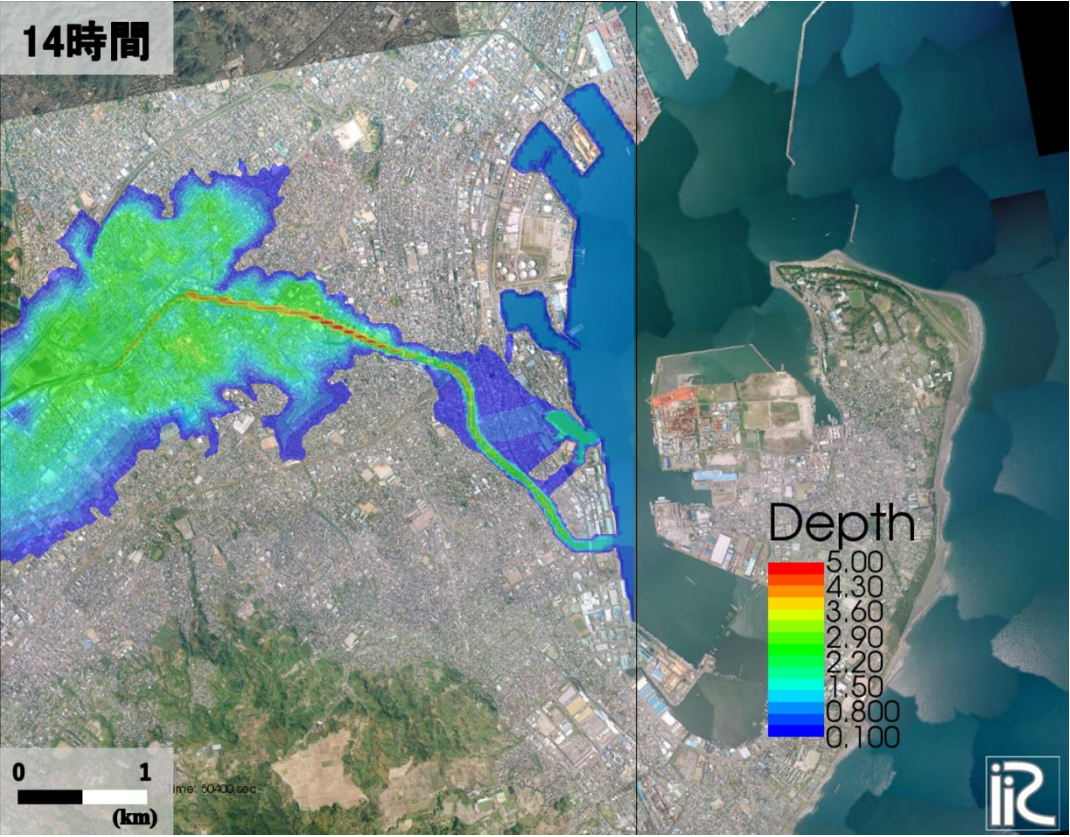
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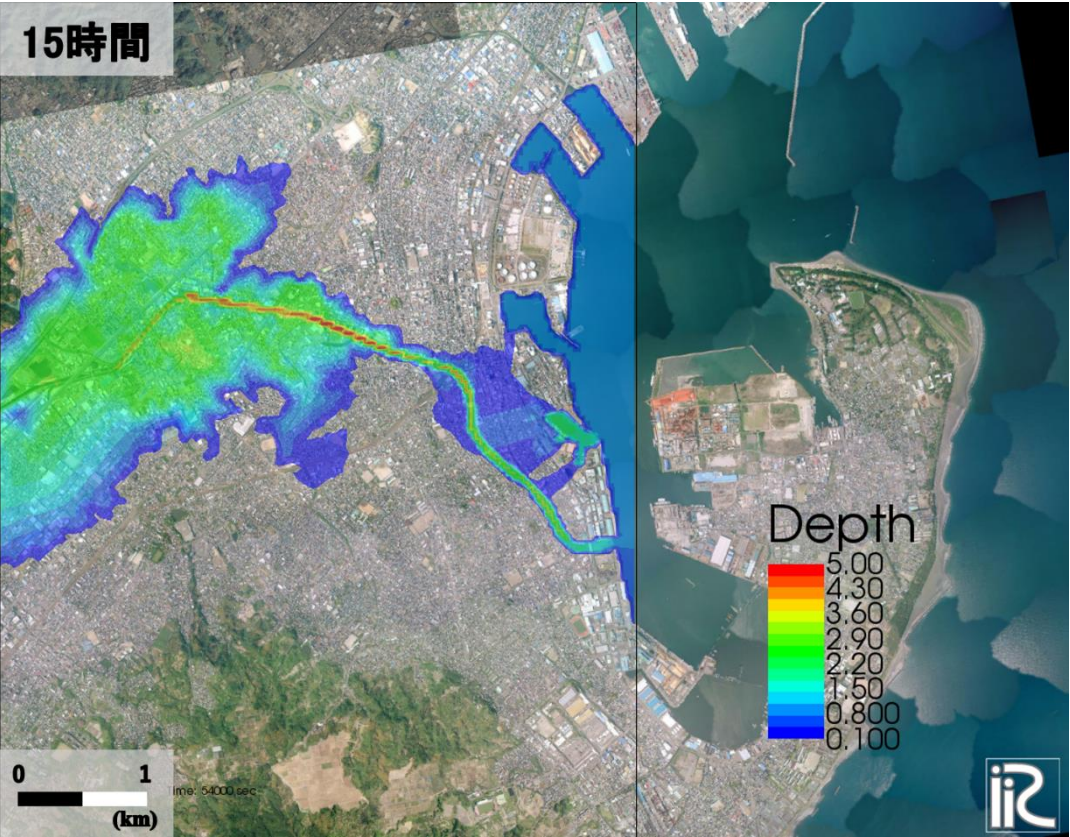
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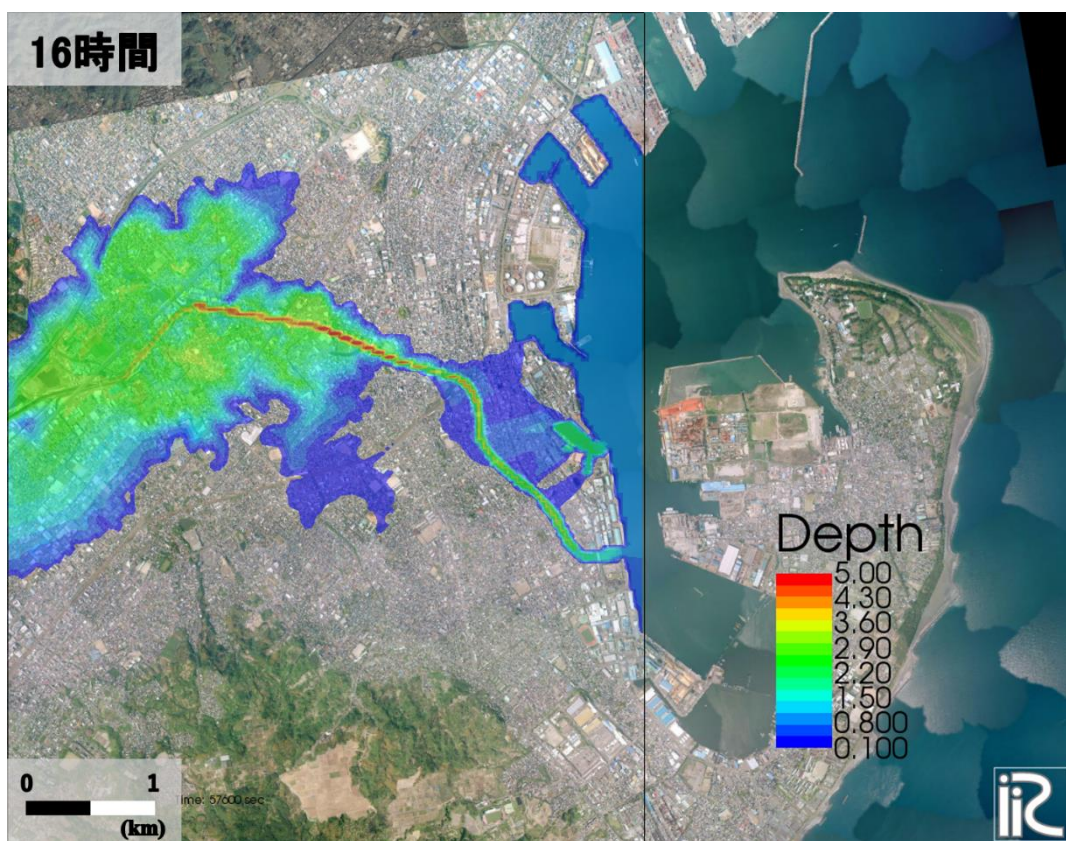
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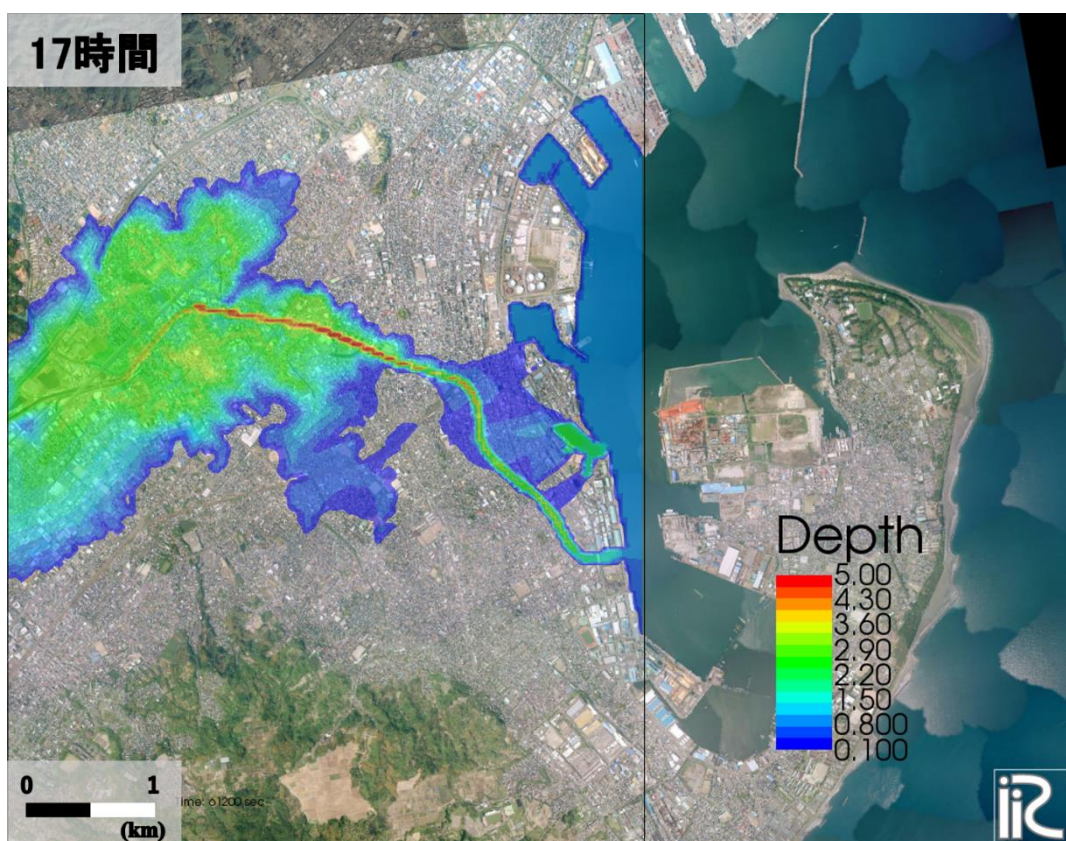
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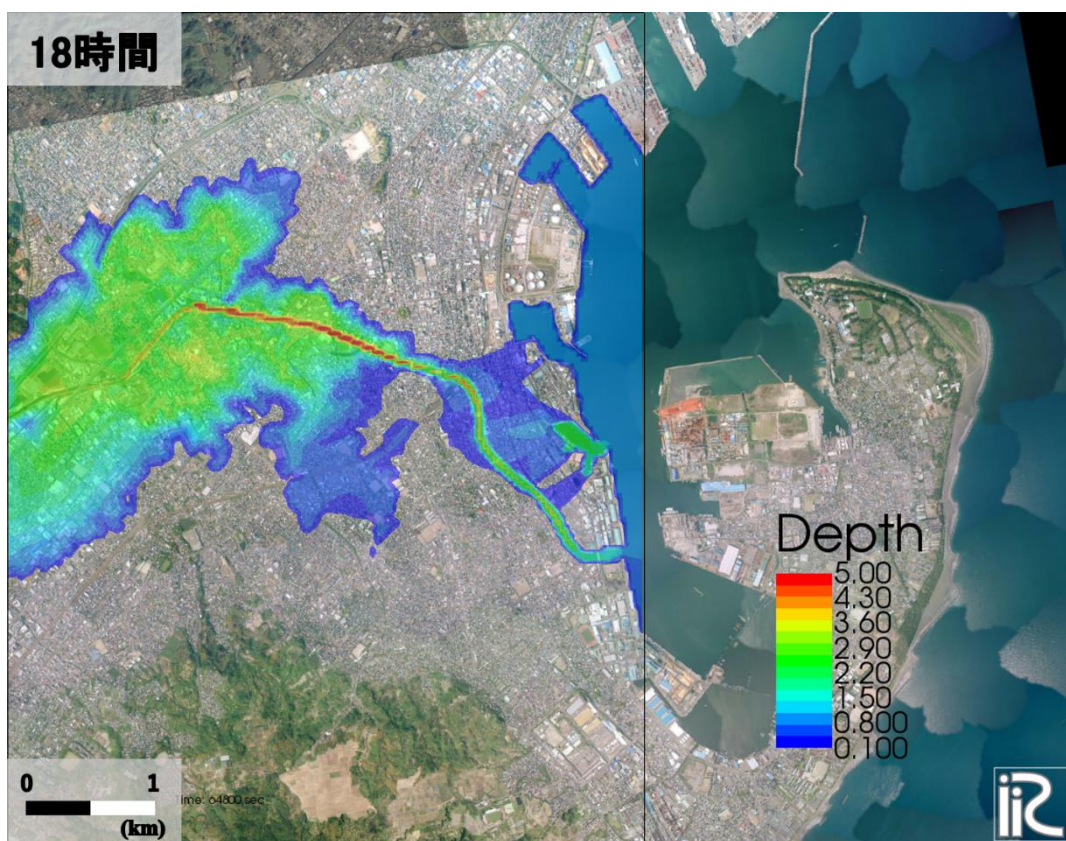
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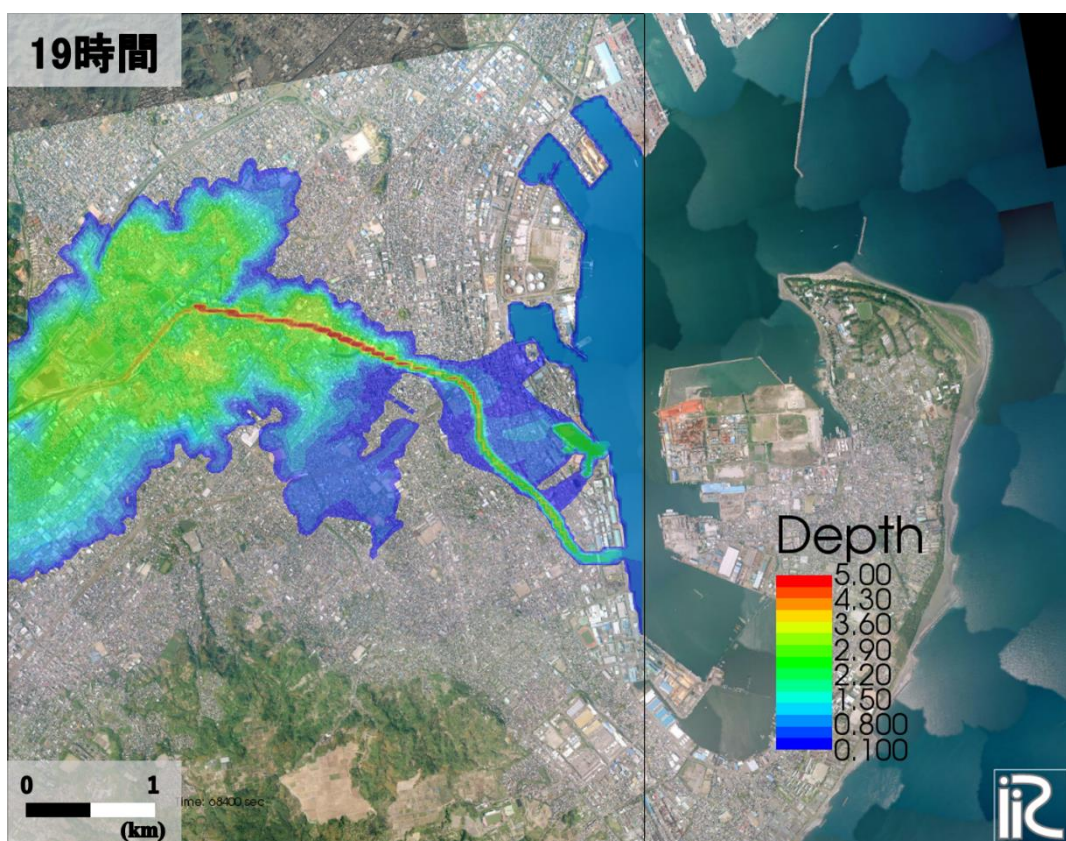
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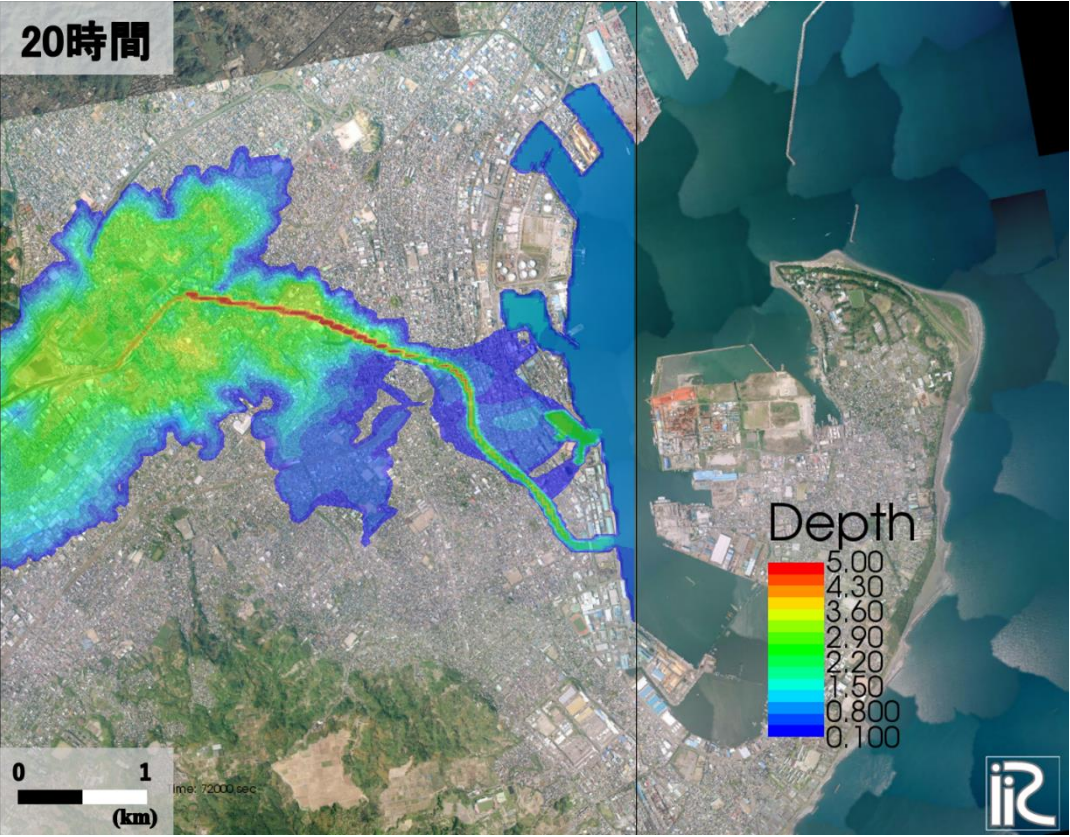
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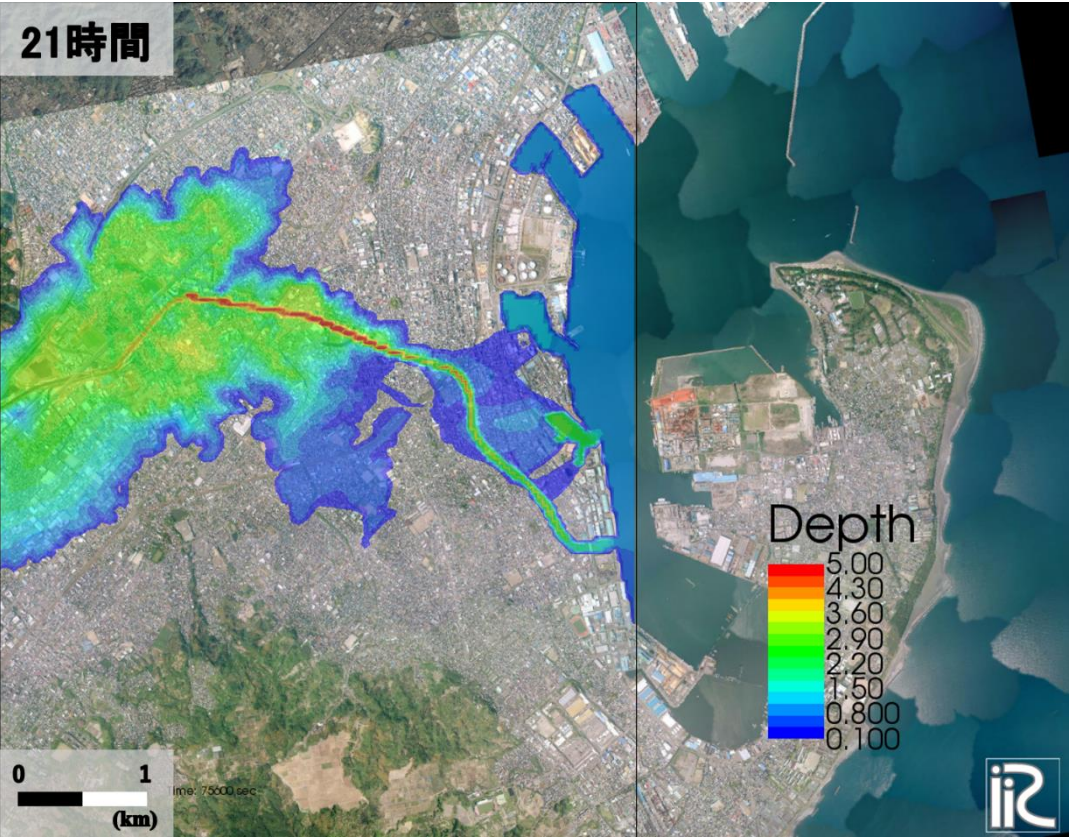
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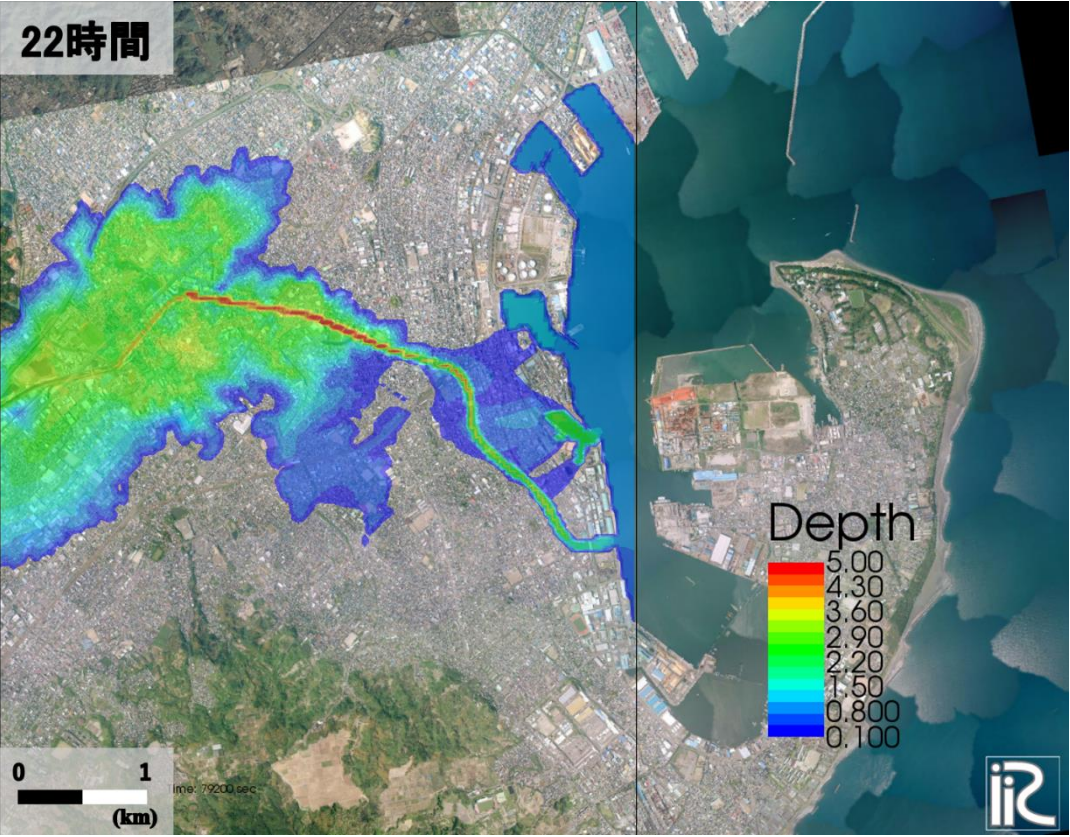
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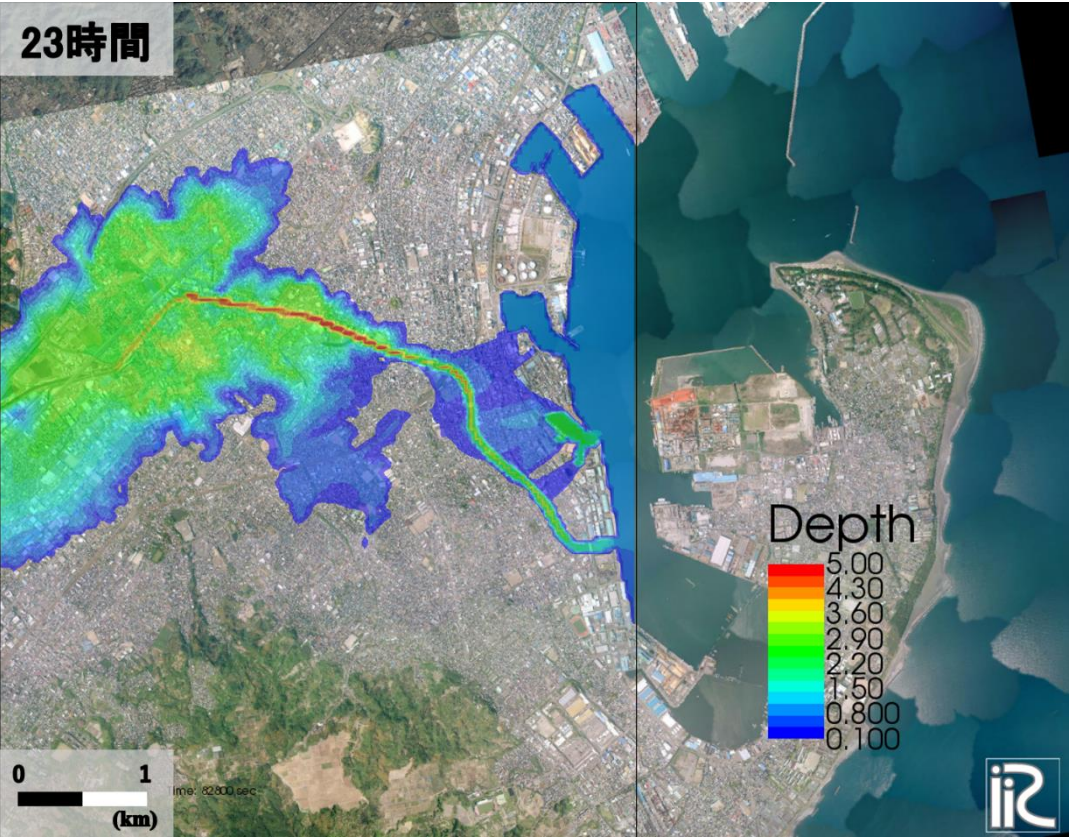
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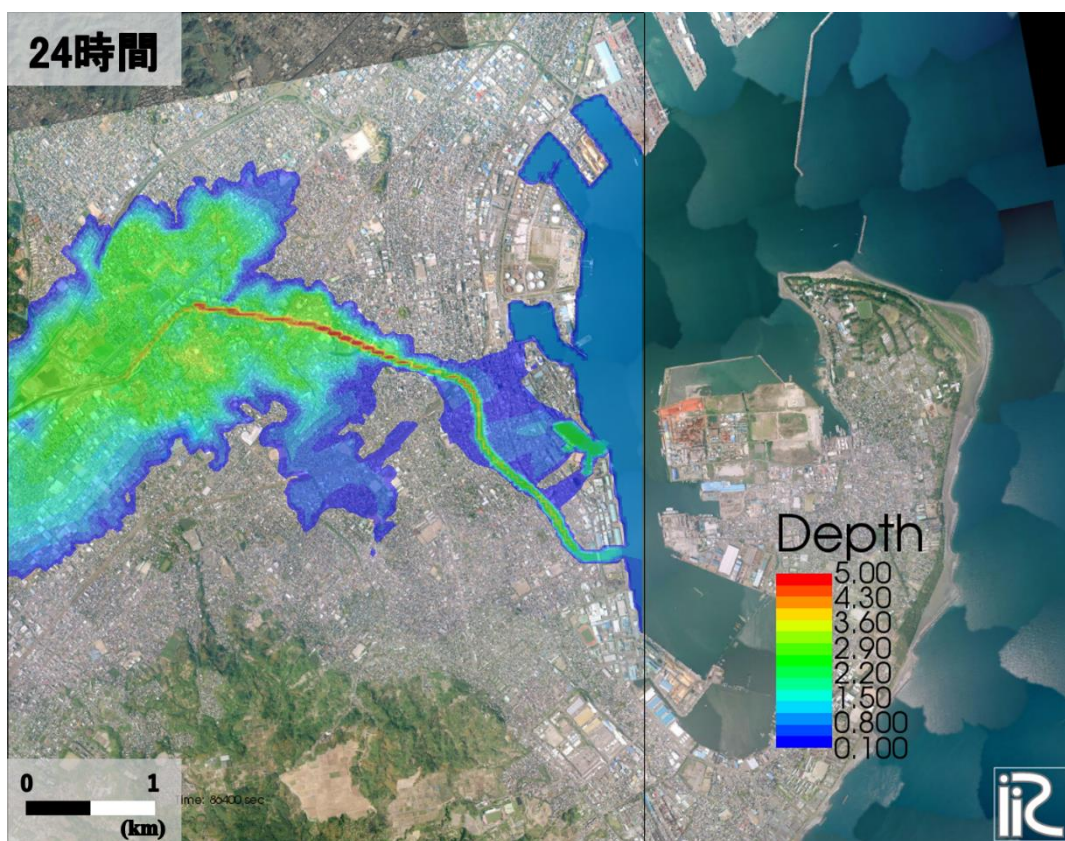
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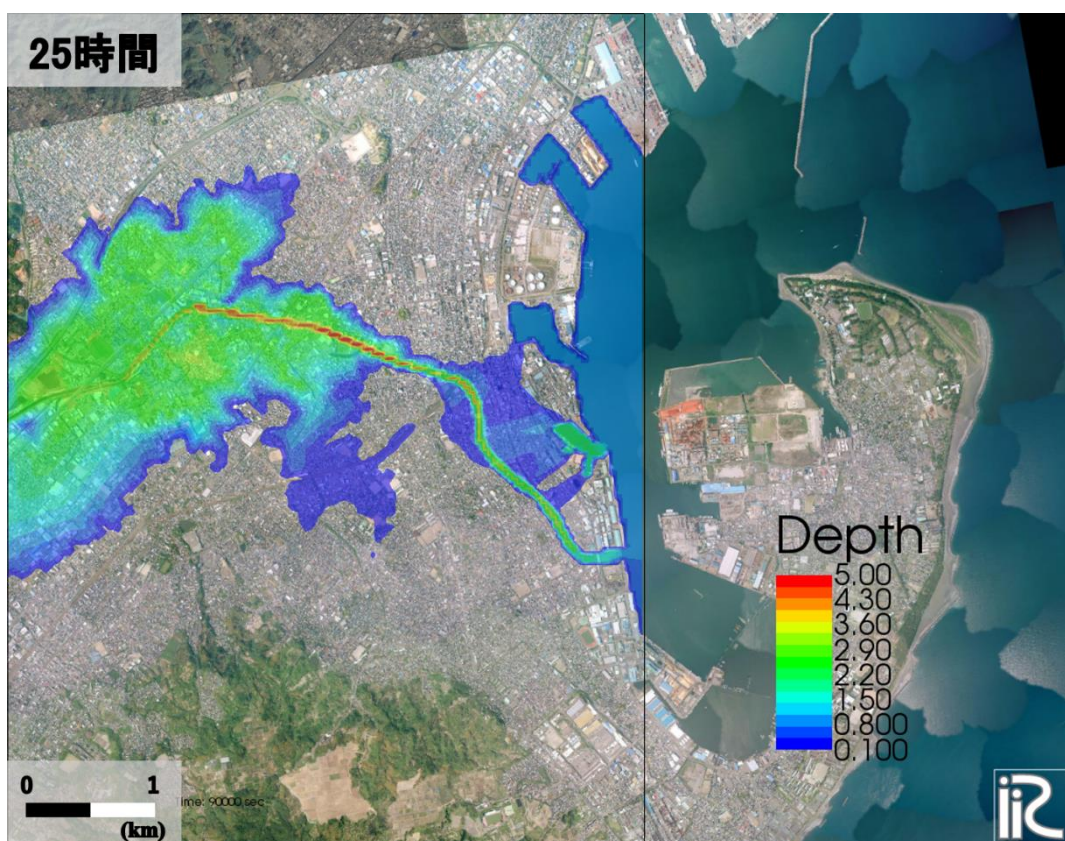
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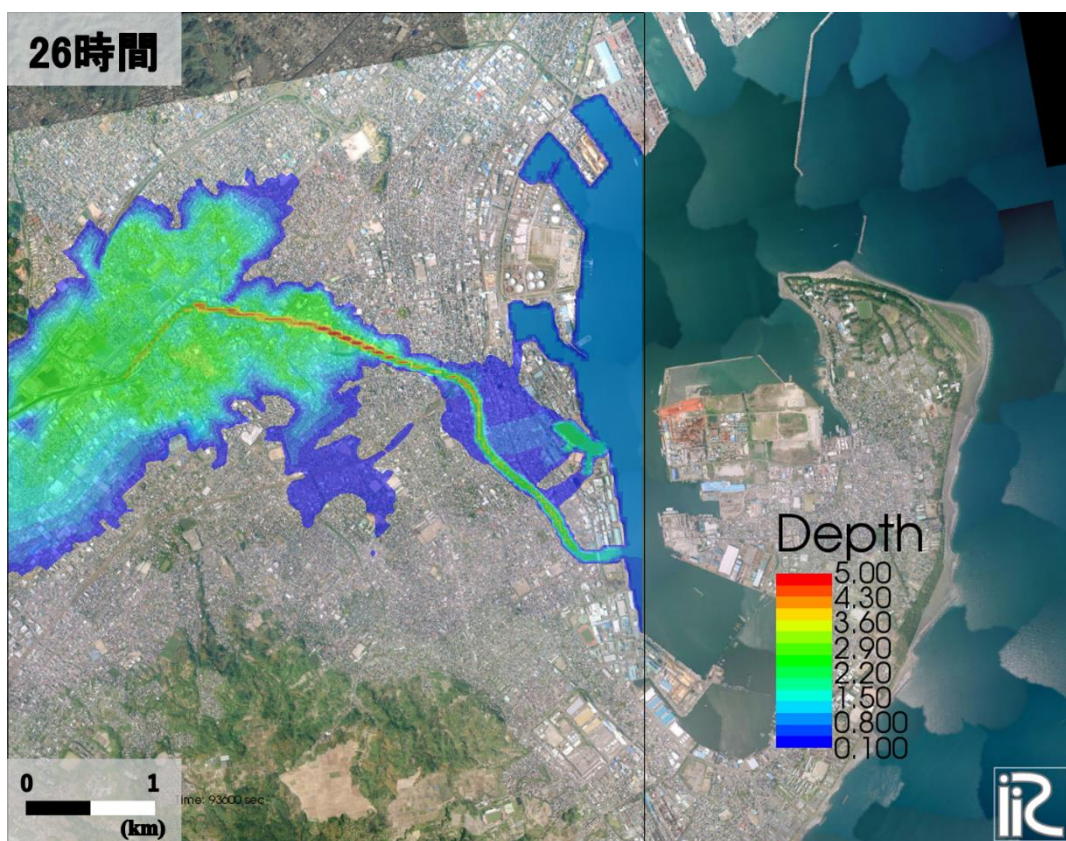
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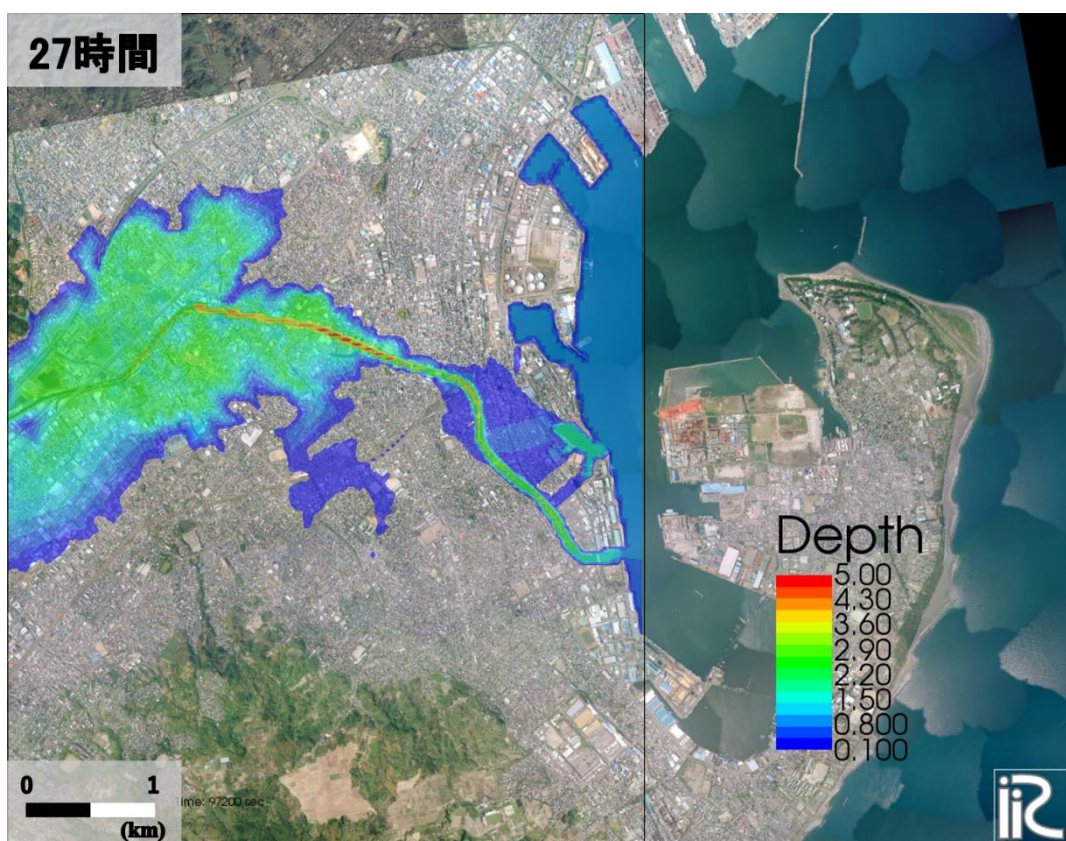
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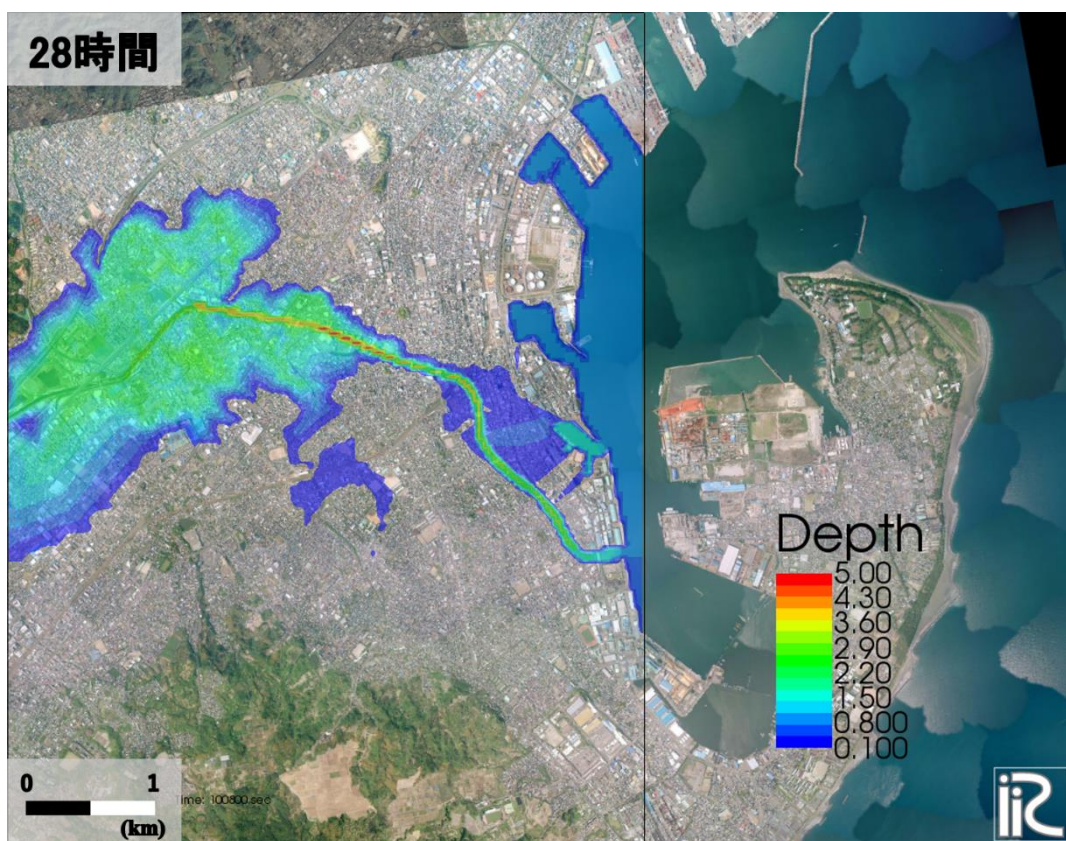
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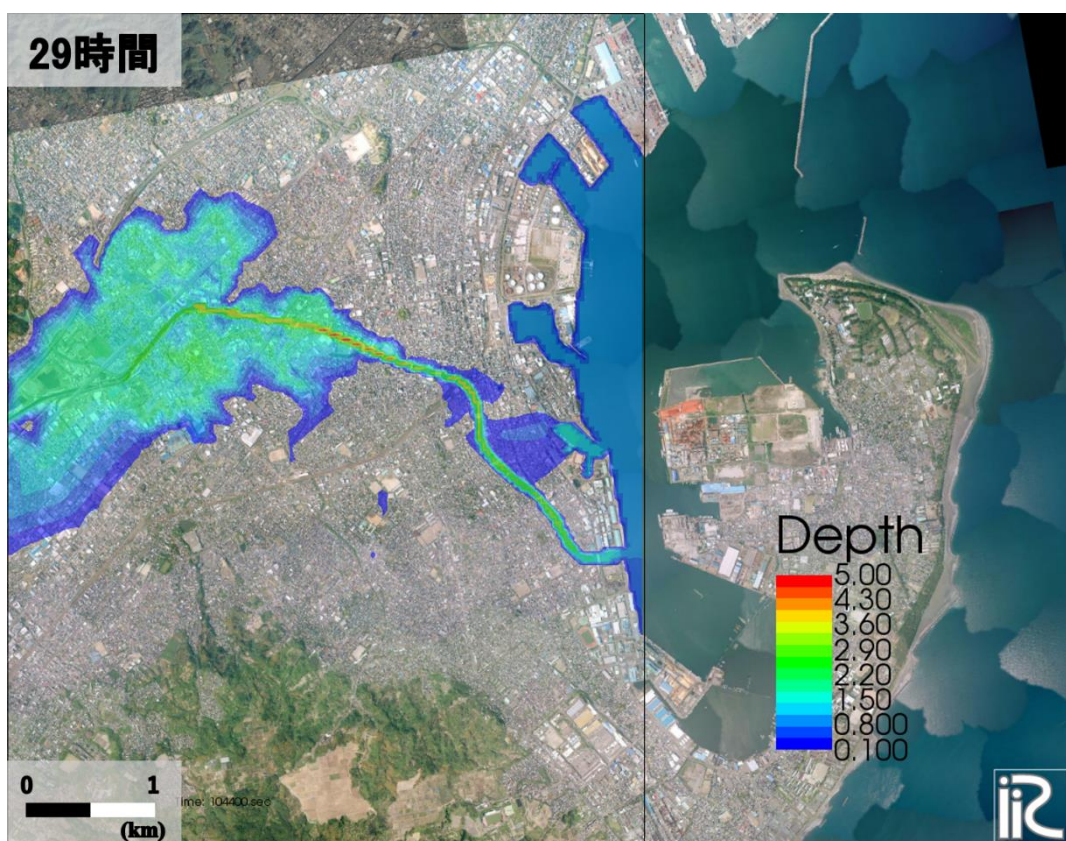
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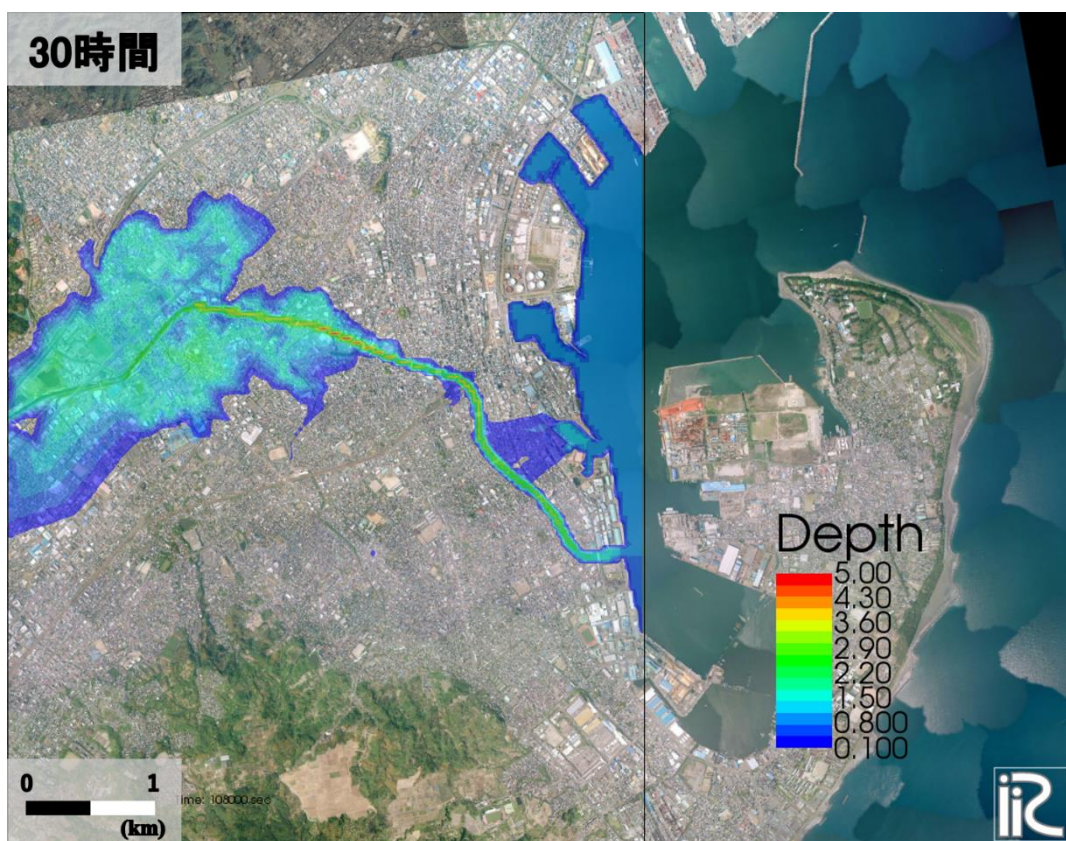
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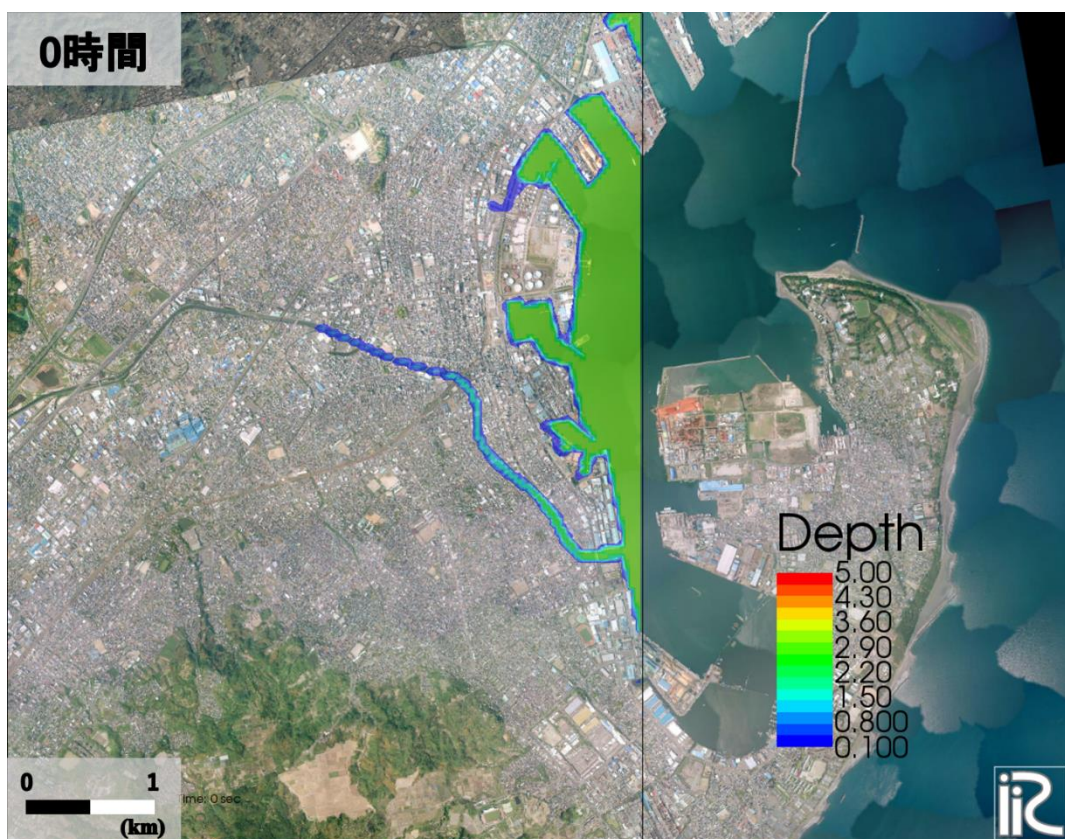
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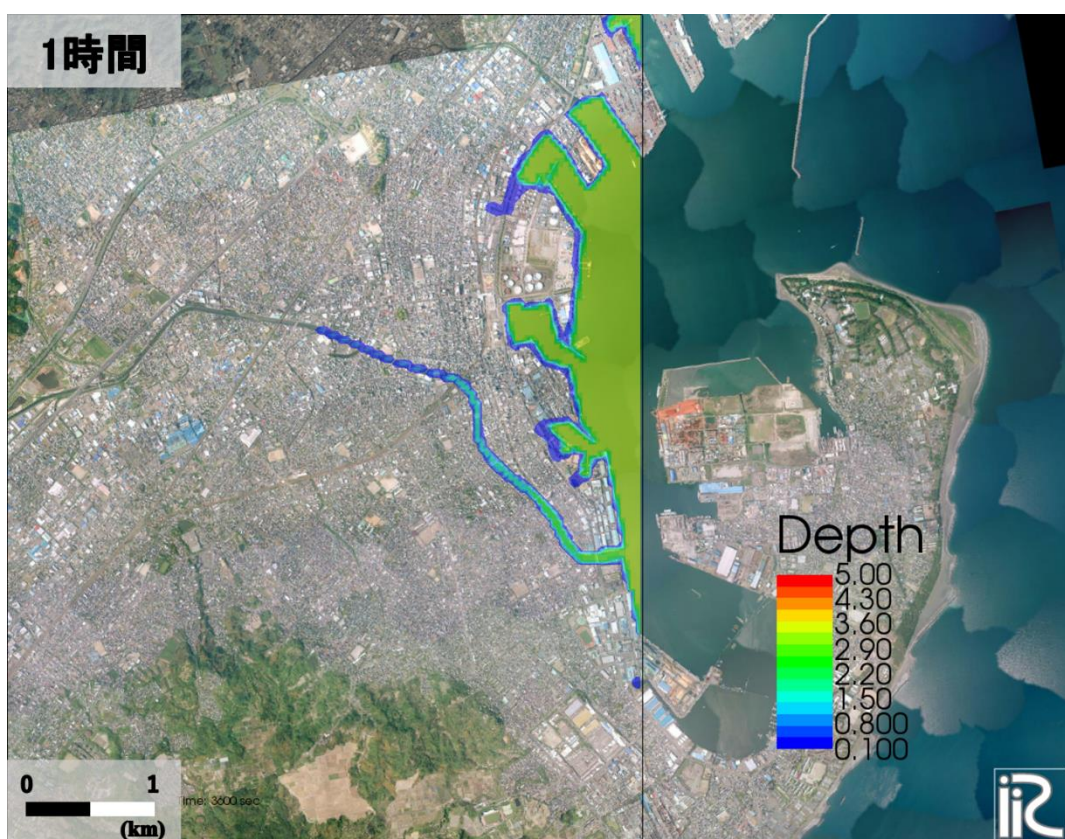
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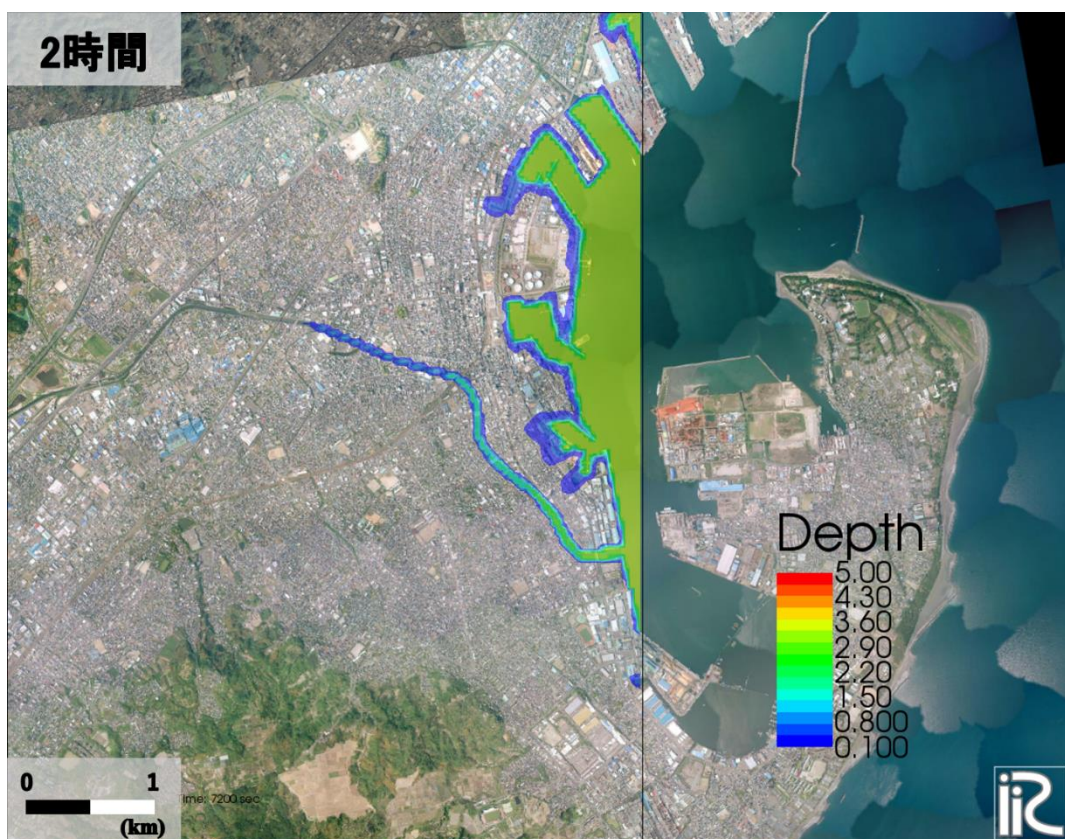
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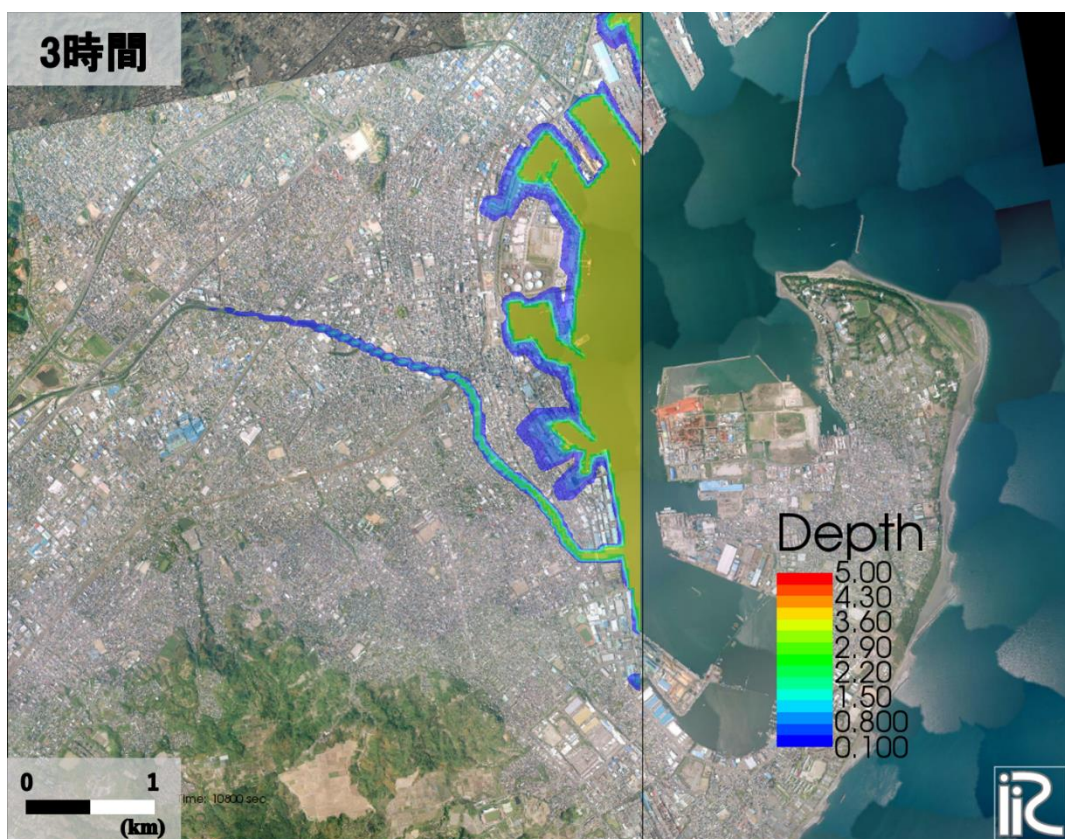
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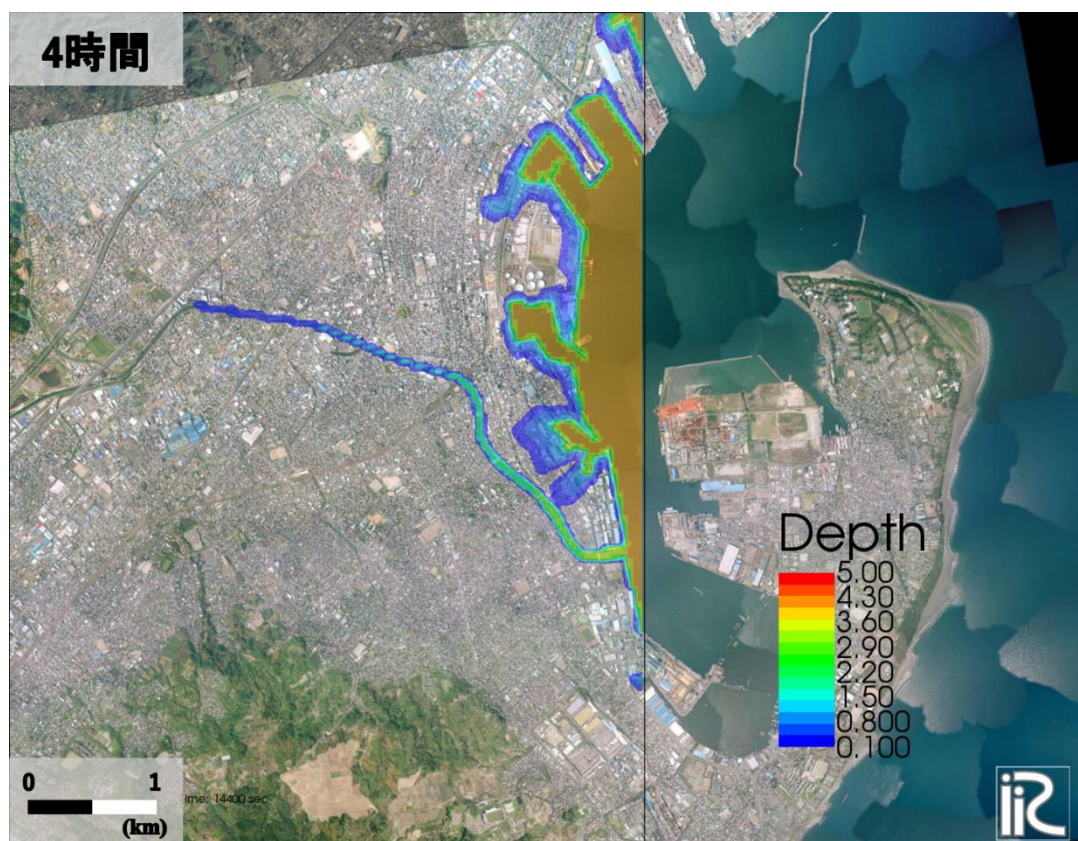


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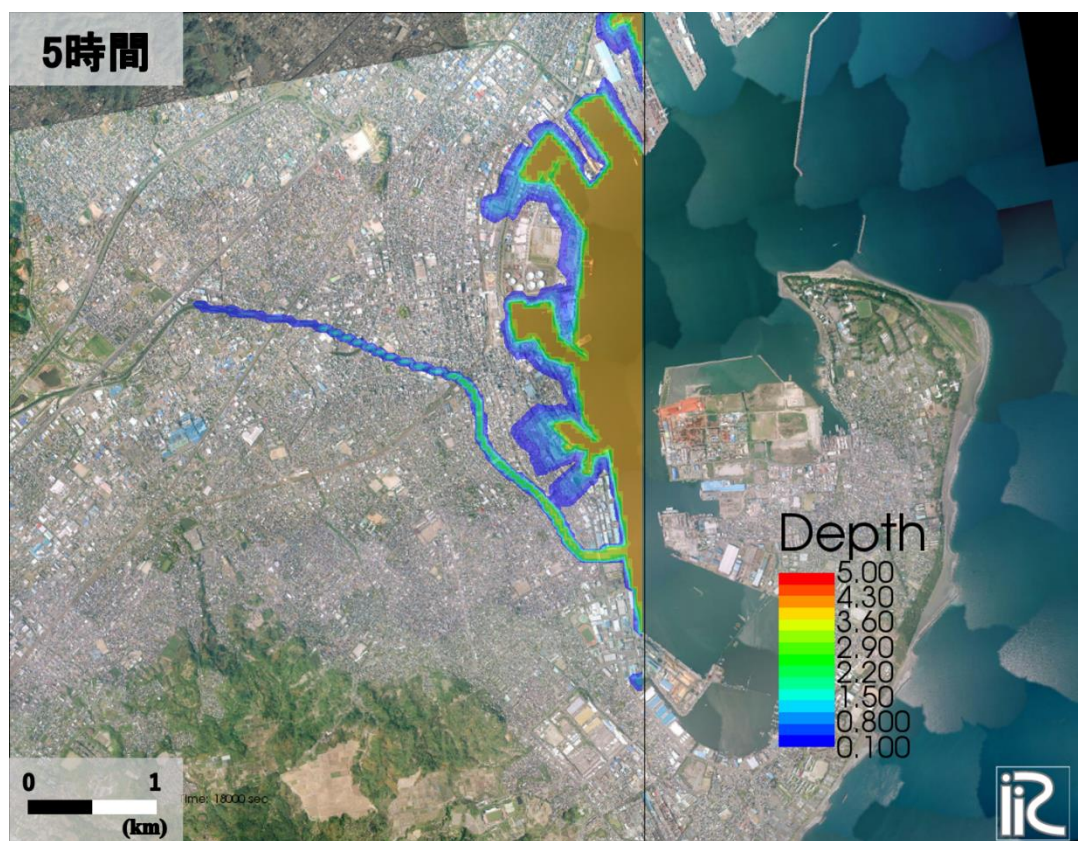
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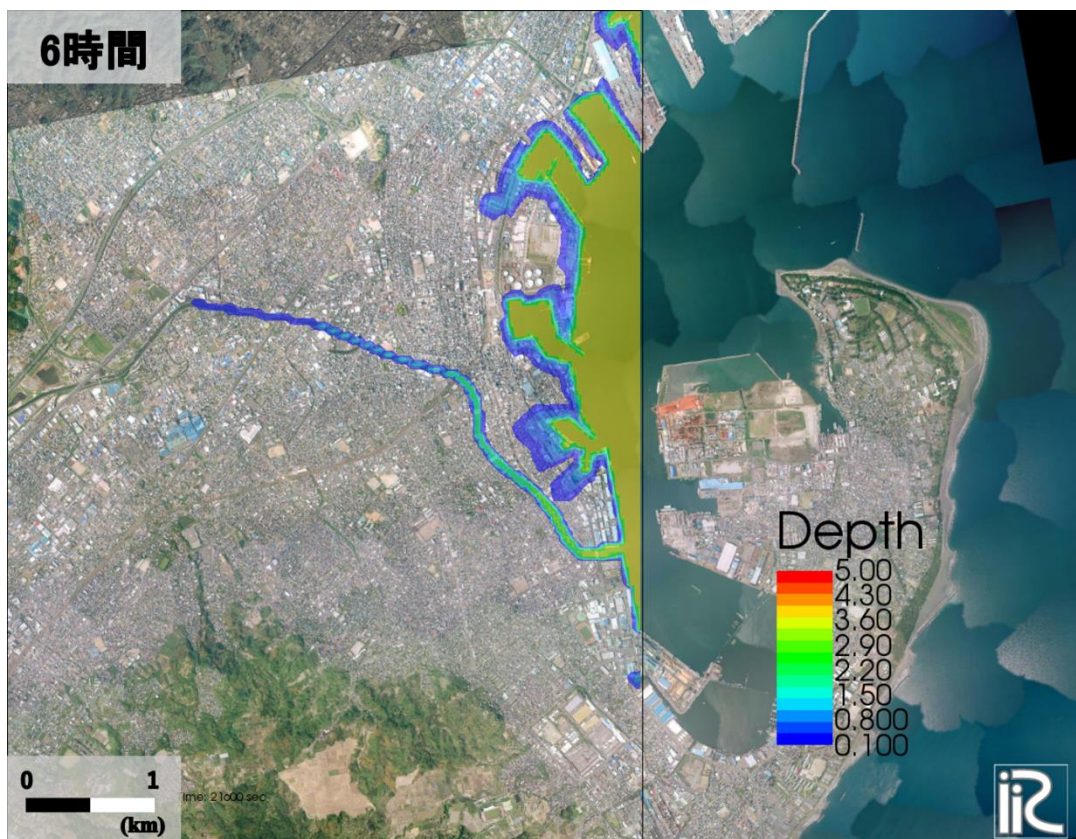
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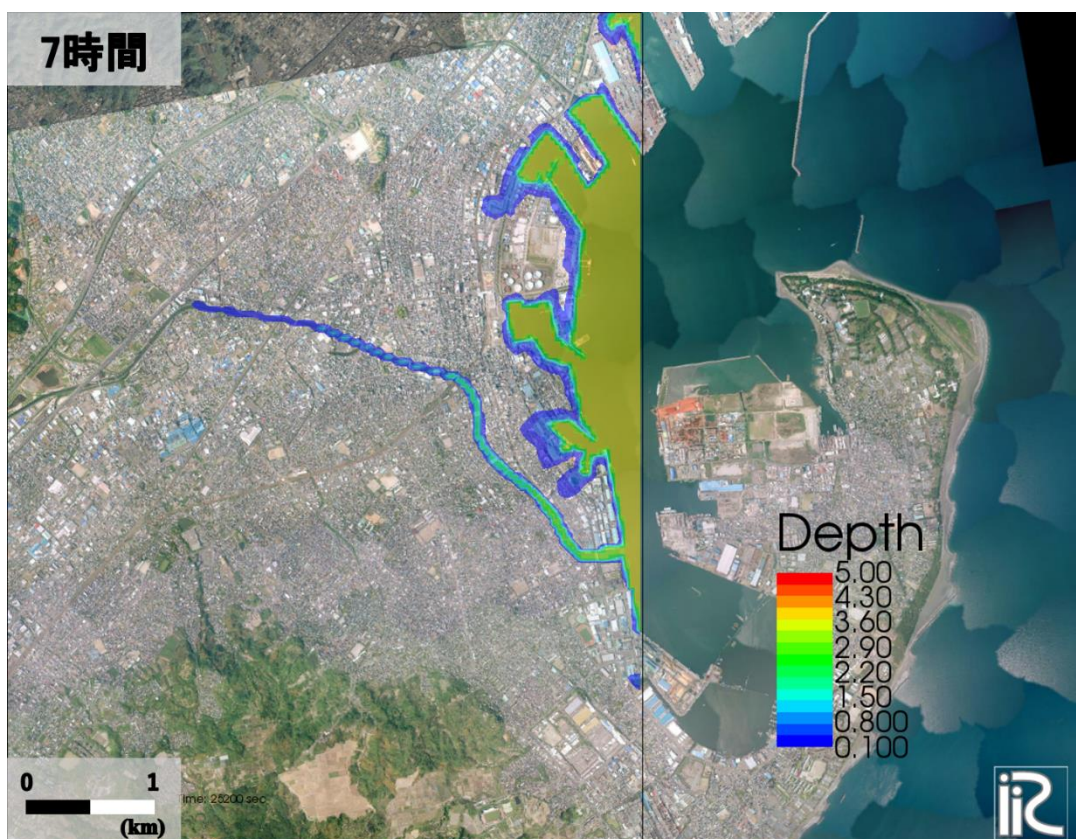
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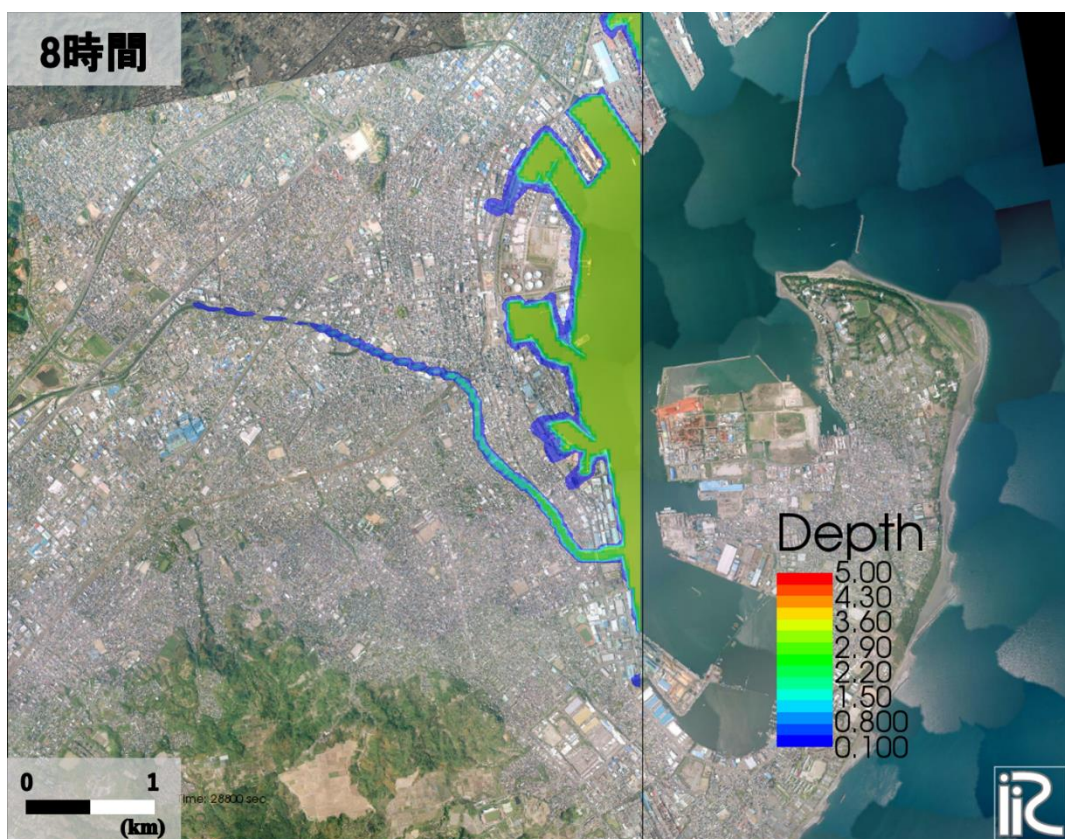
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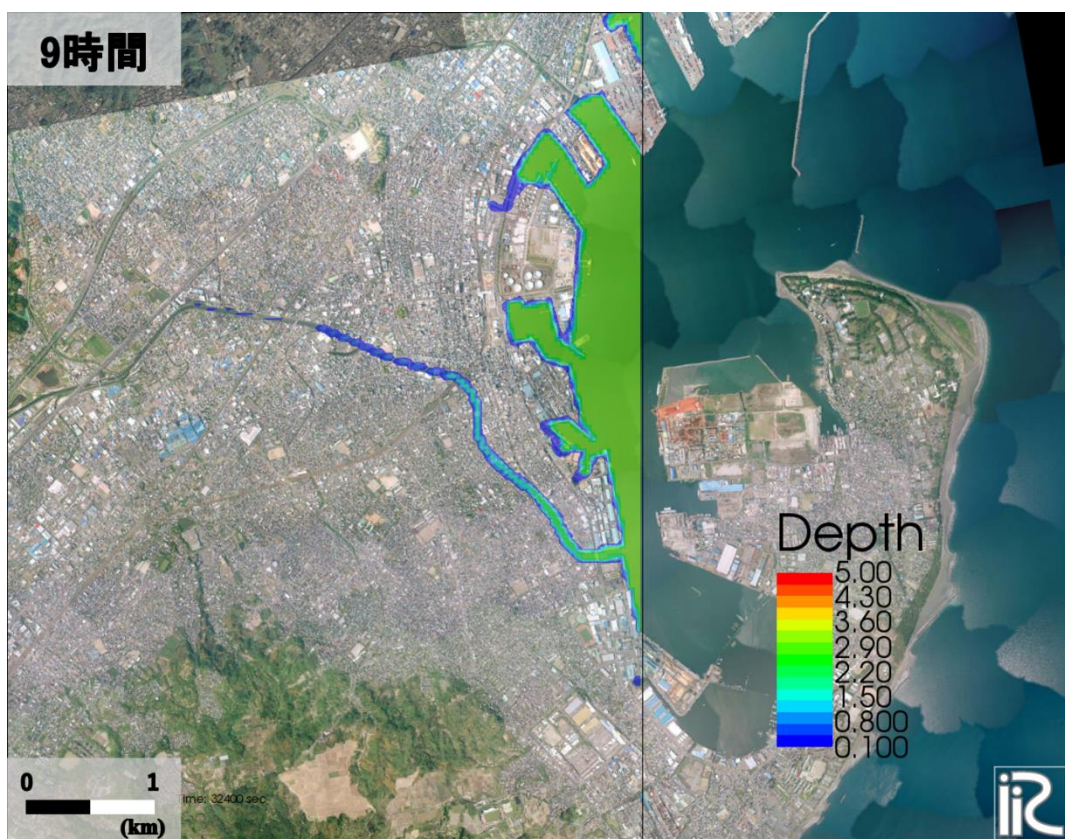
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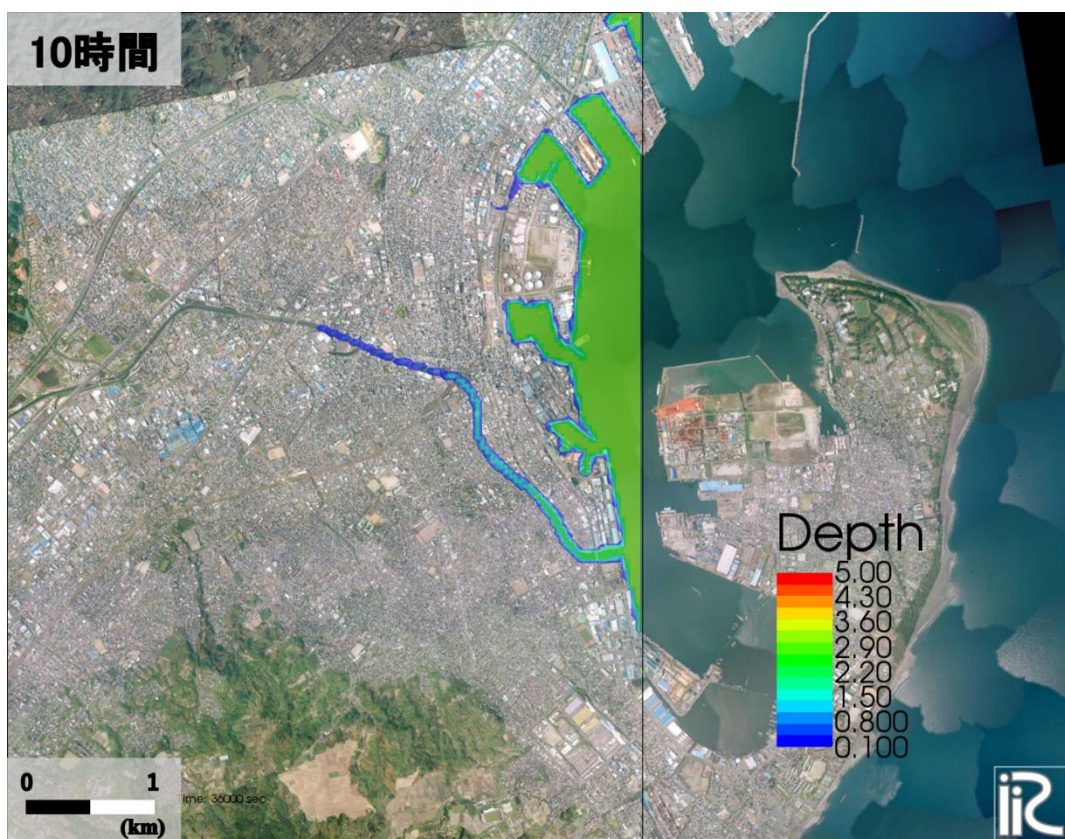
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2.6 I

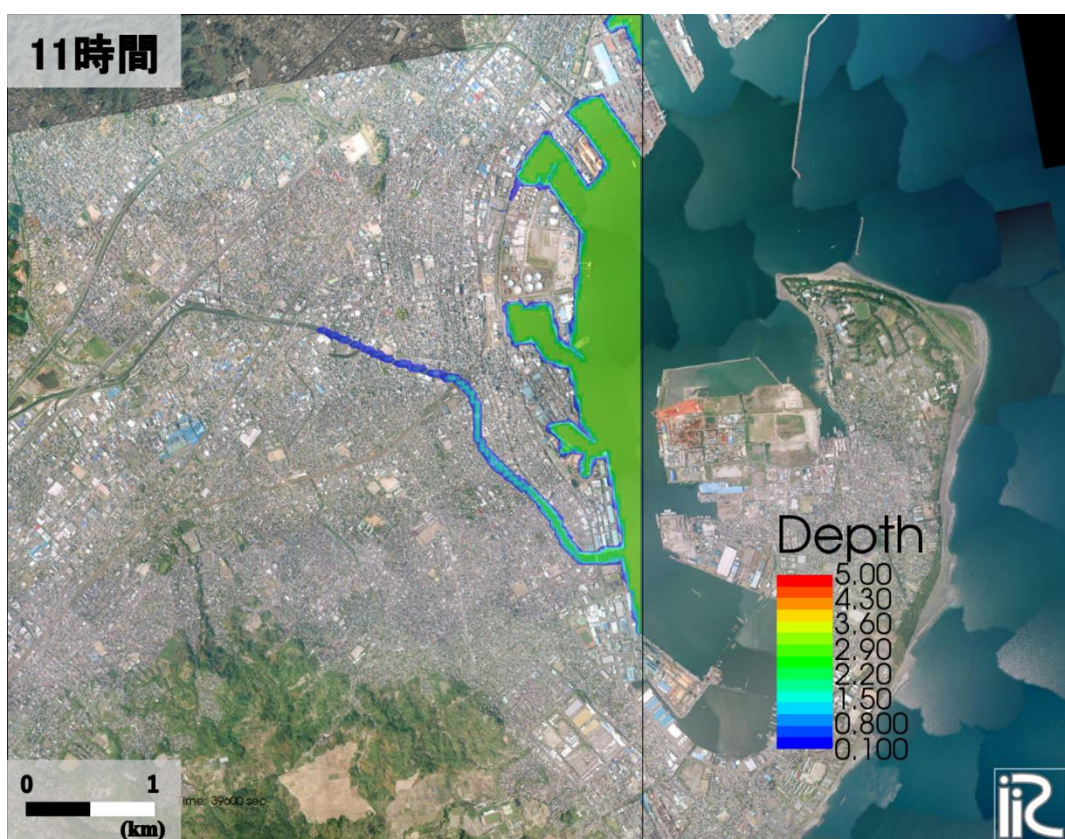


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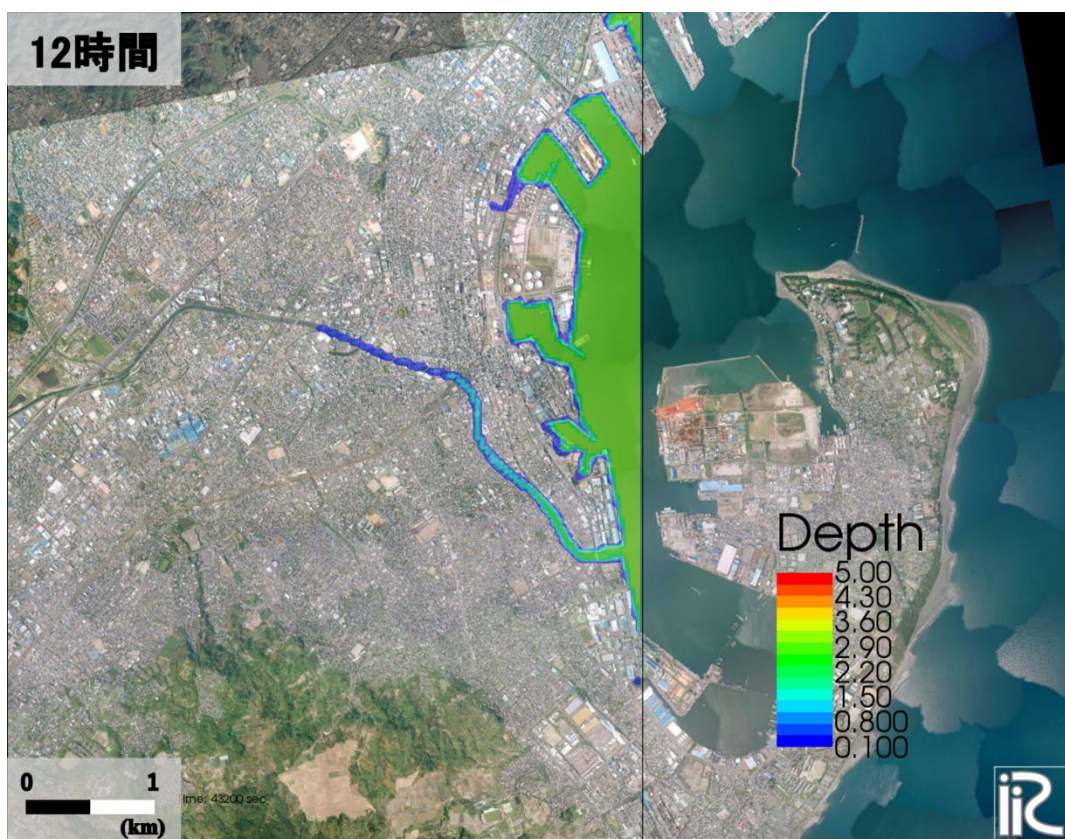
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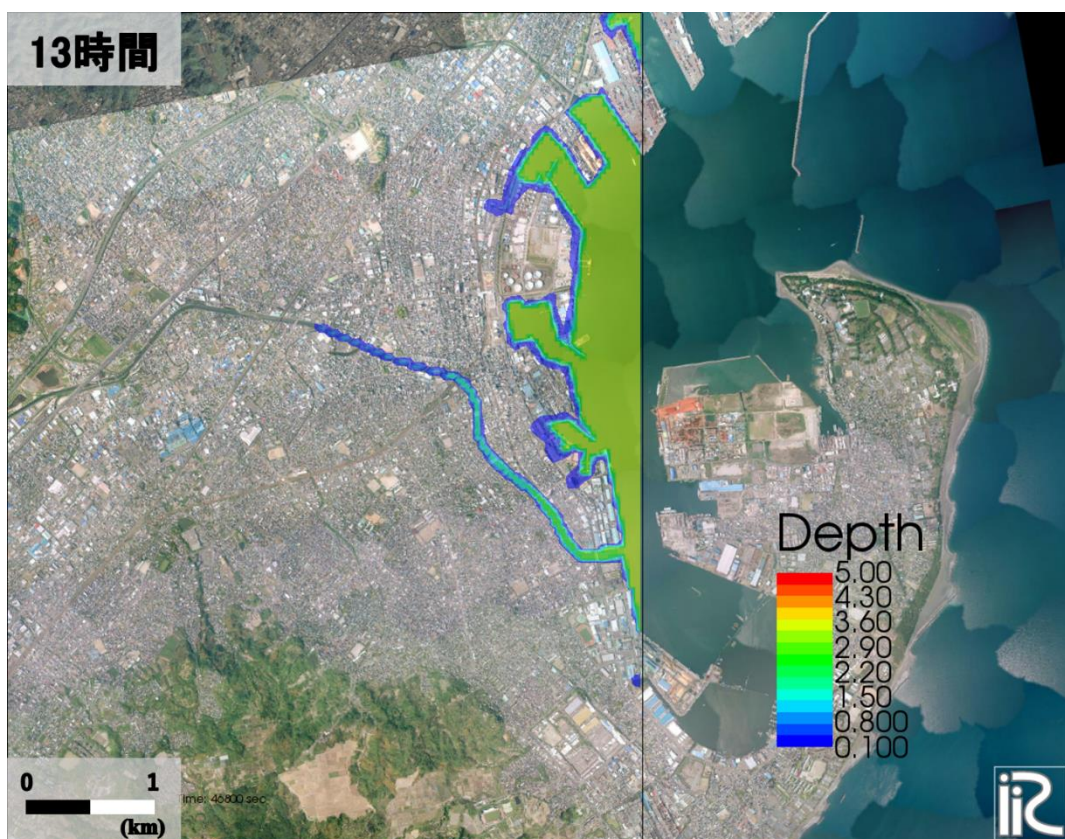
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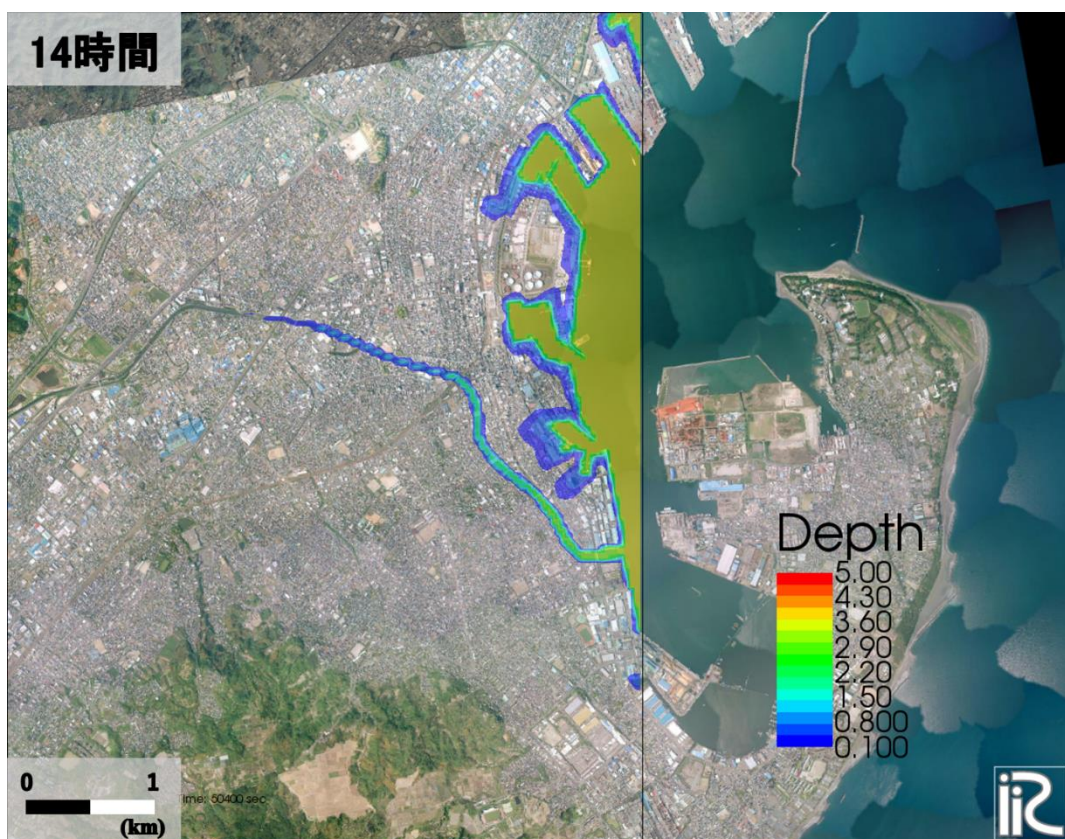
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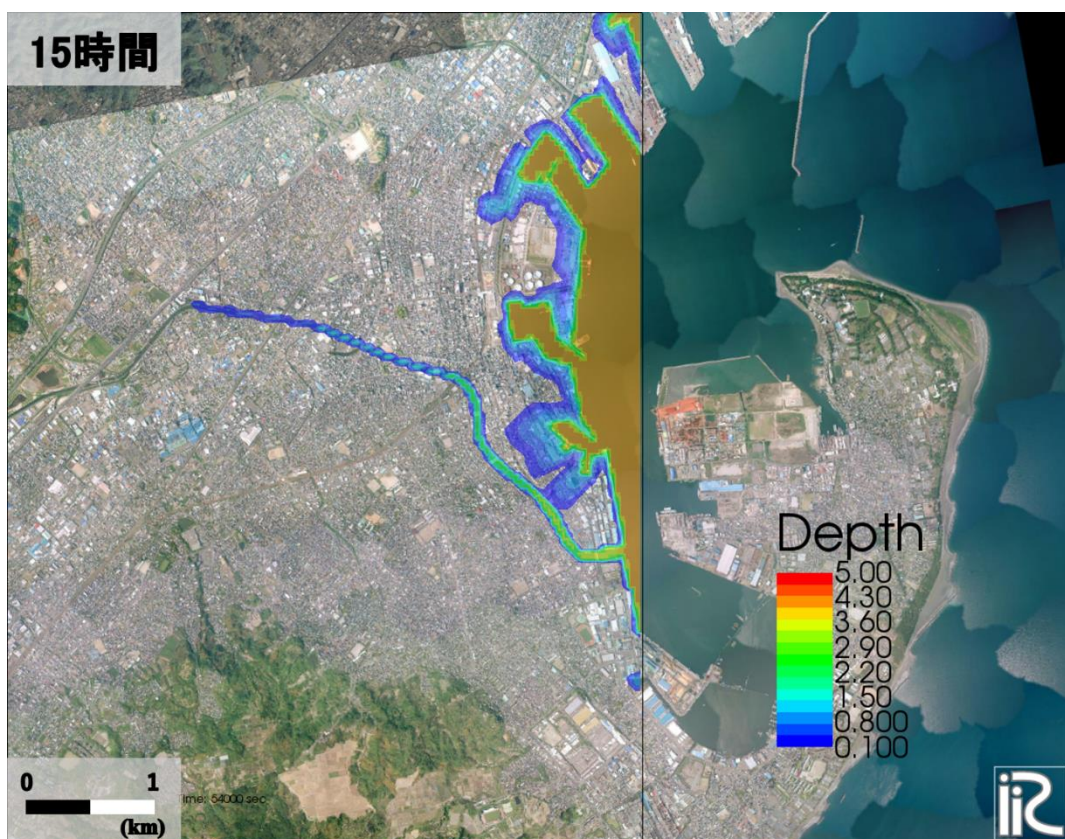
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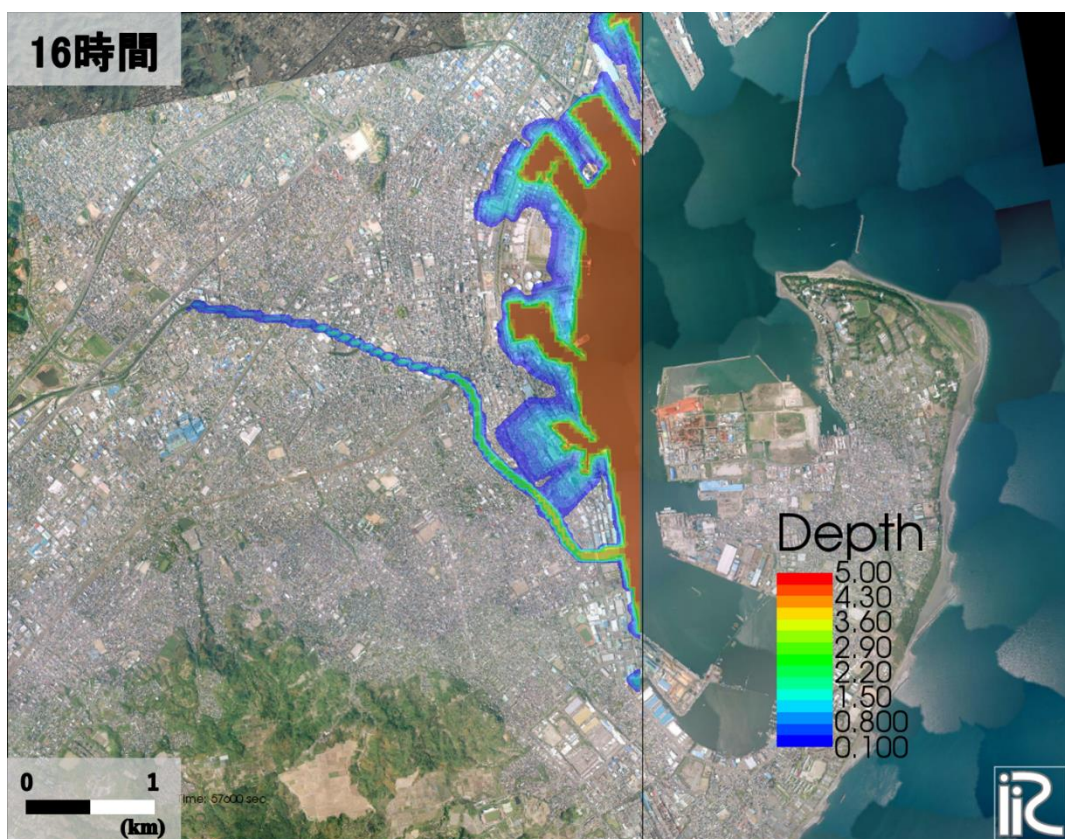
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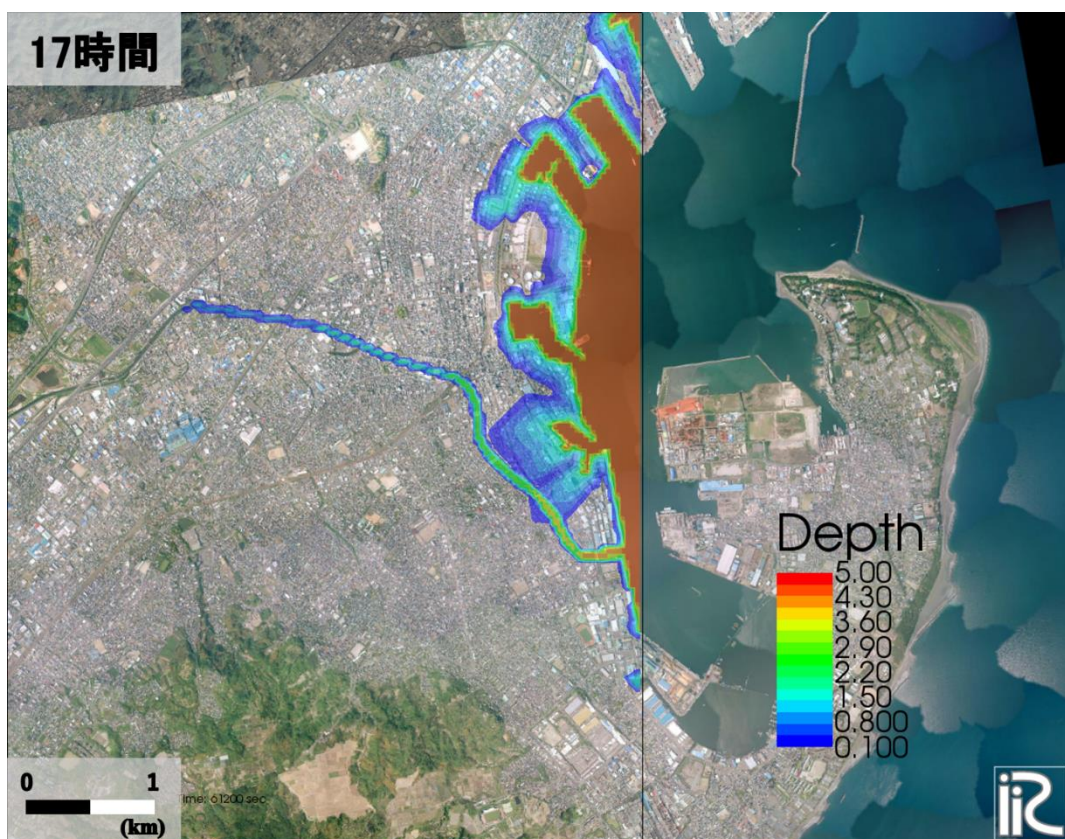
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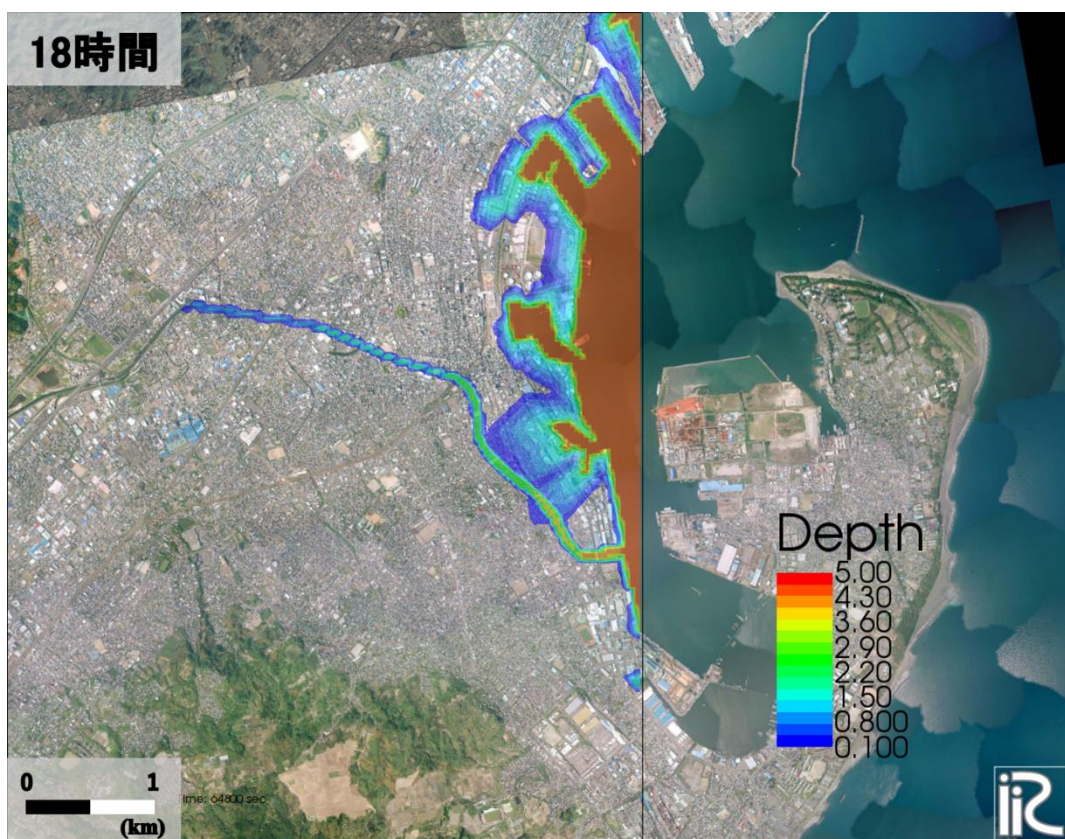
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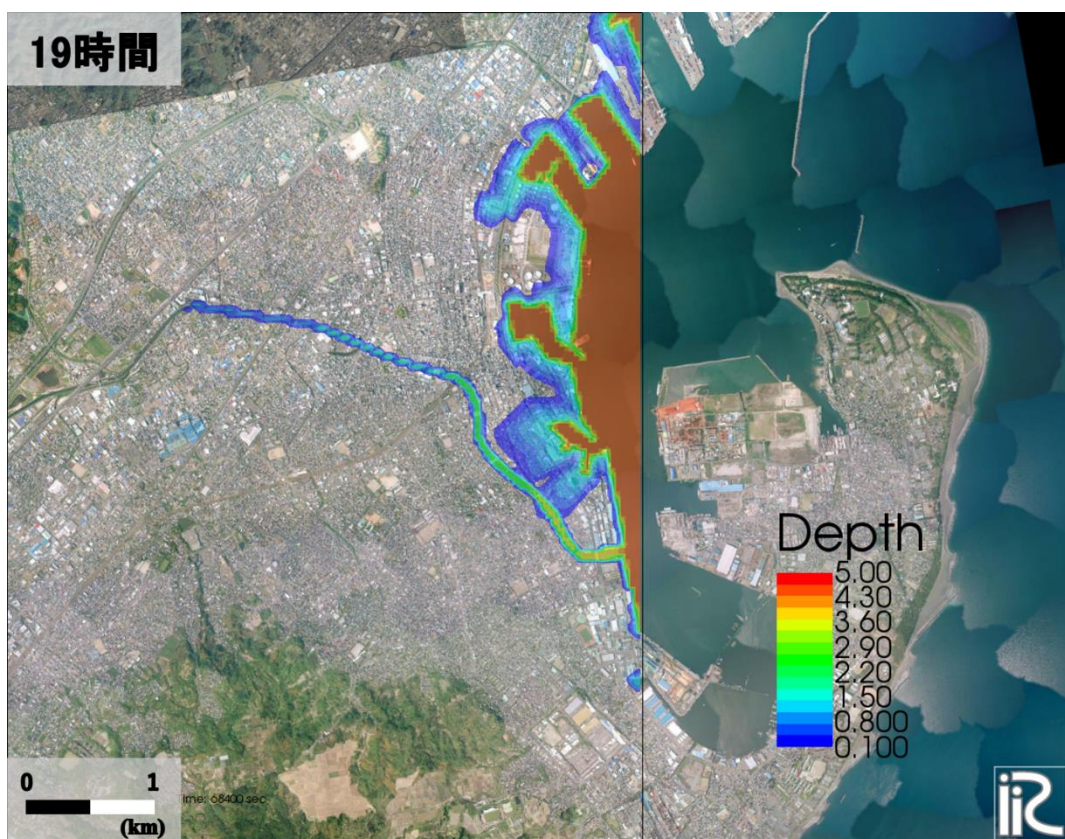
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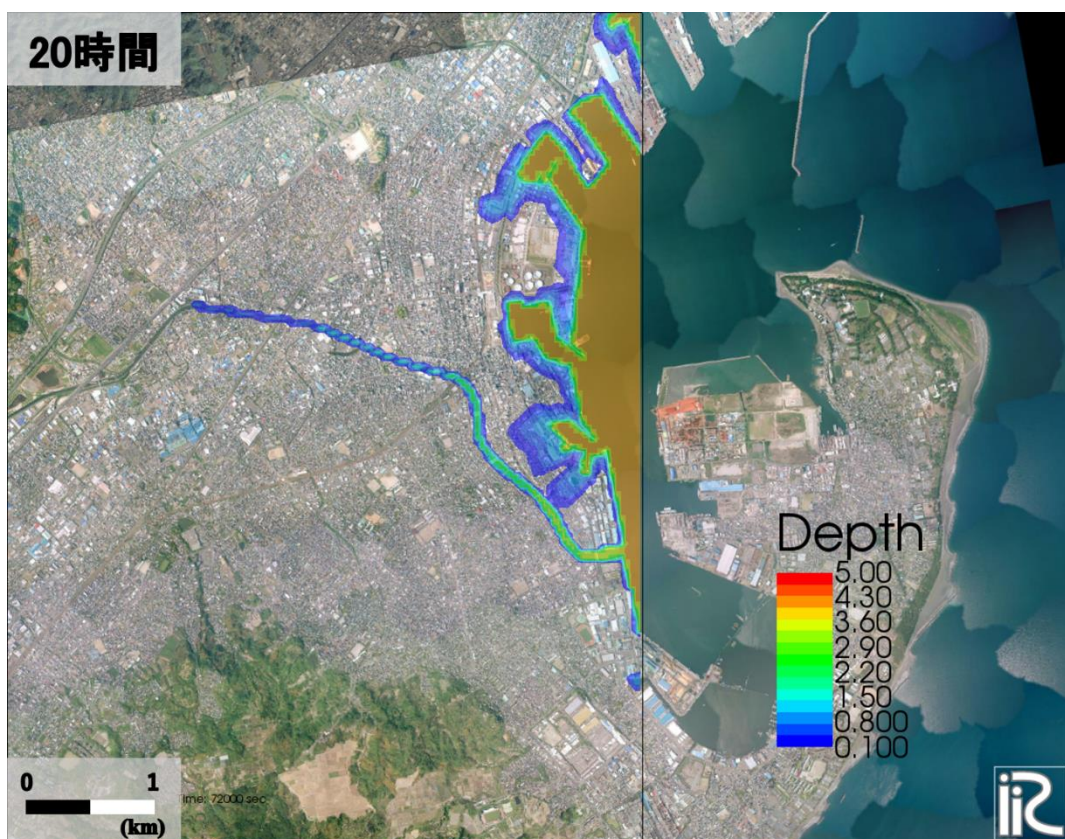
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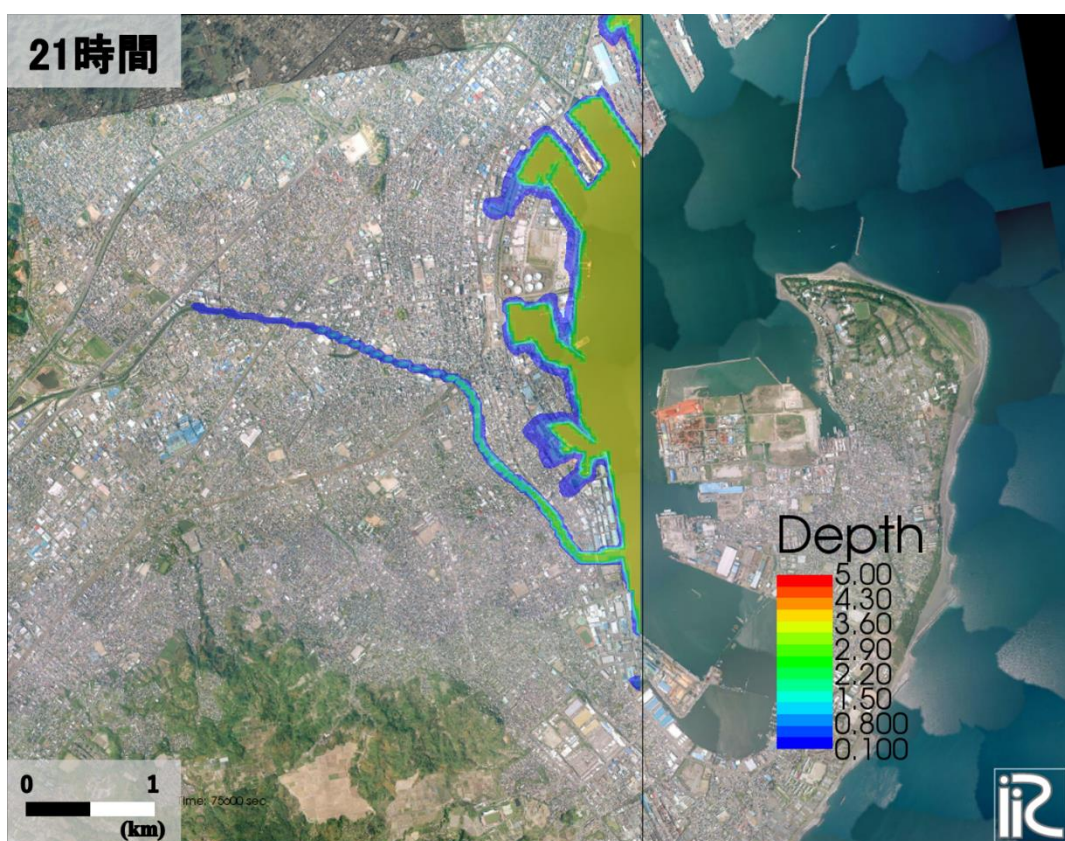
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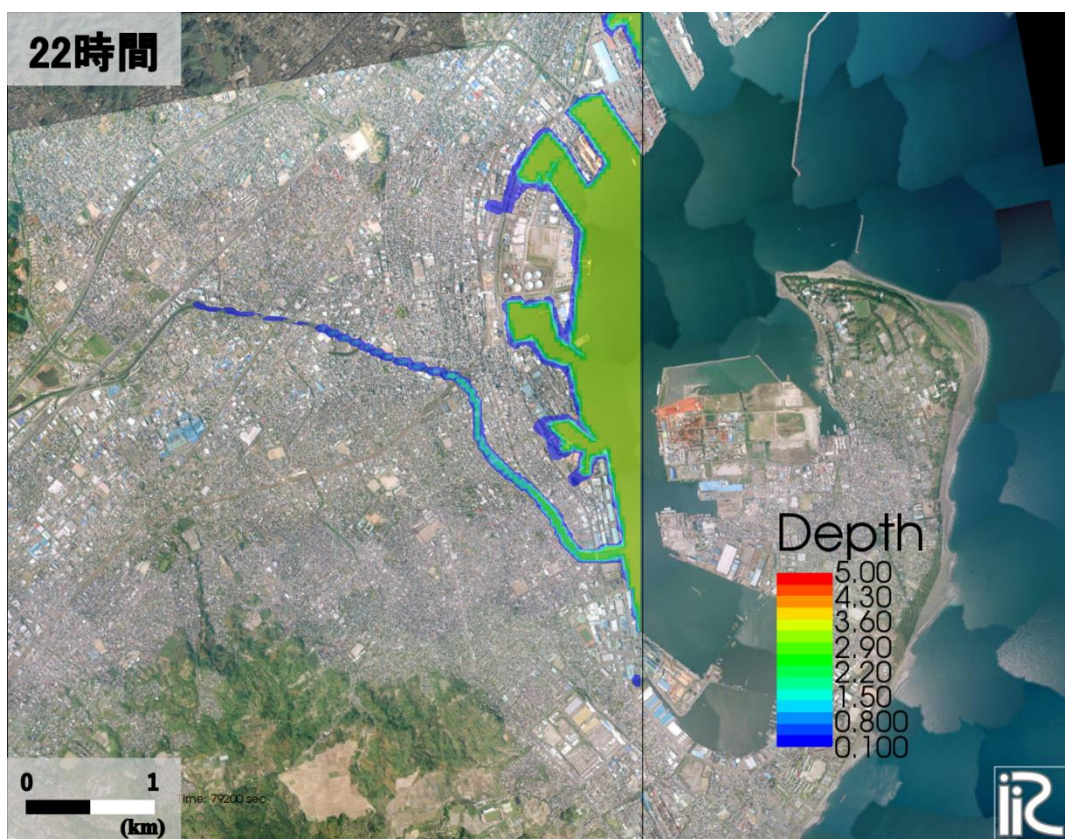
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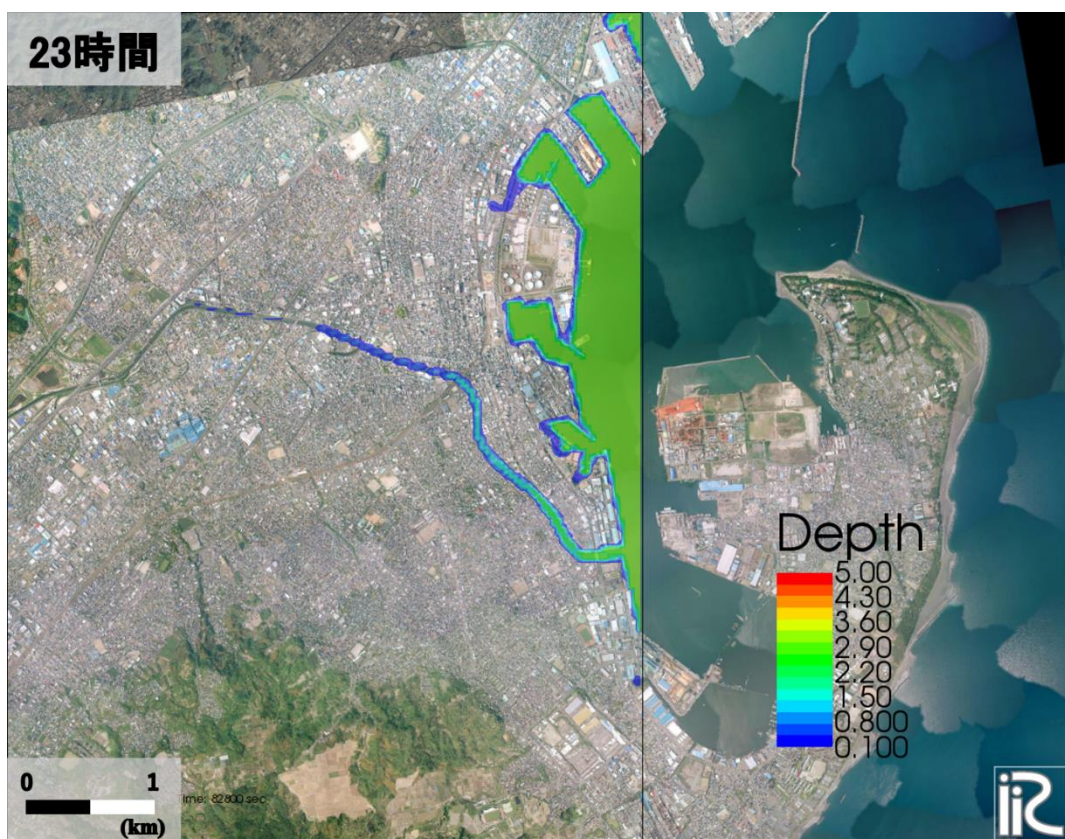
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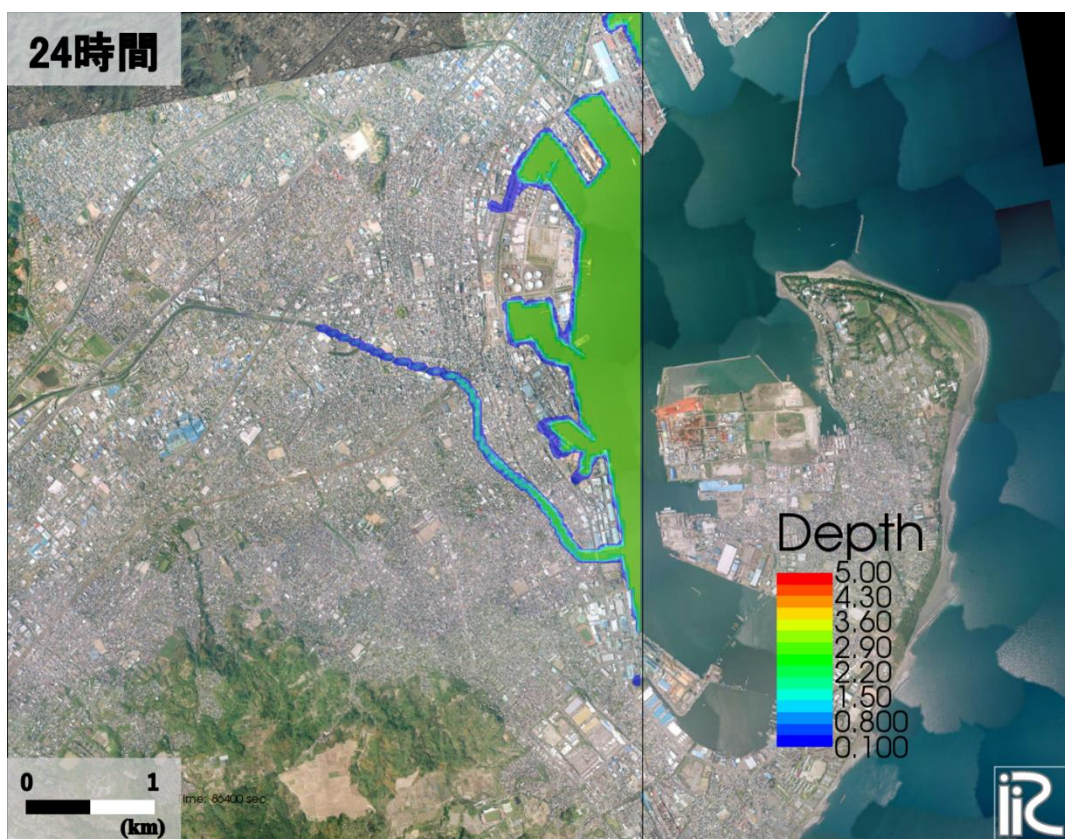
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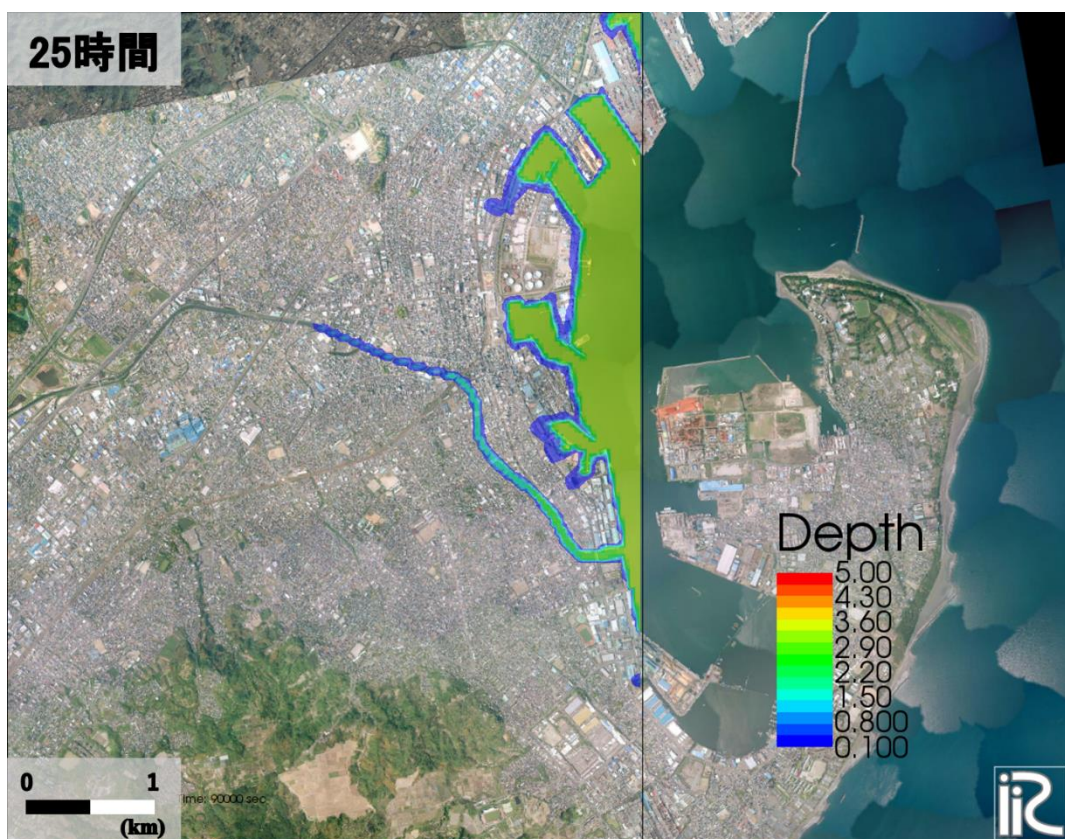
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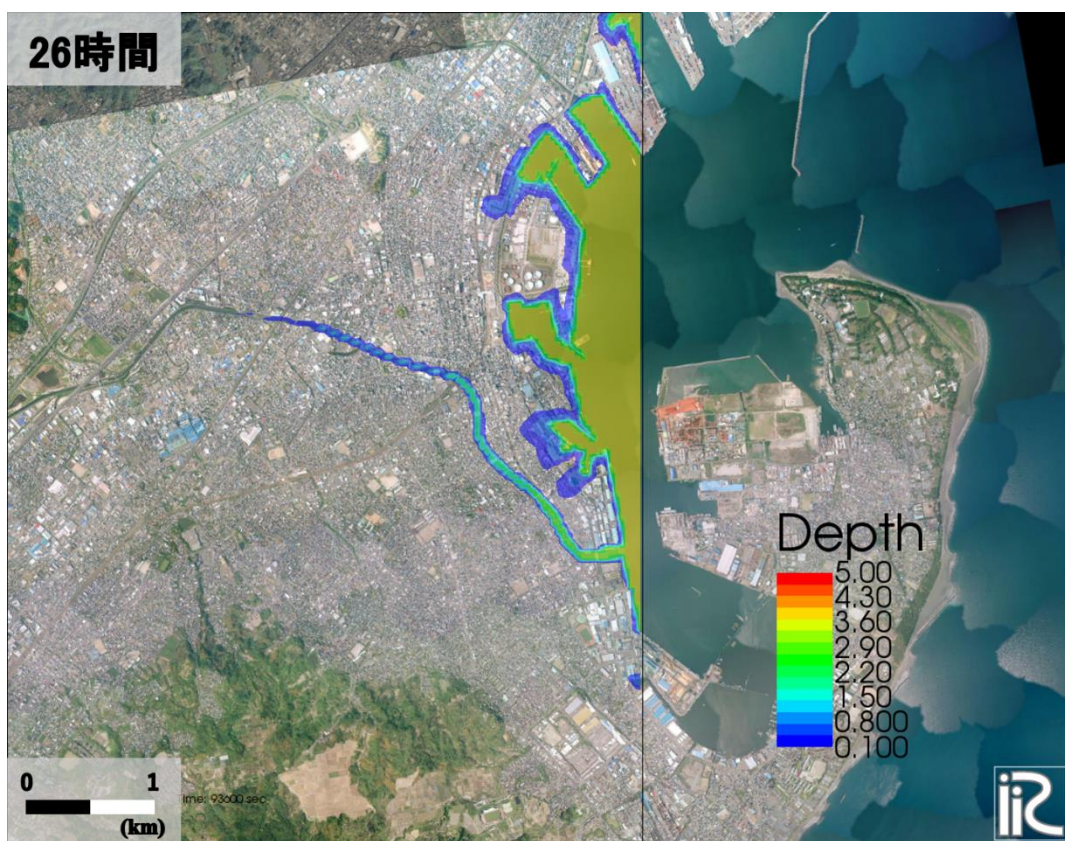
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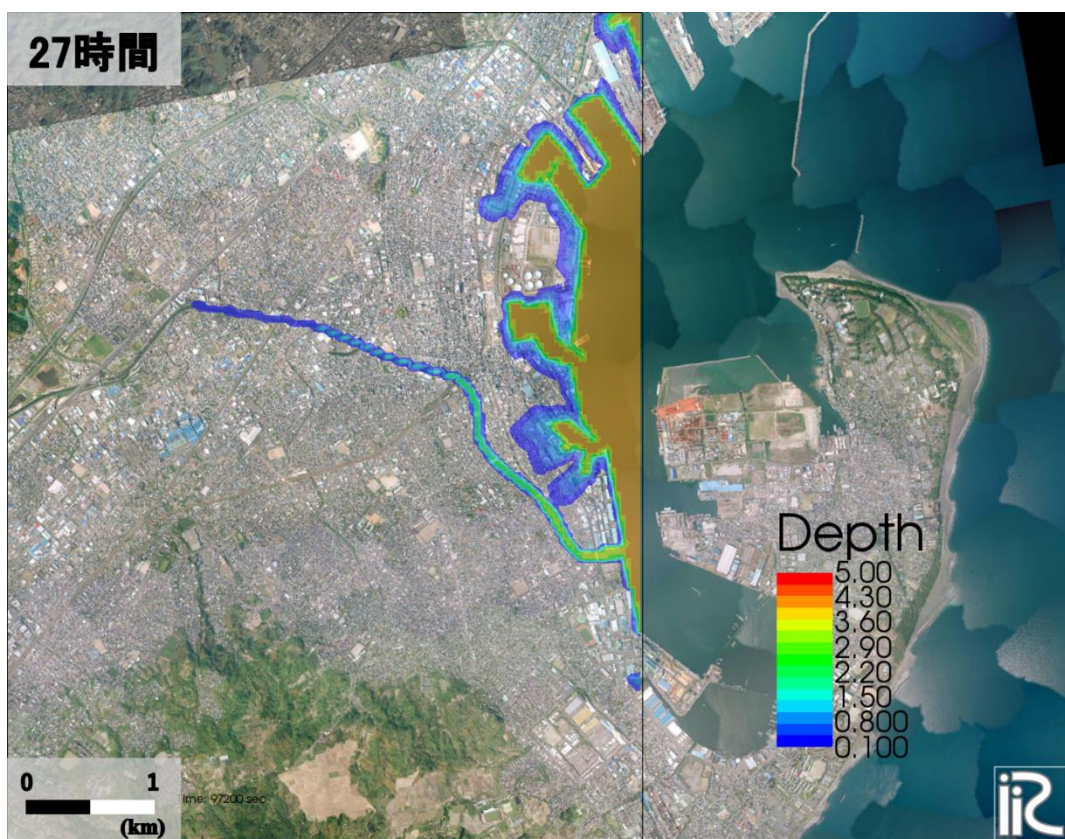
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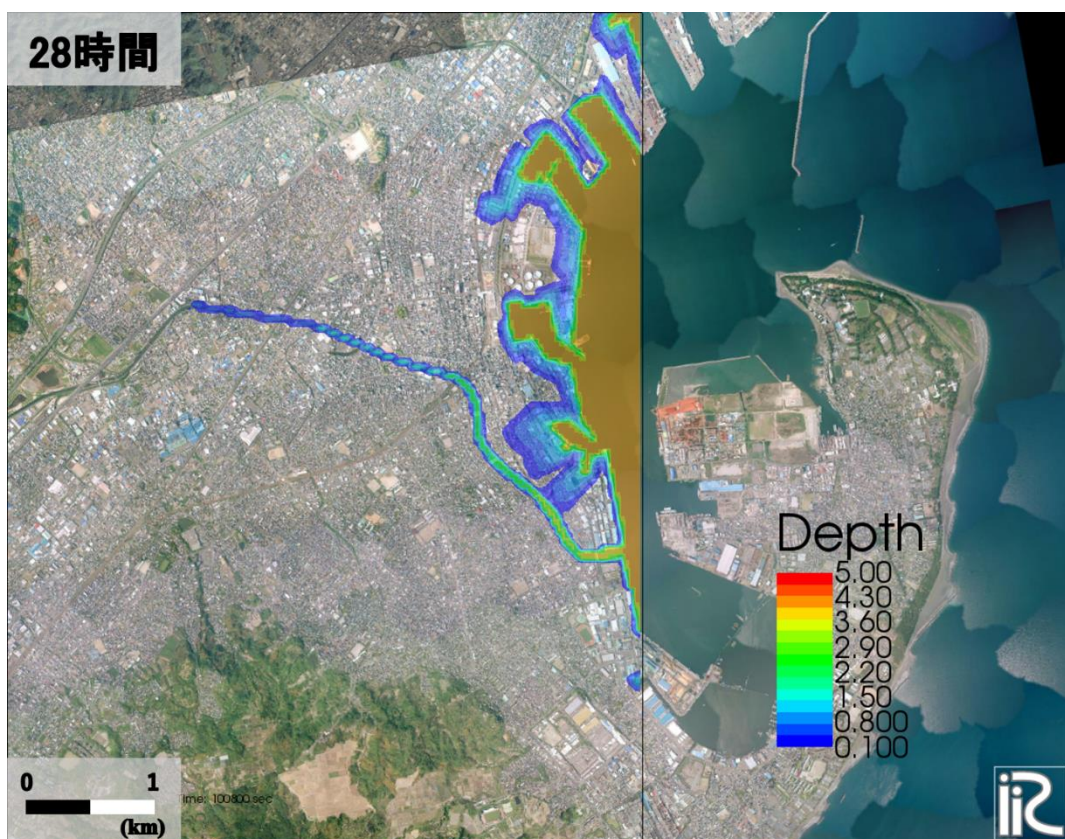
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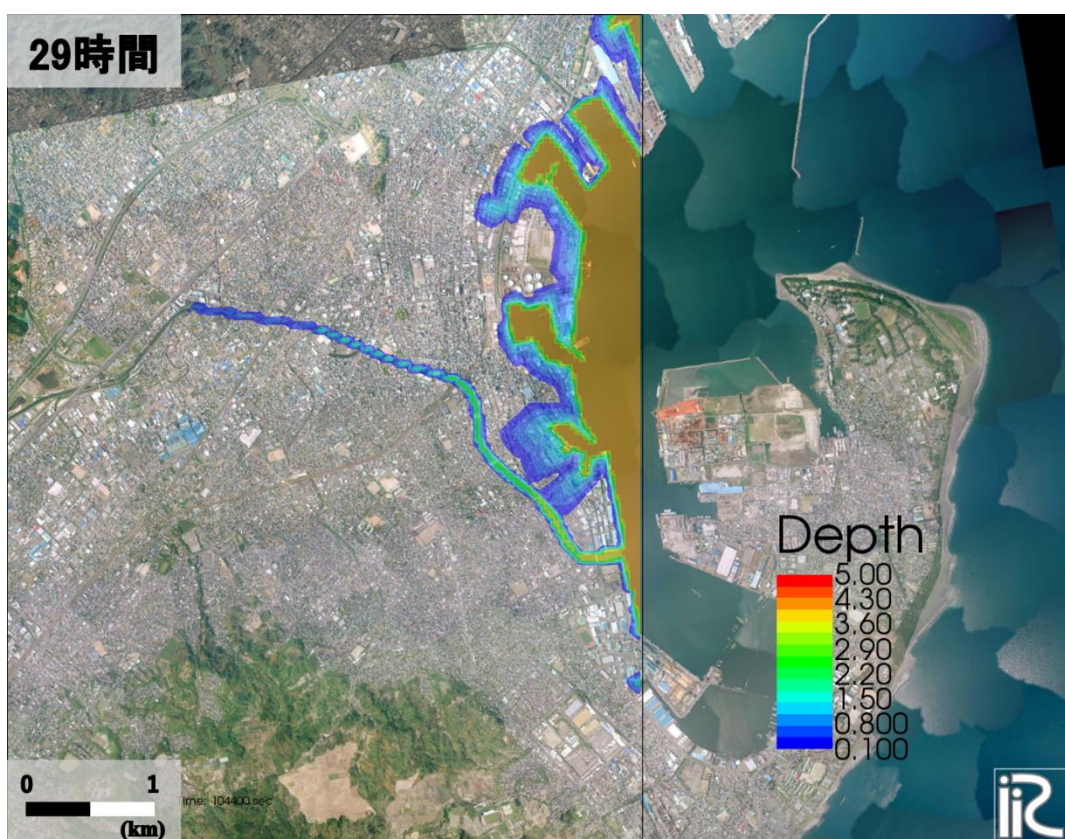
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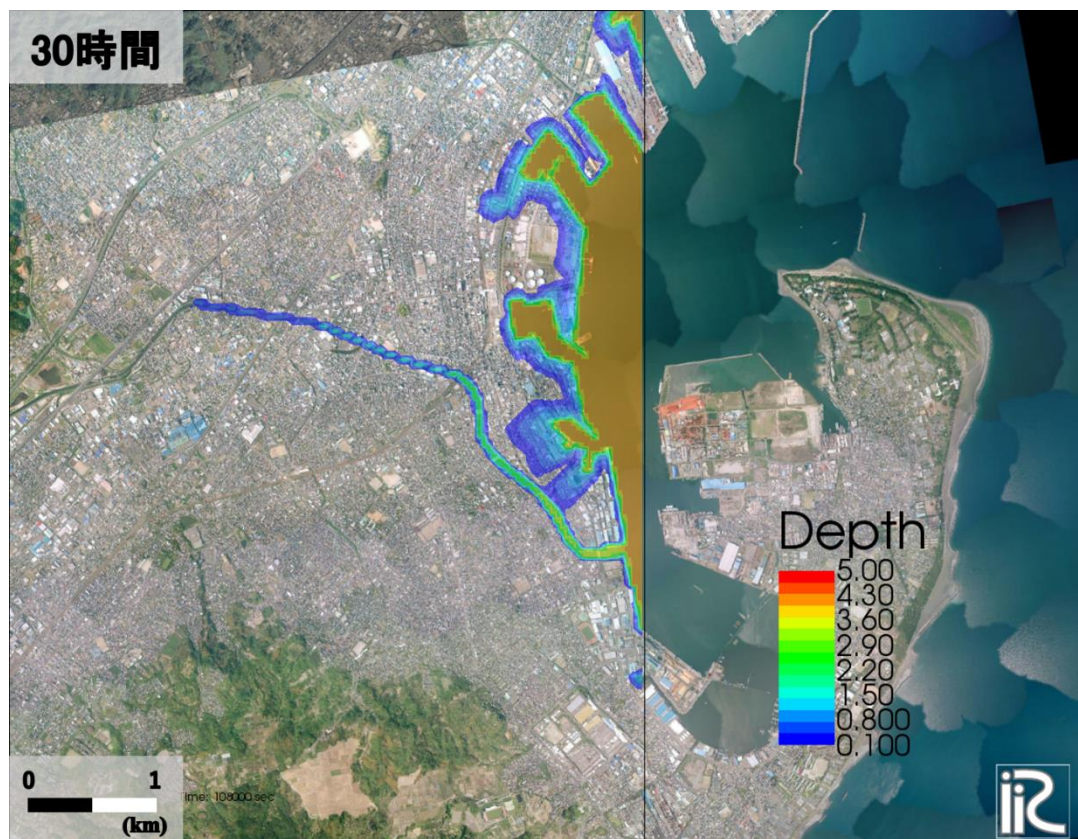
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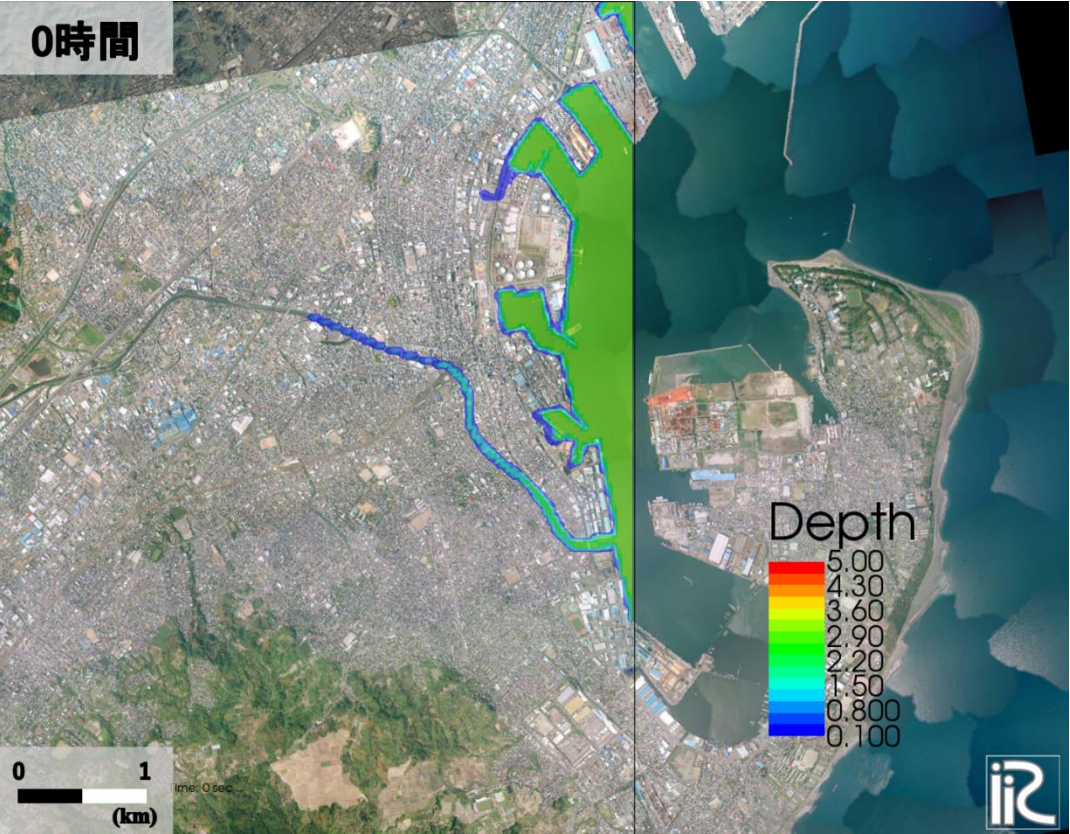
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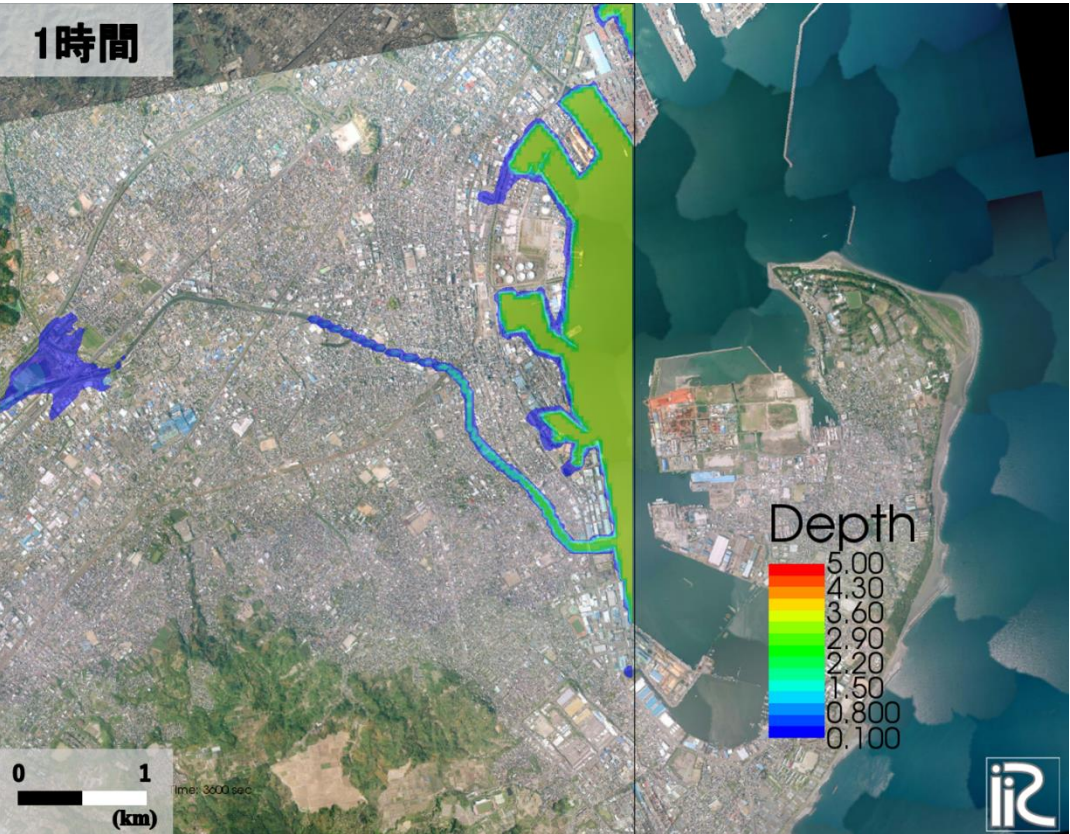
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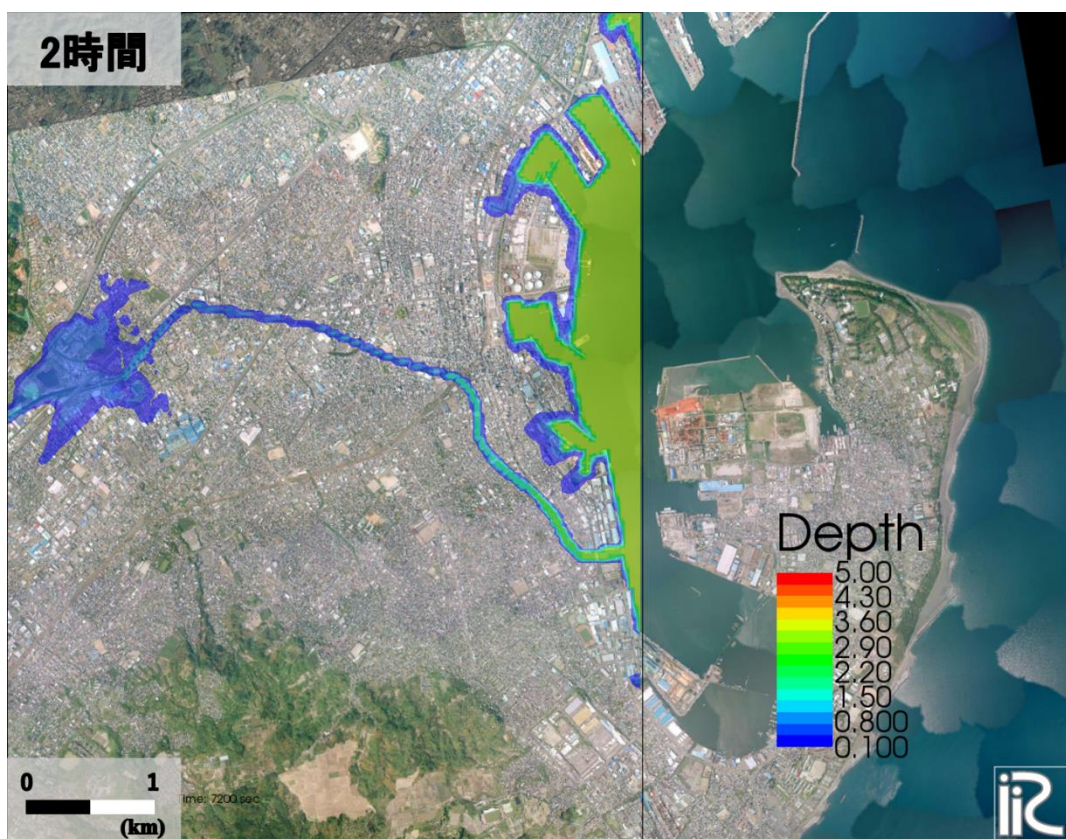
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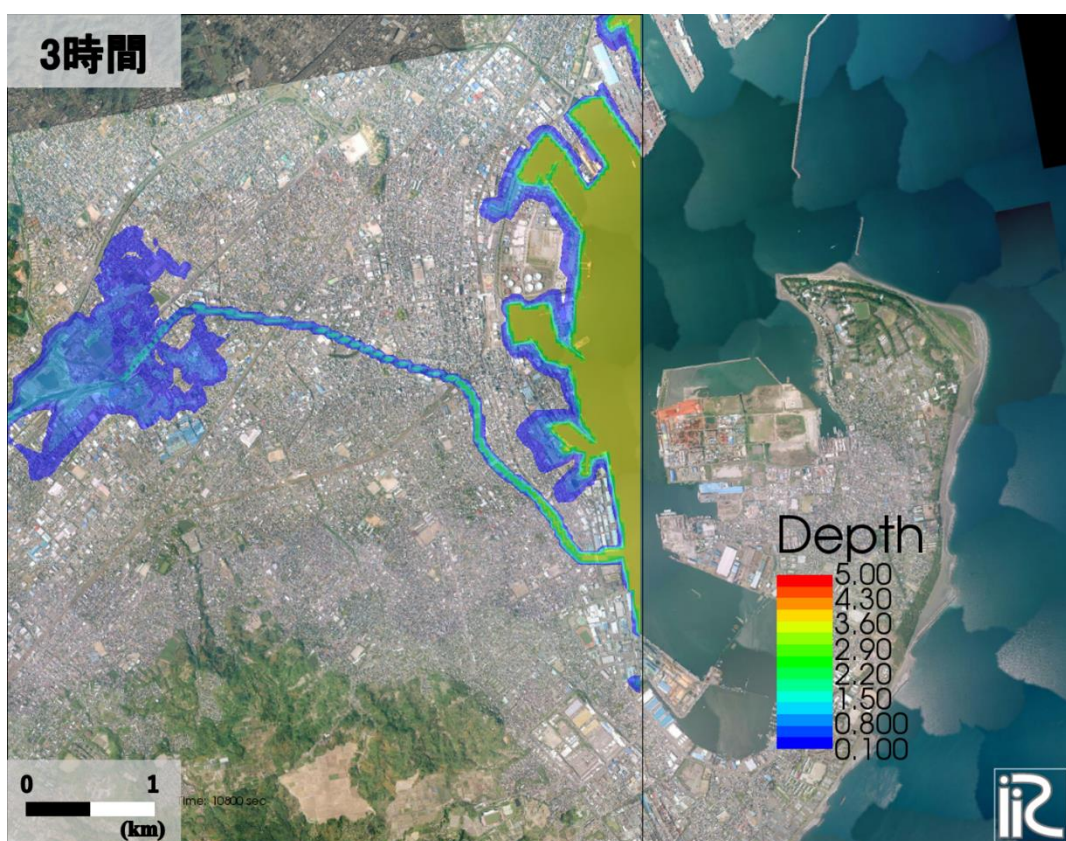
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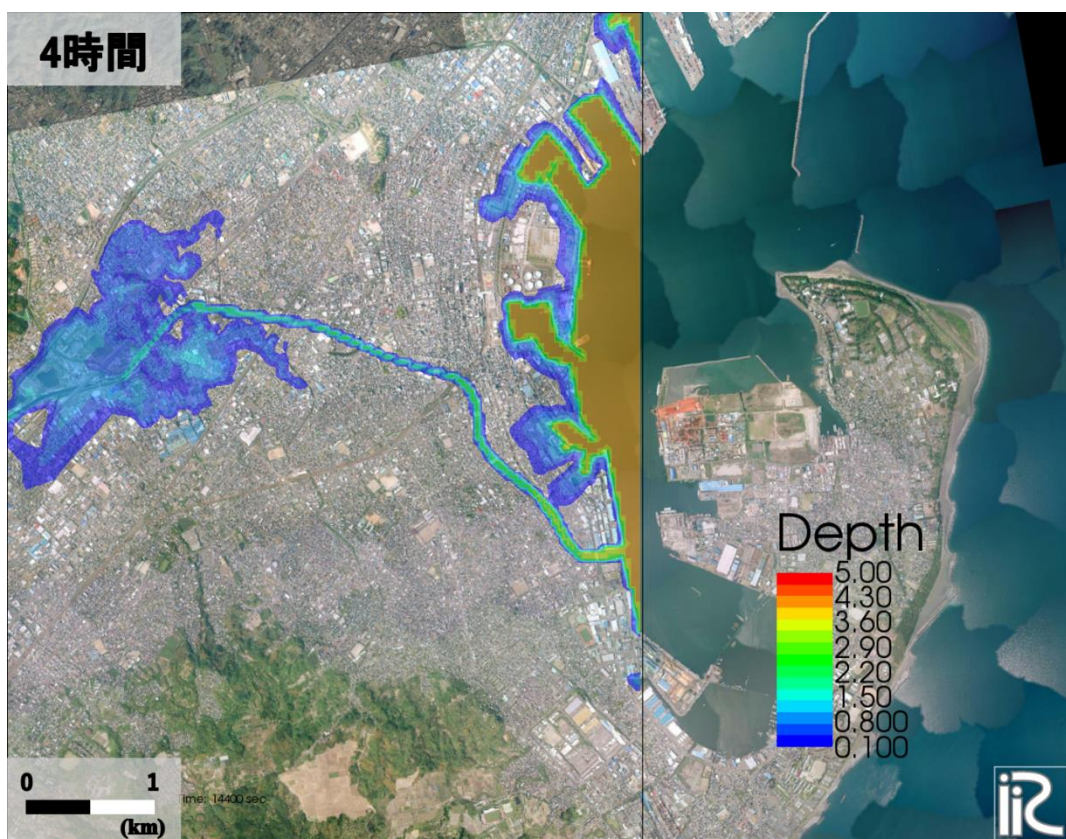
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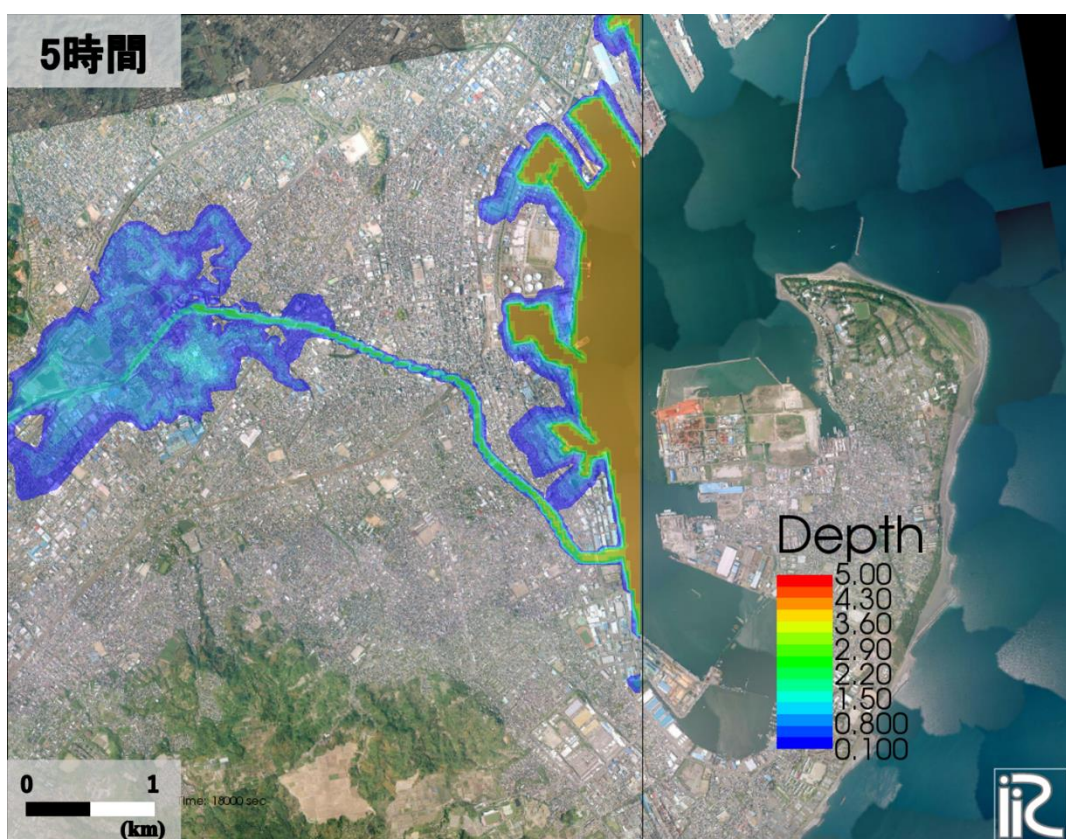
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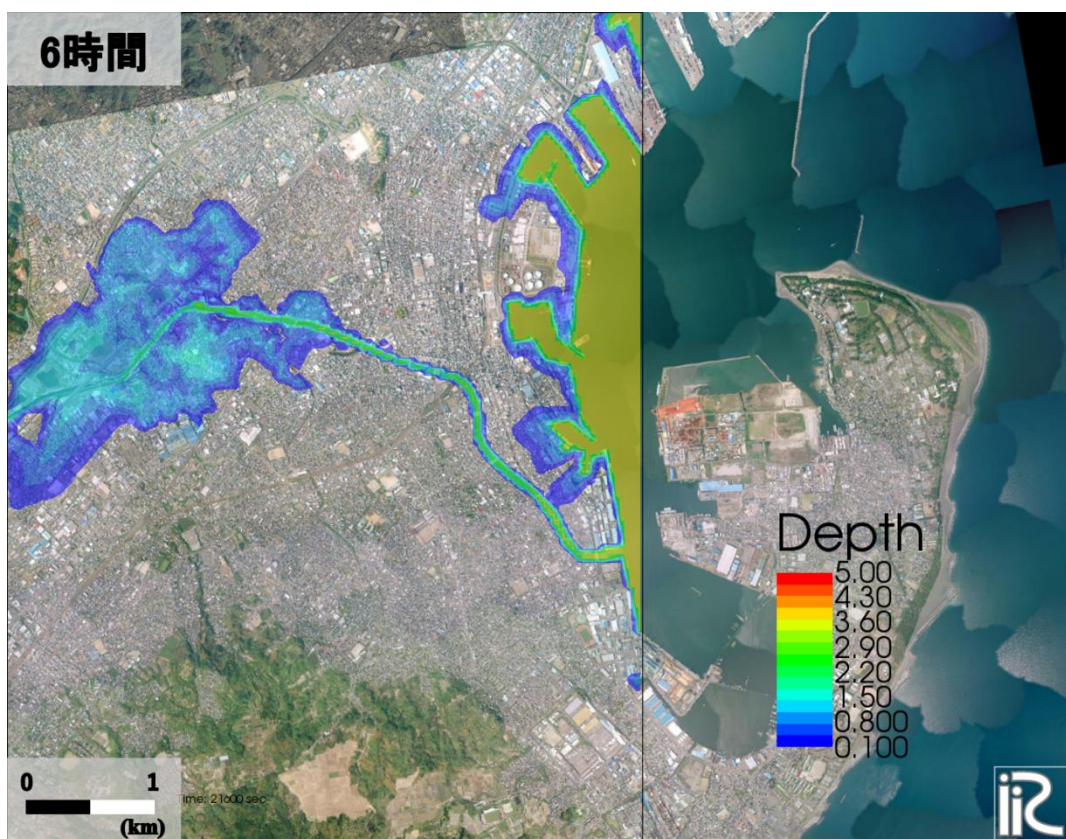
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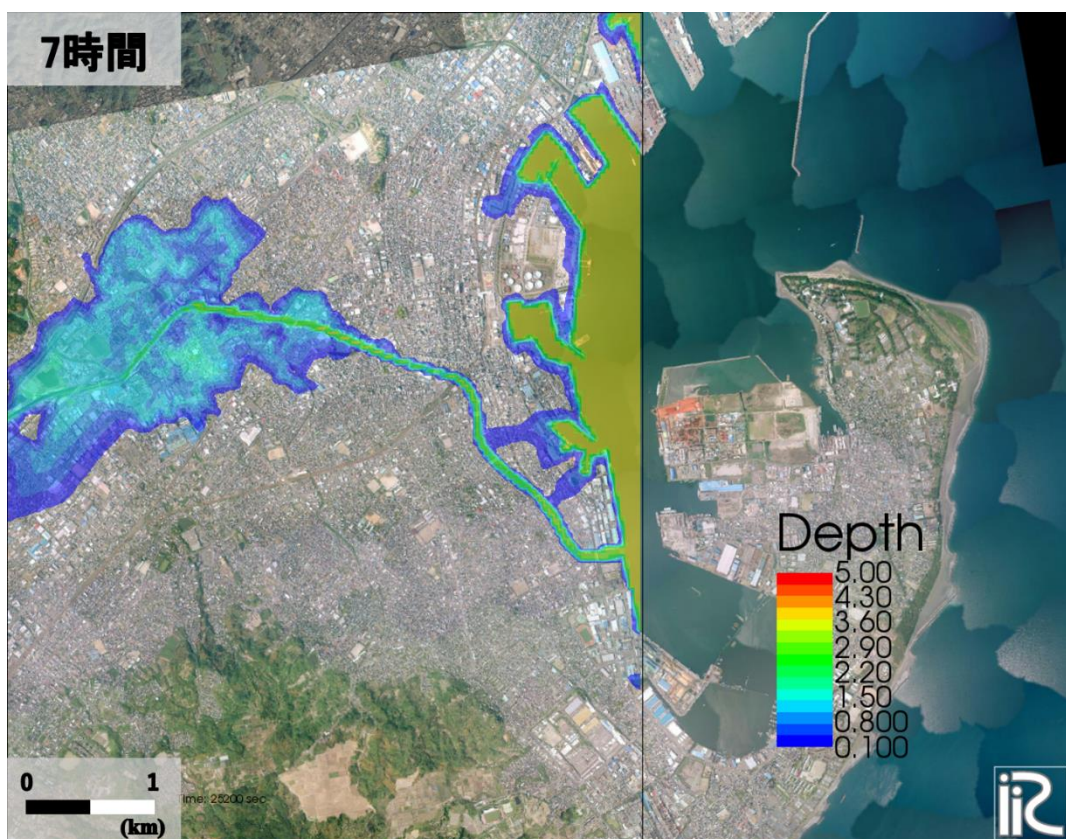
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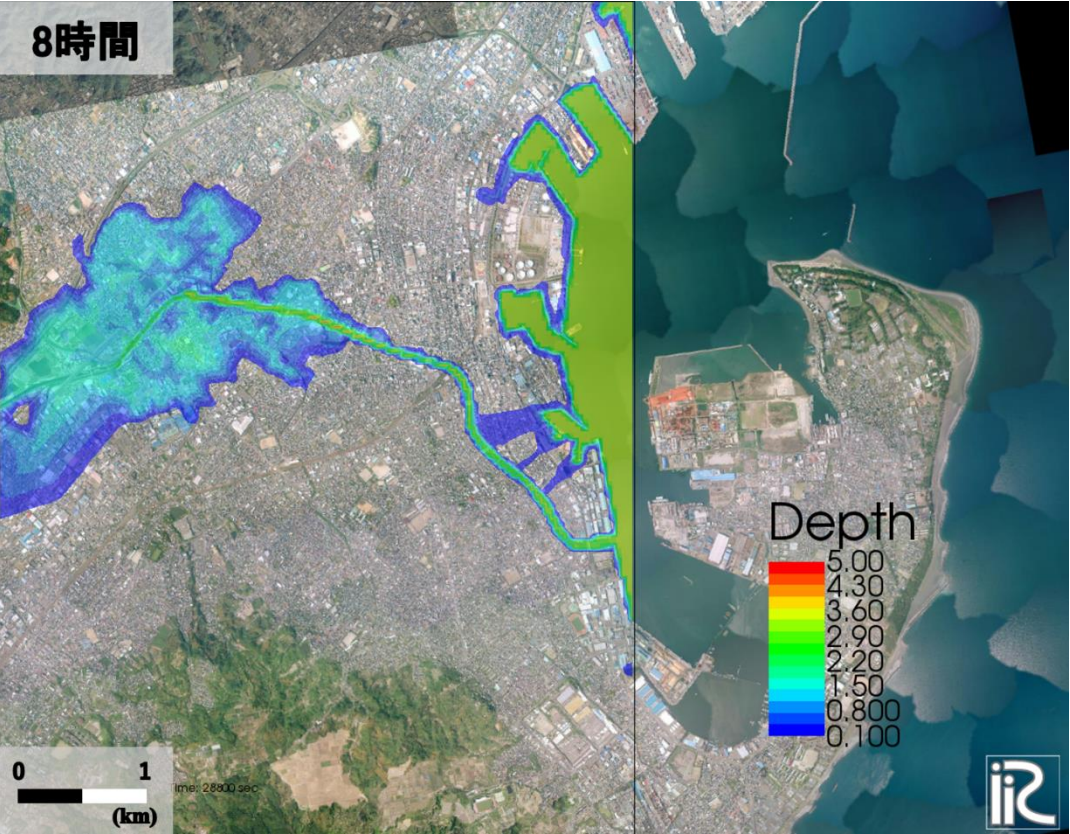
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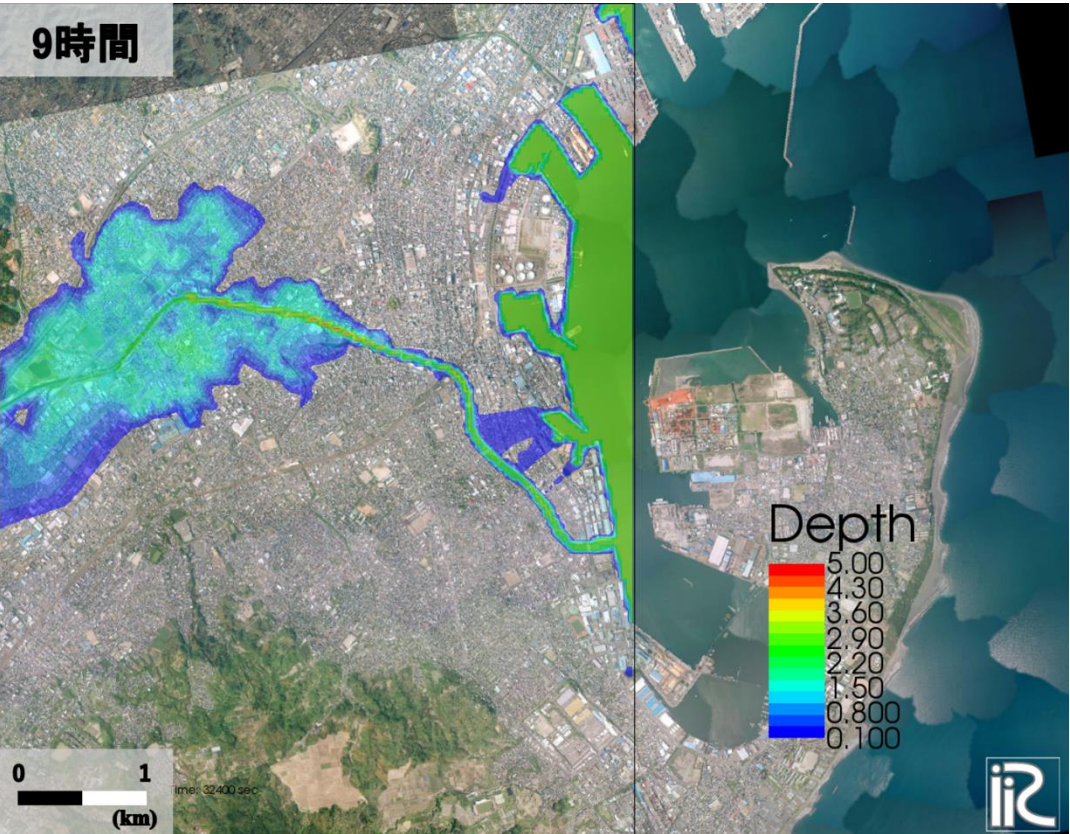
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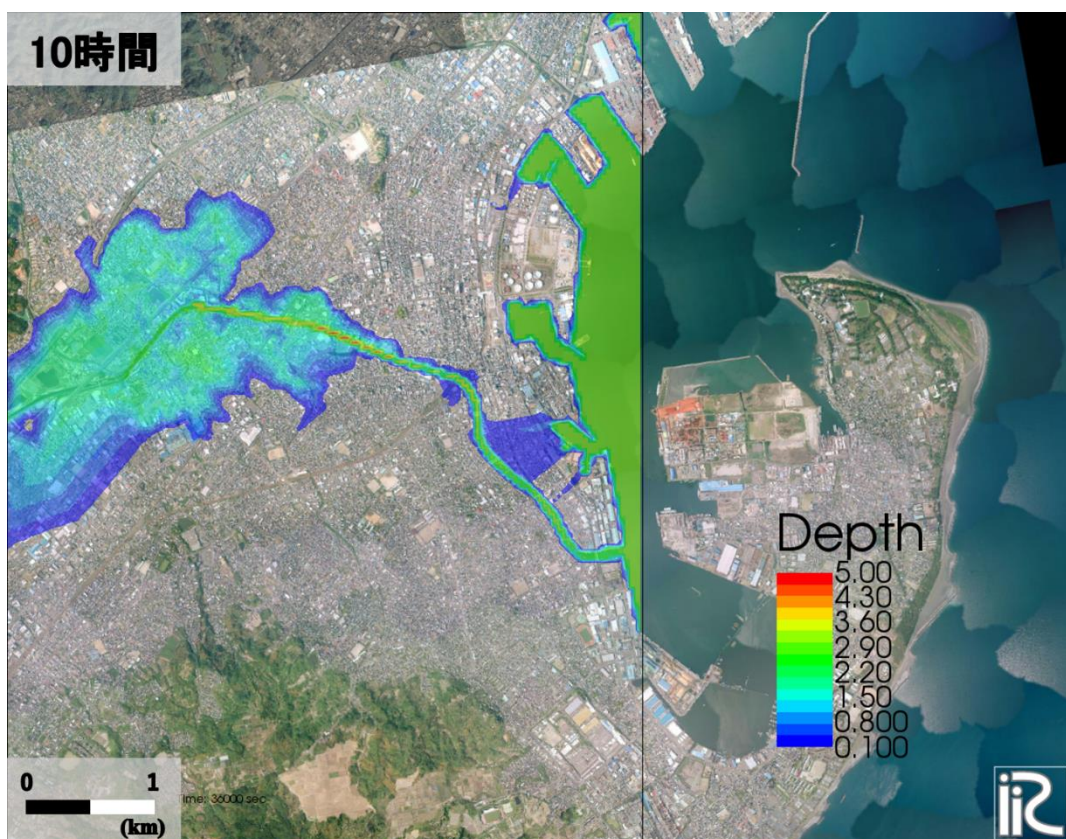
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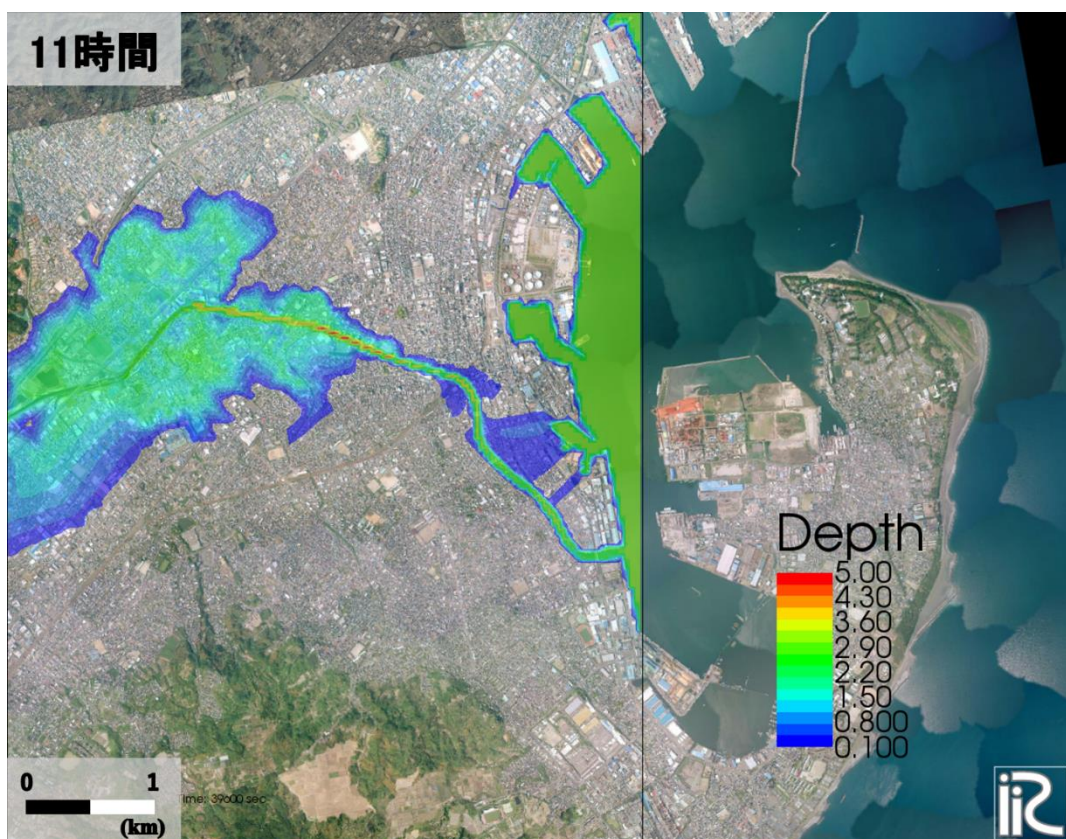
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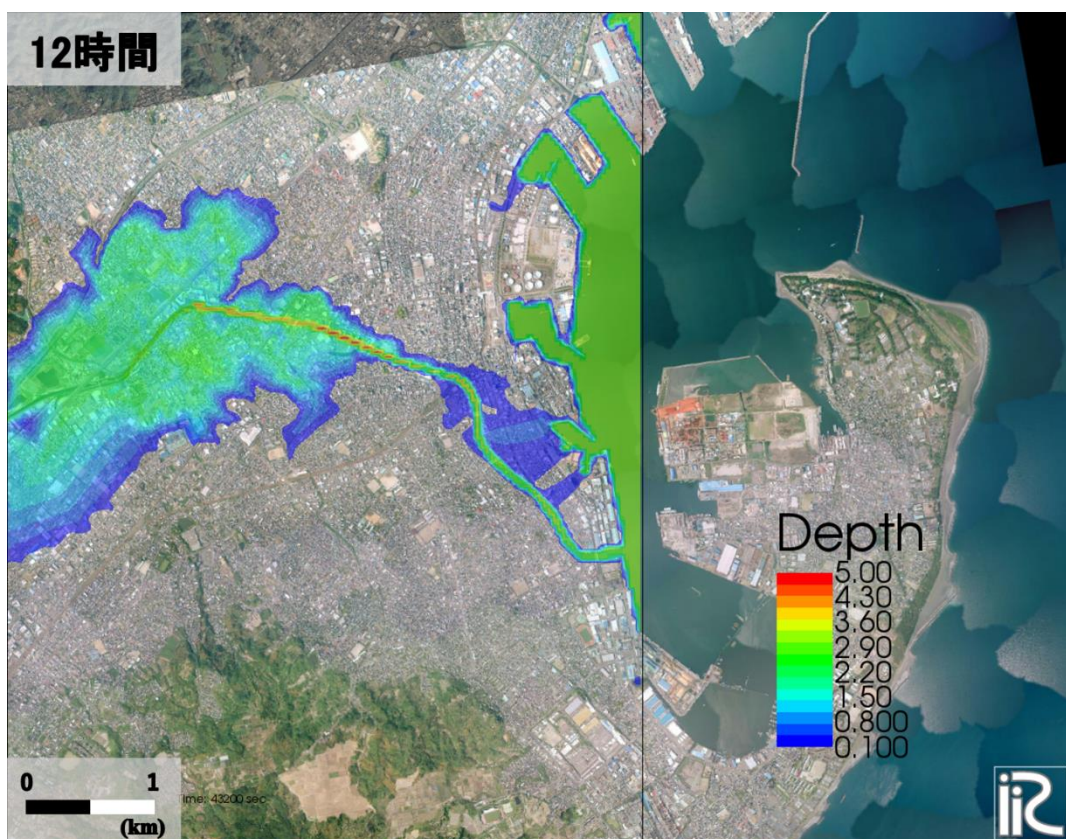
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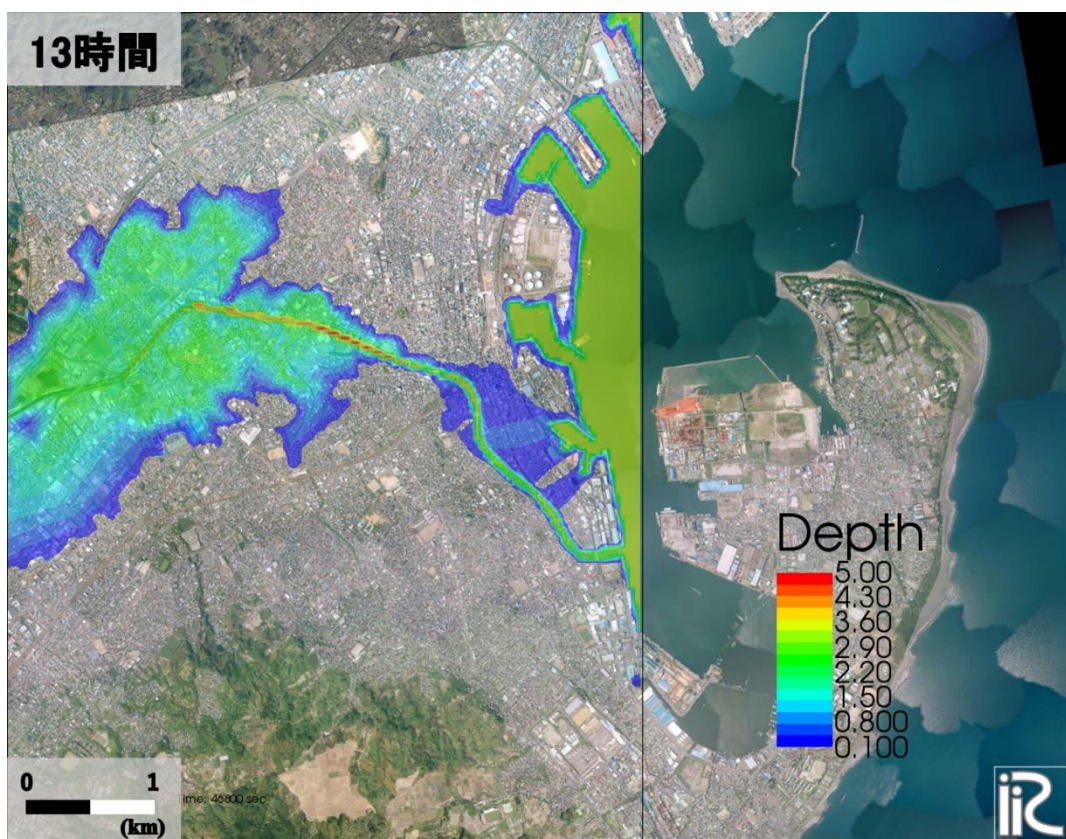
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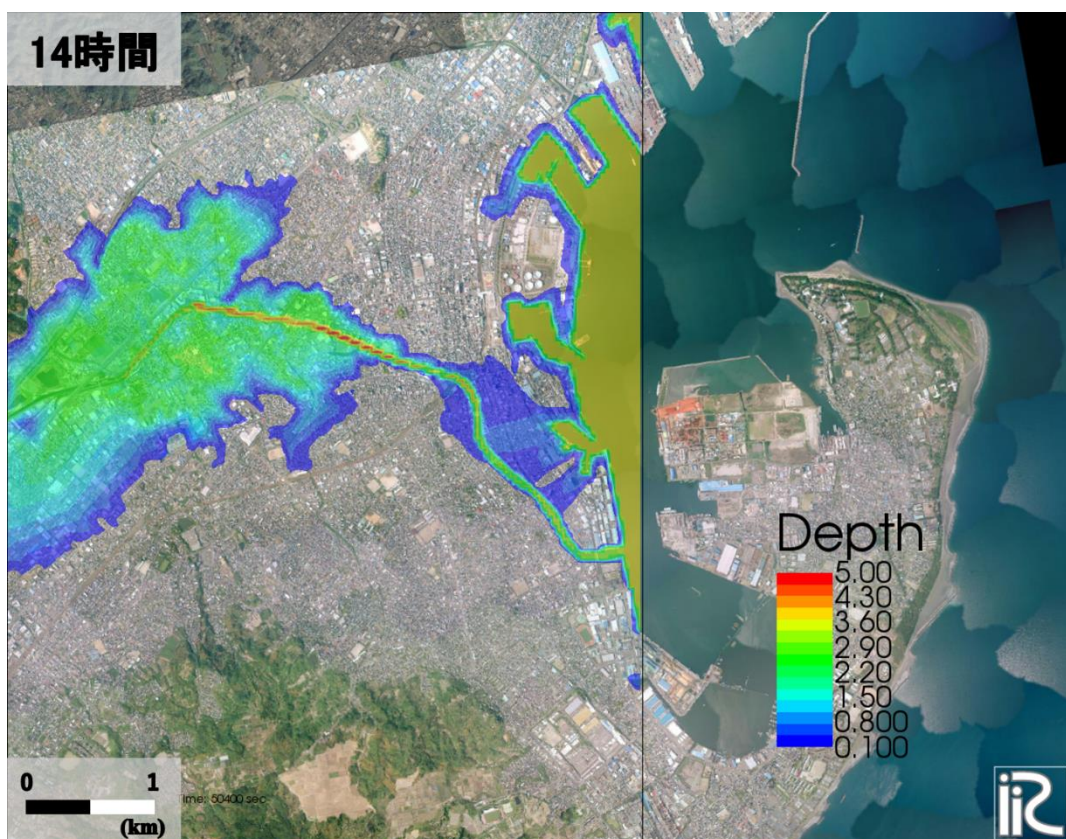
2.7 M

12



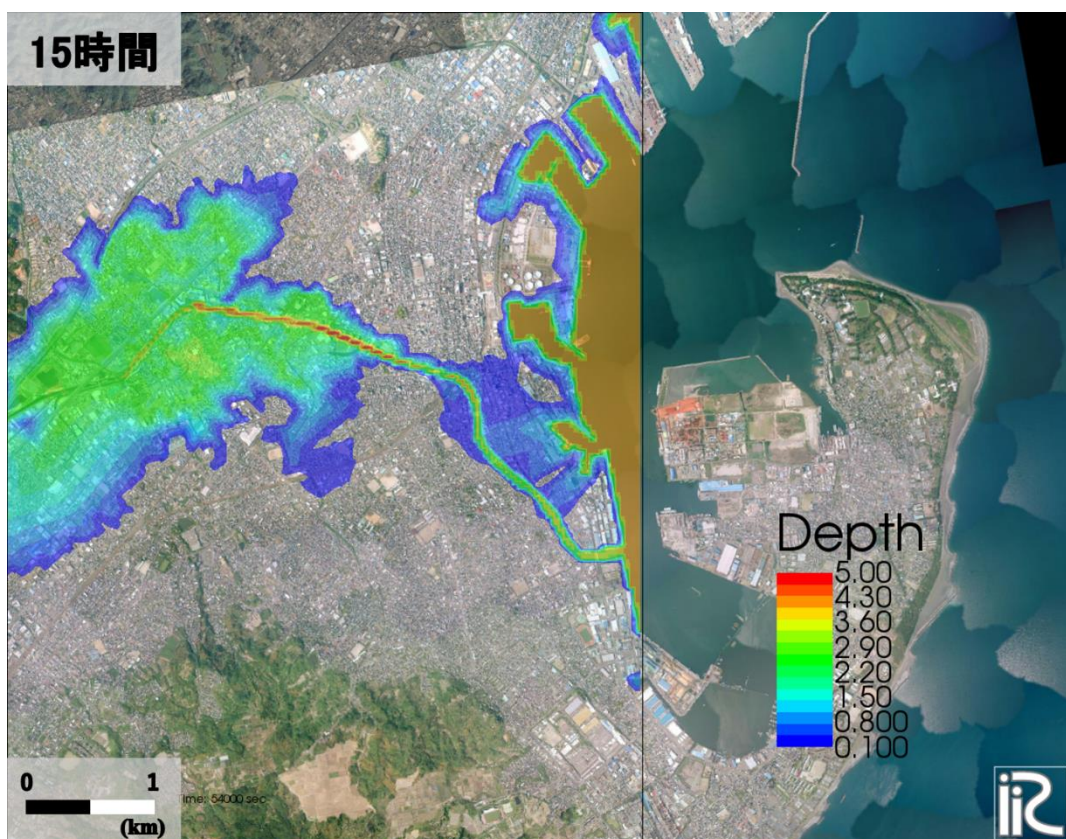
2.7 N

13



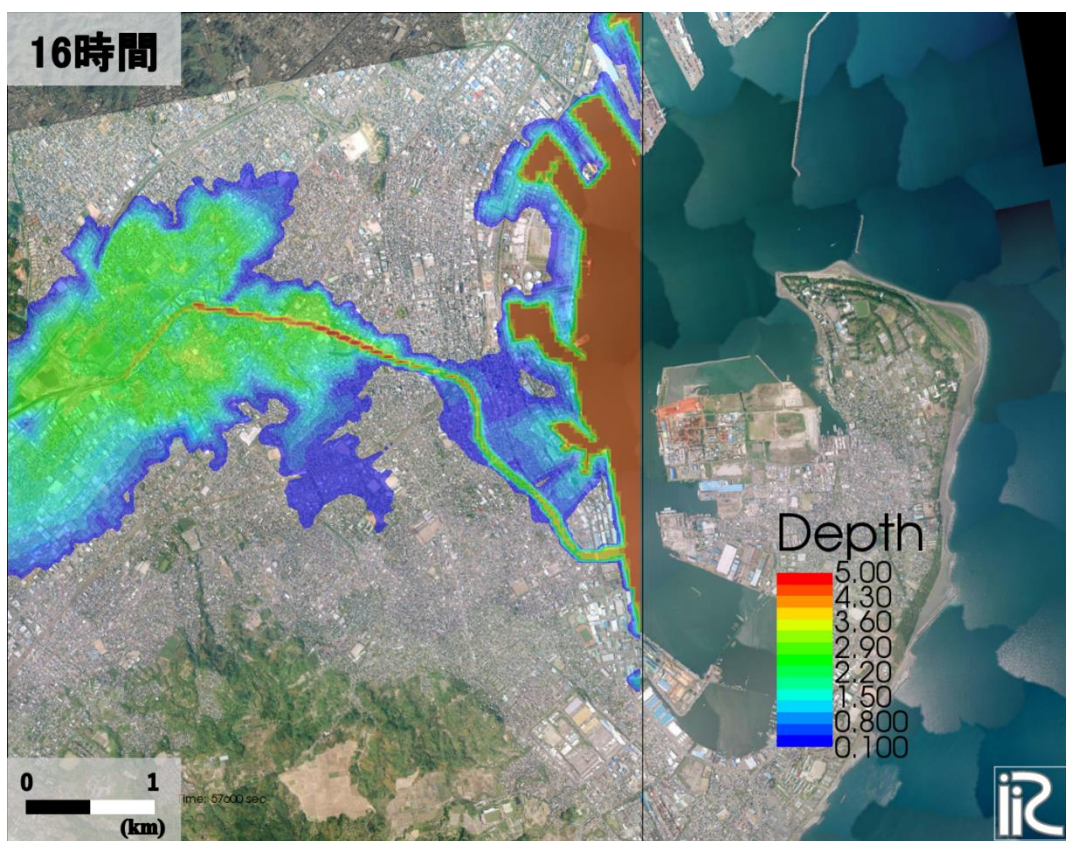
2.7 O

14



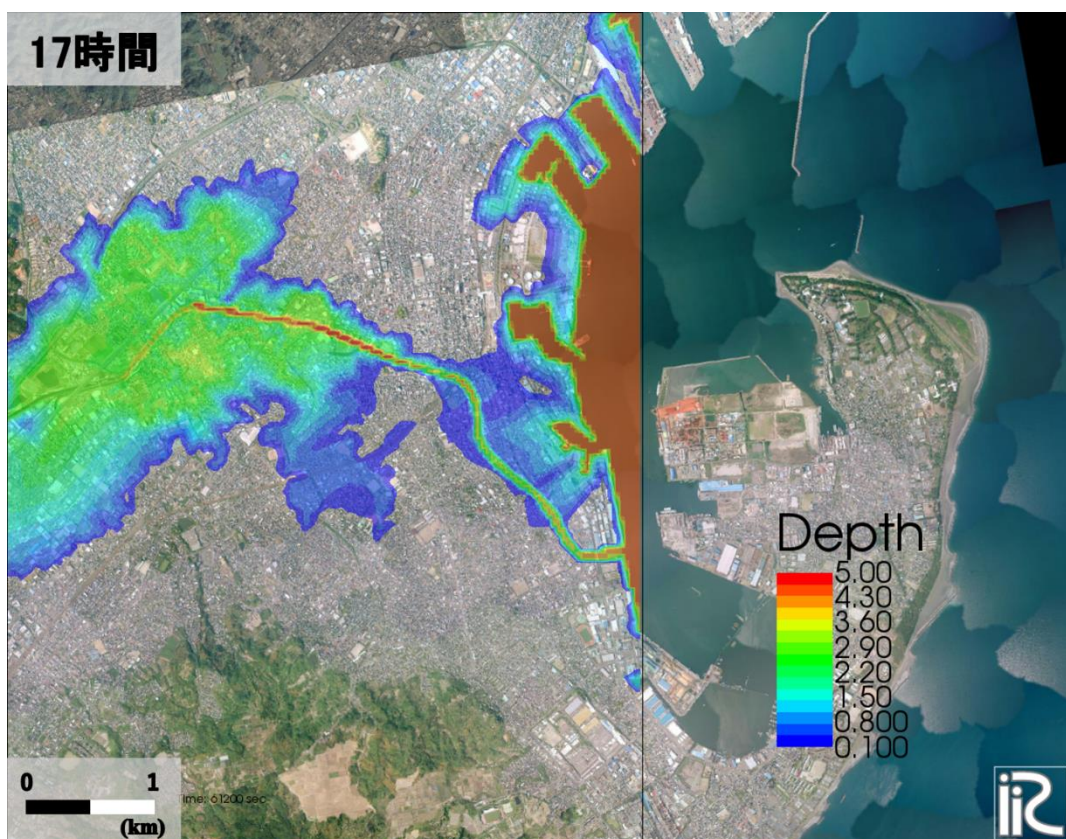
2.7 P

15



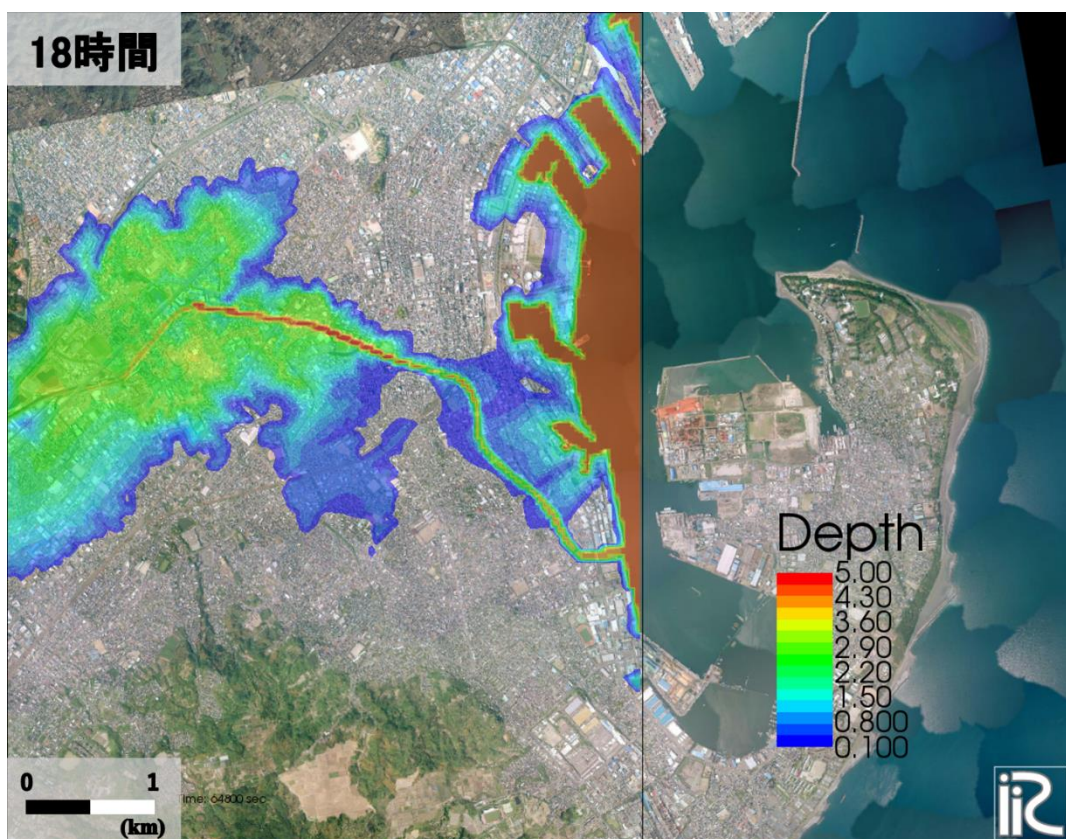
2.7 Q

16



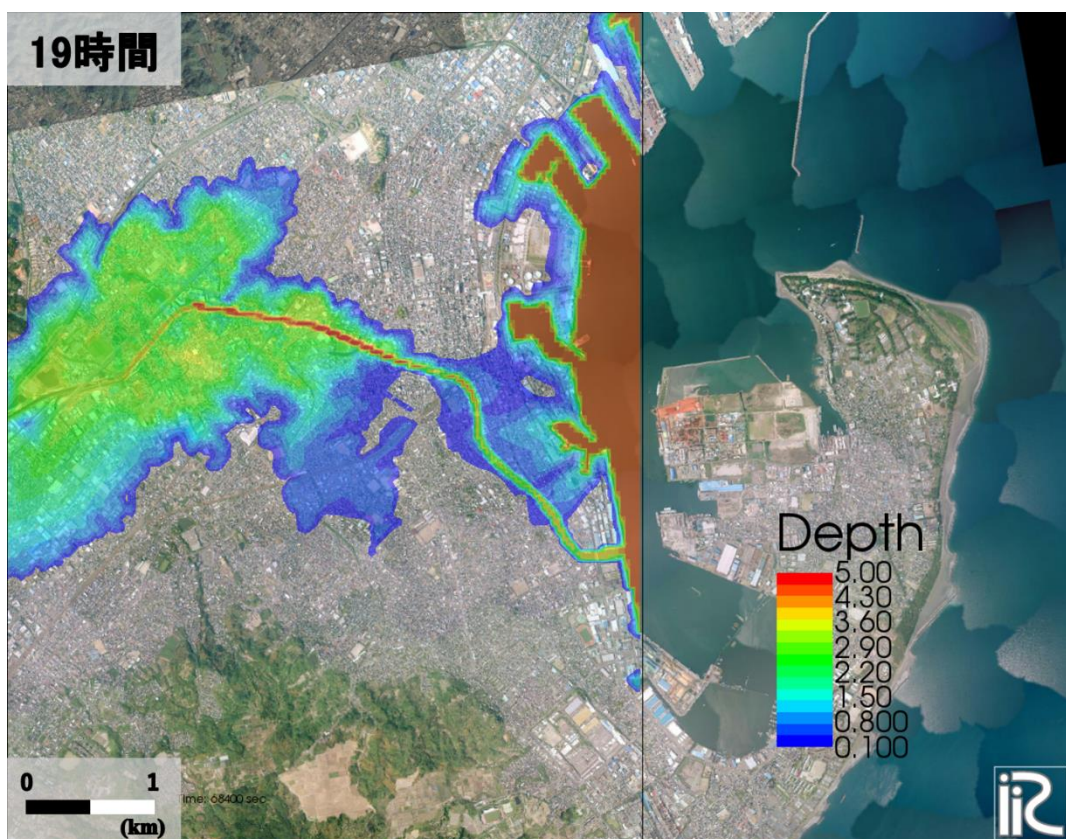
2.7 R

17



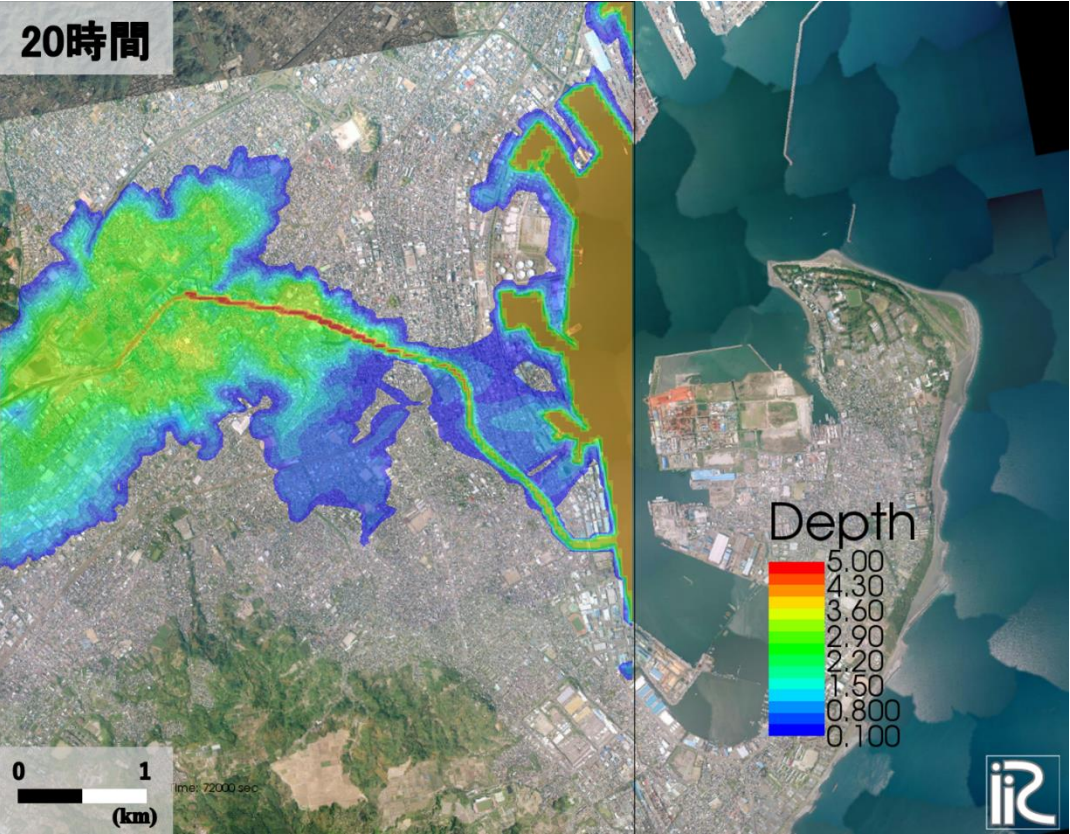
2.7 S

18



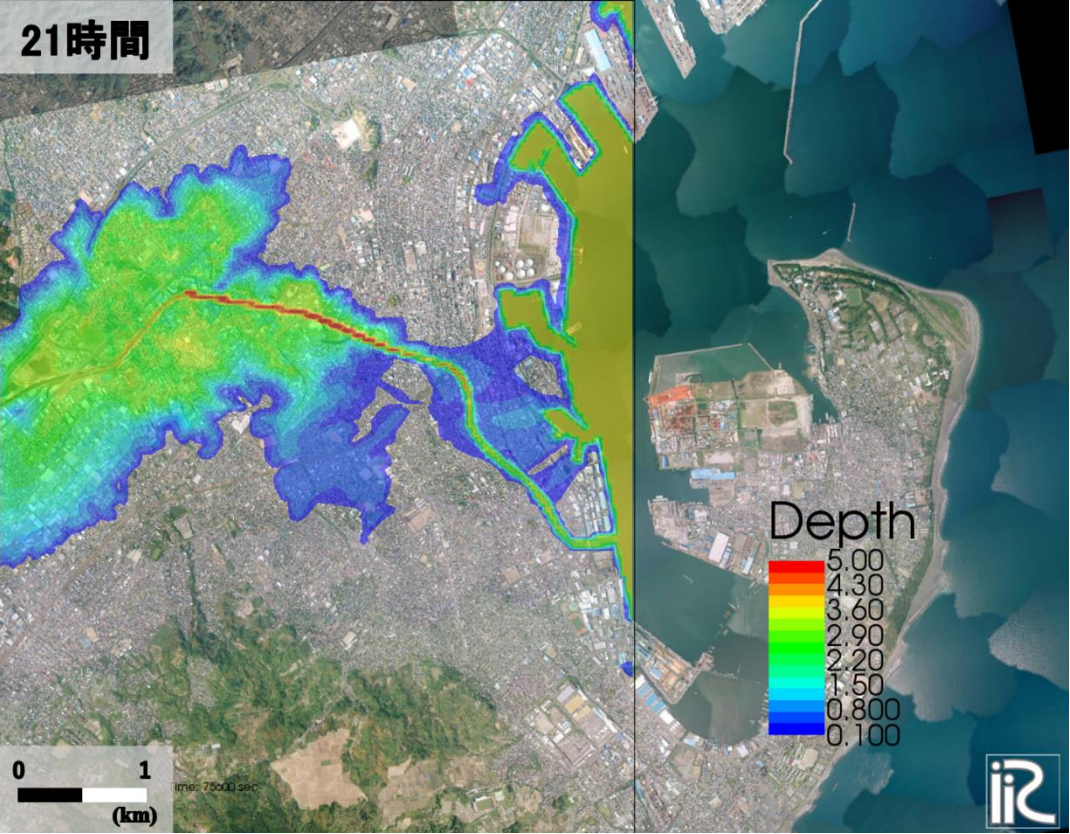
2.7 T

19



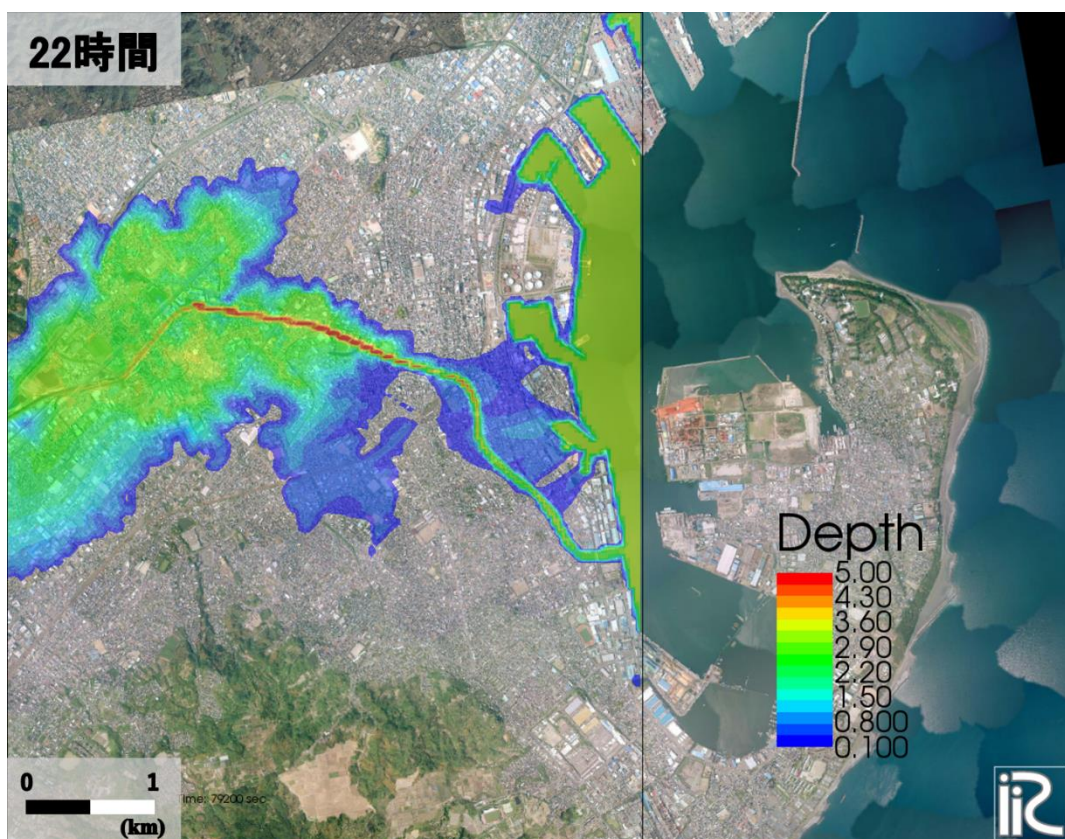
2.7 U

20



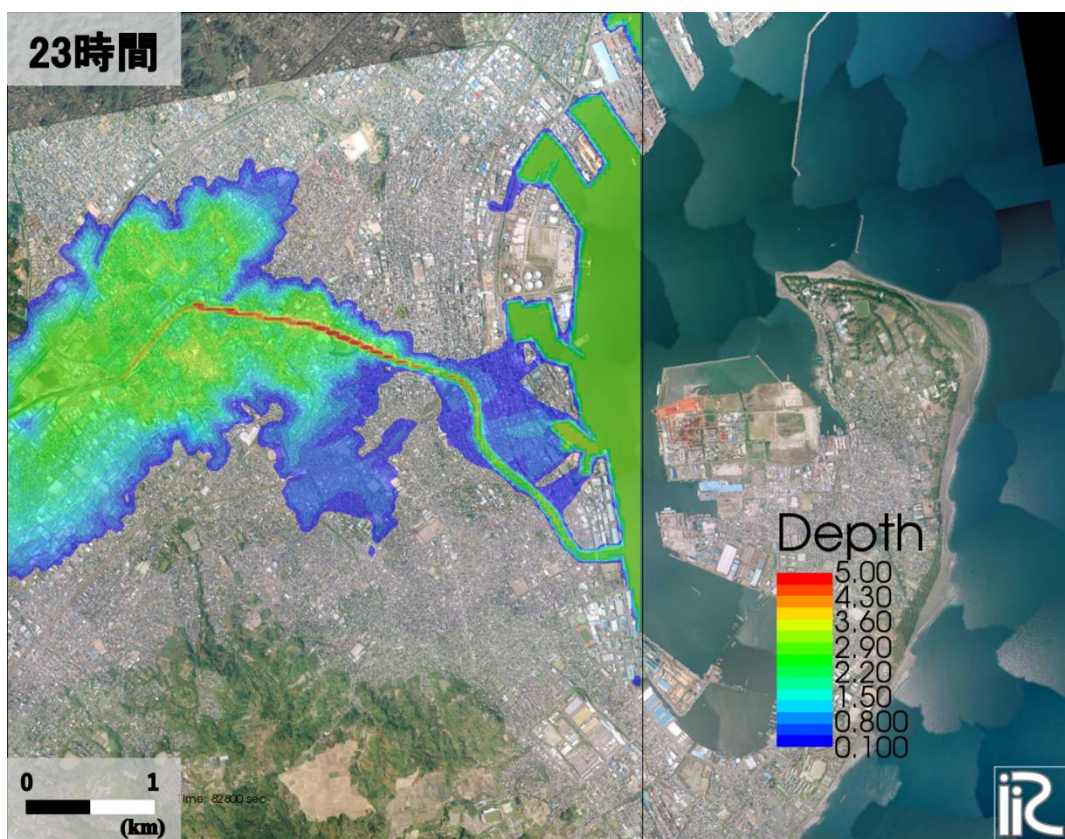
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21



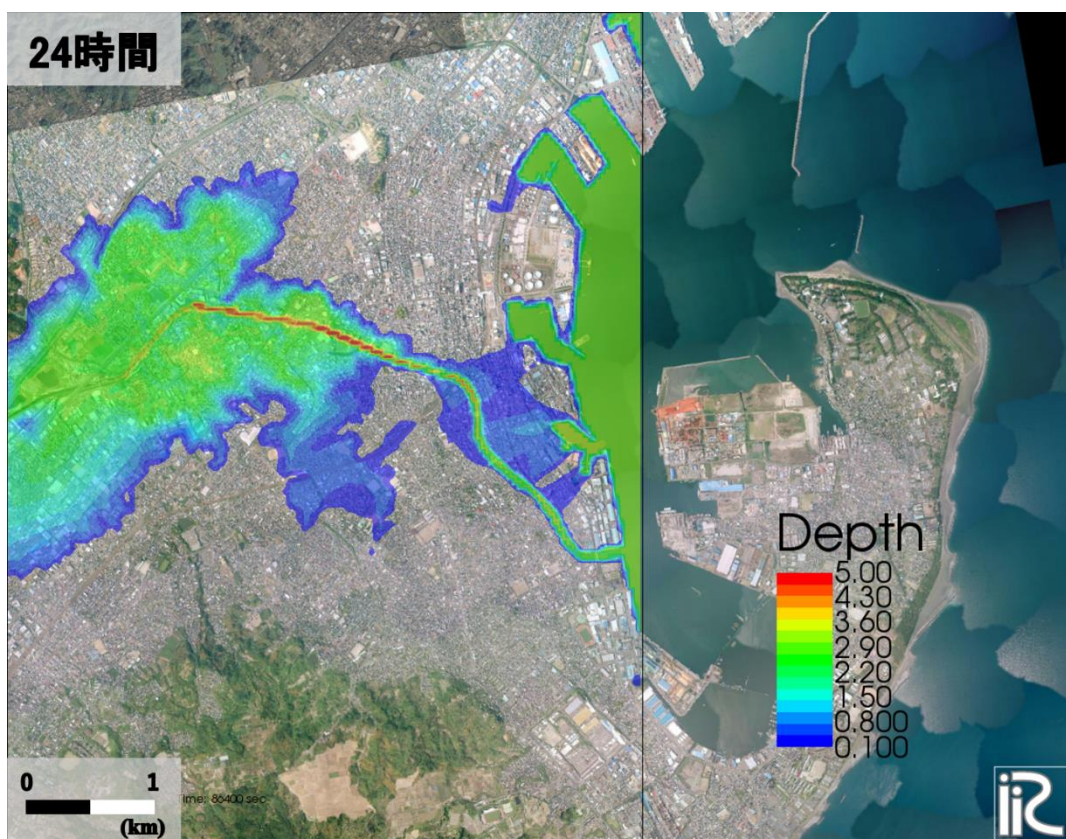
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22



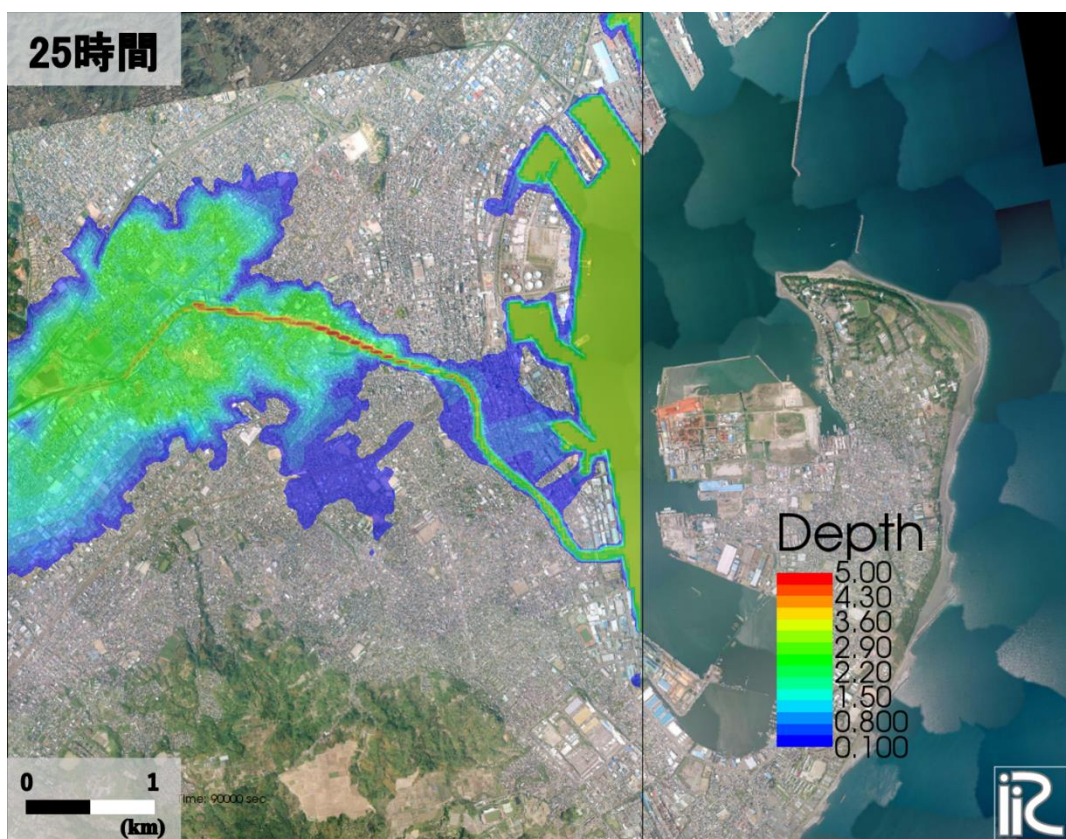
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23



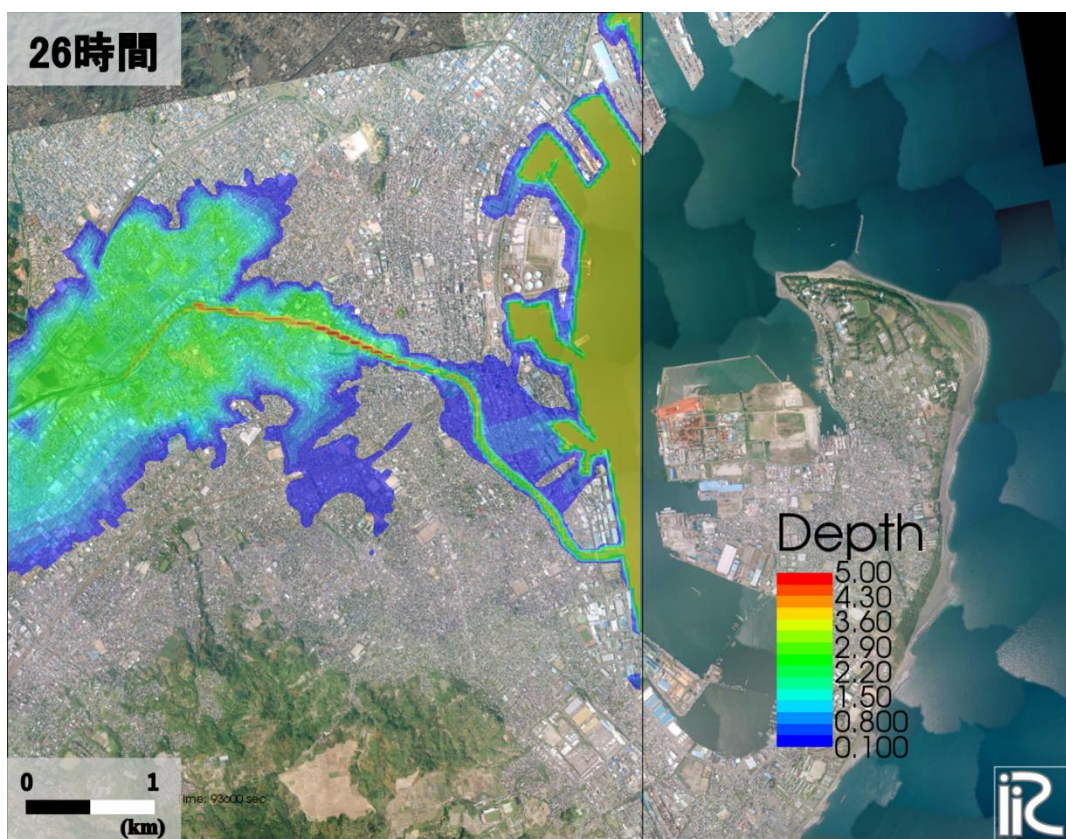
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24



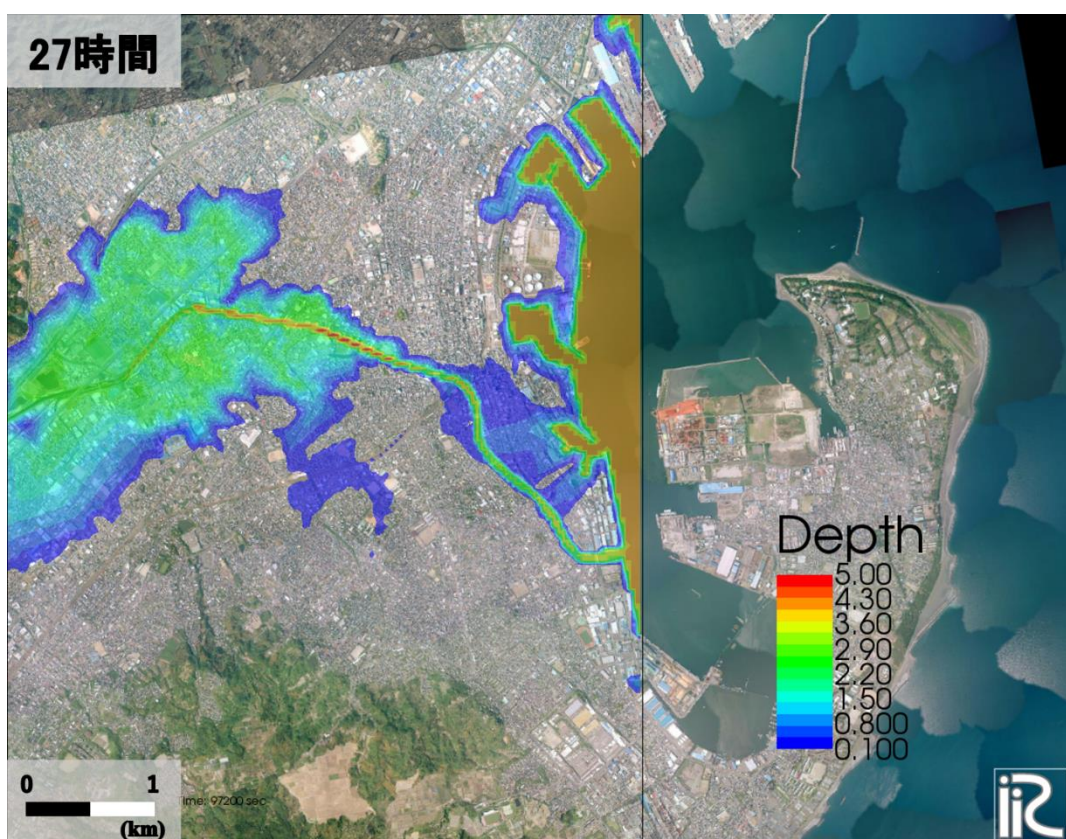
2.7 Z

25



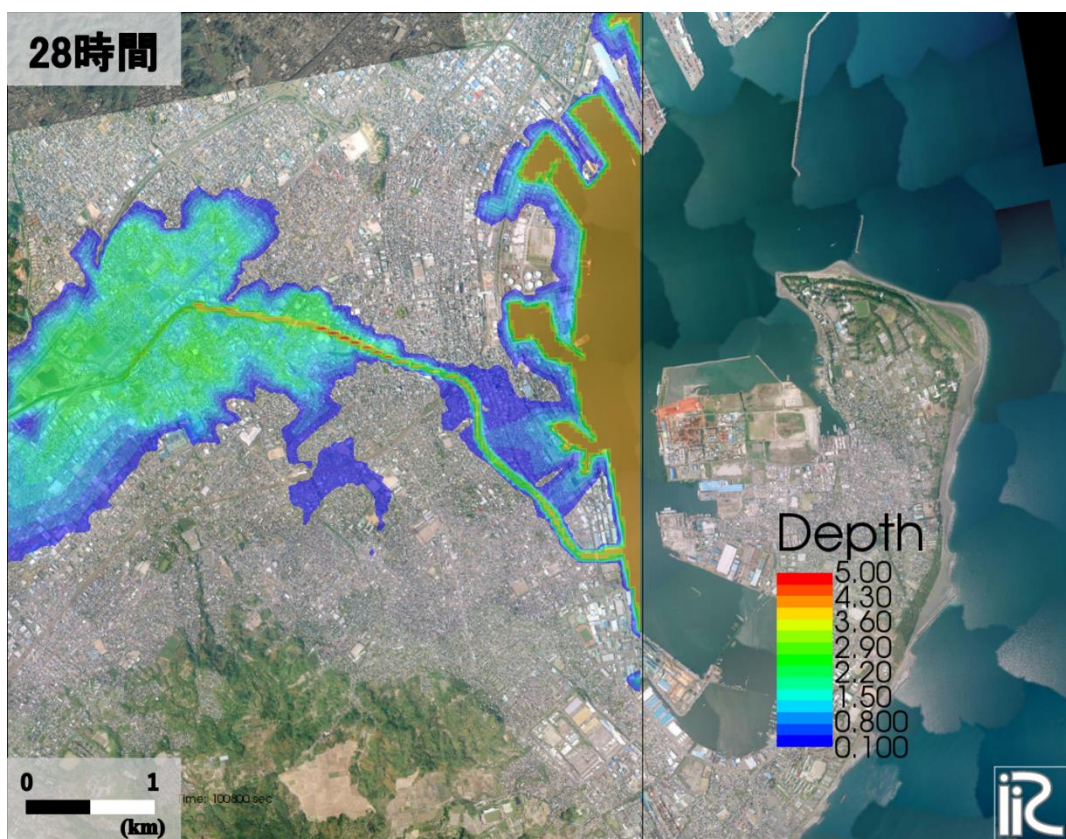
2.7 a

26



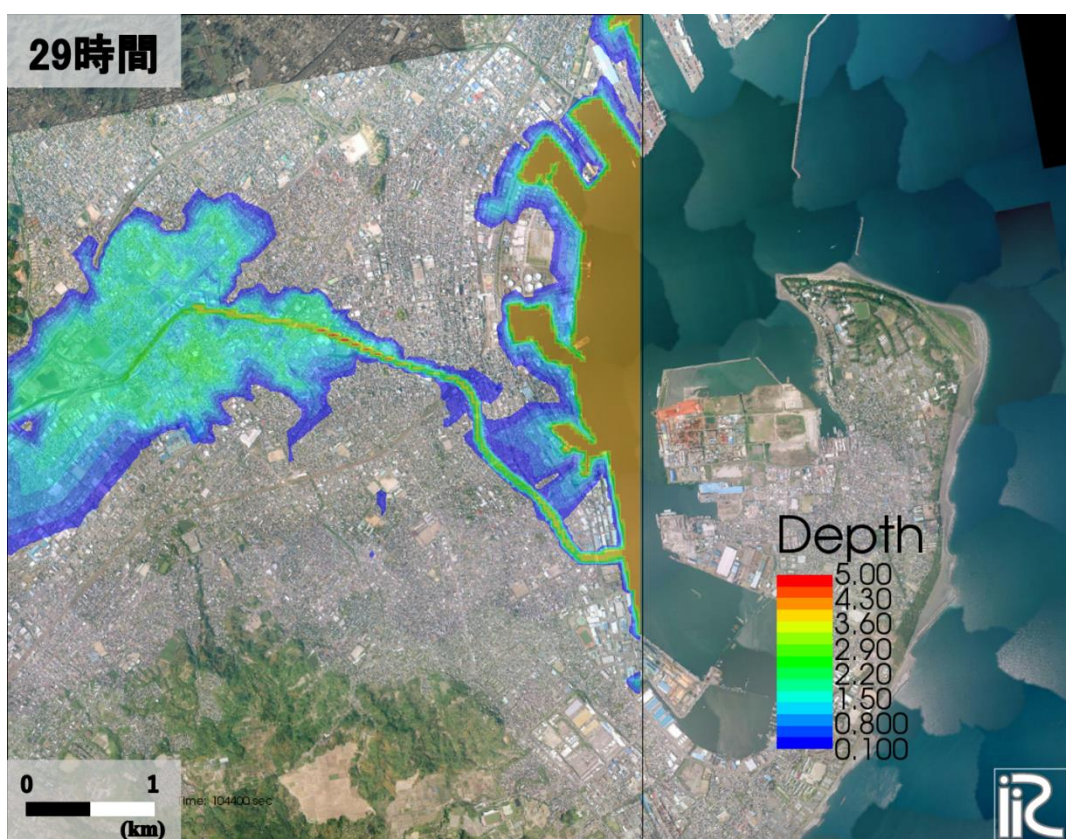
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27



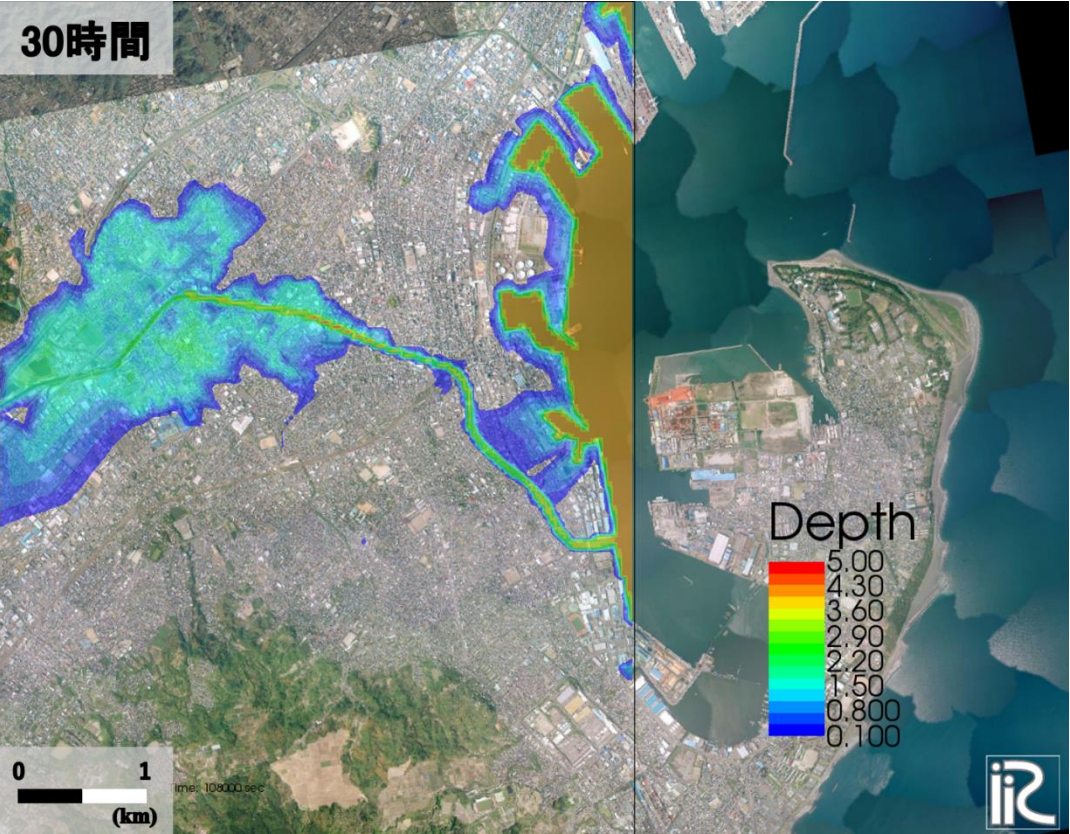
2.7 c

28



2.7 d

29



2.7 e

30

2 6 5

2.5 A

2.5 e

2.7 A

2.7 e

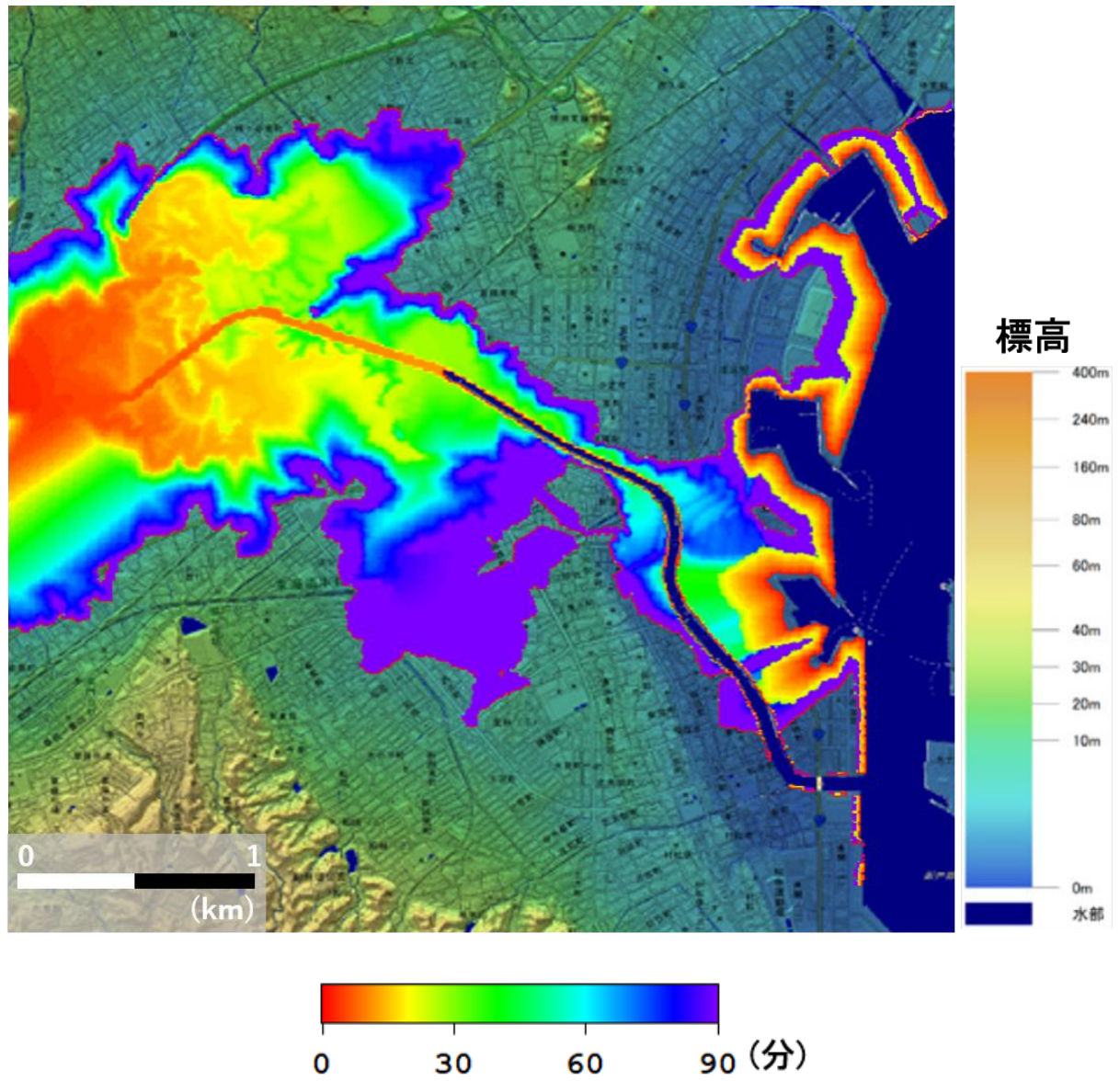
2.6 A

2.6 e

2 6 5

2019 4 5

2.8



3

3 1

2.7

e-Stat ¹⁹

GIS

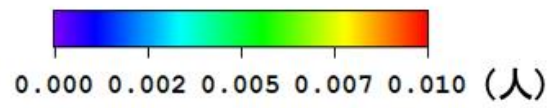
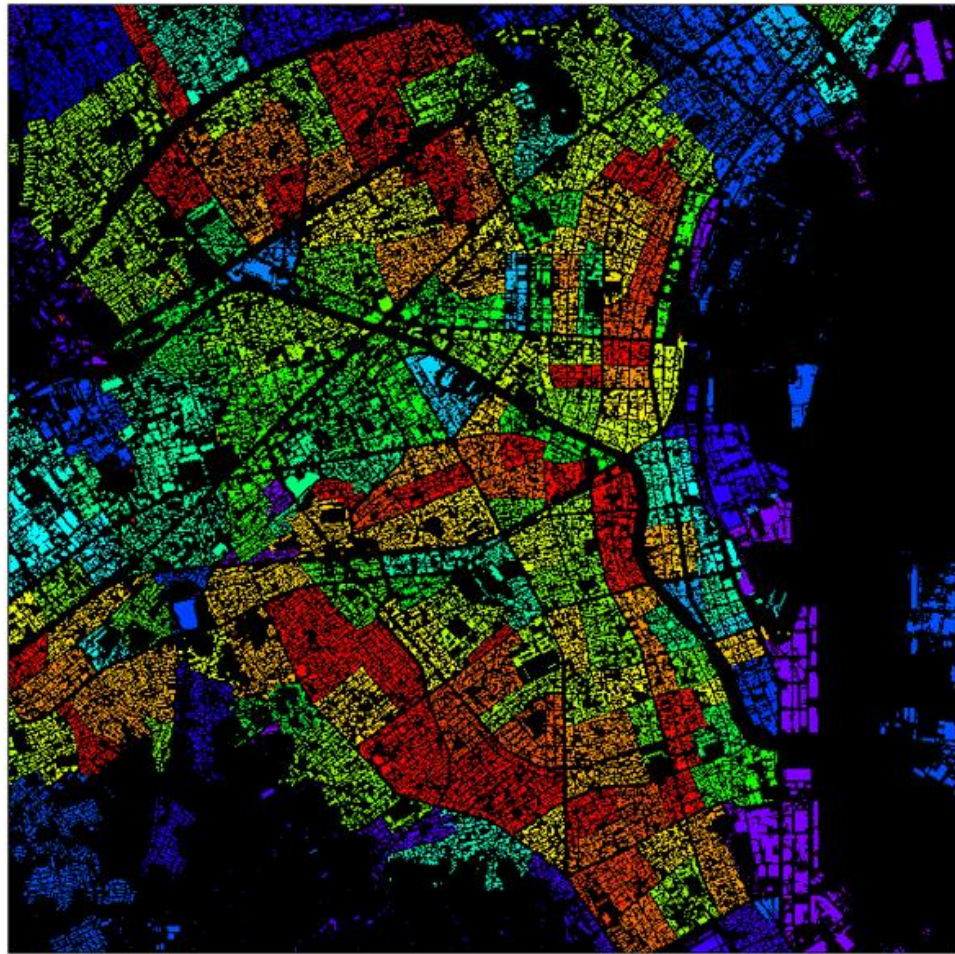
1m²

3.1

20

GIS

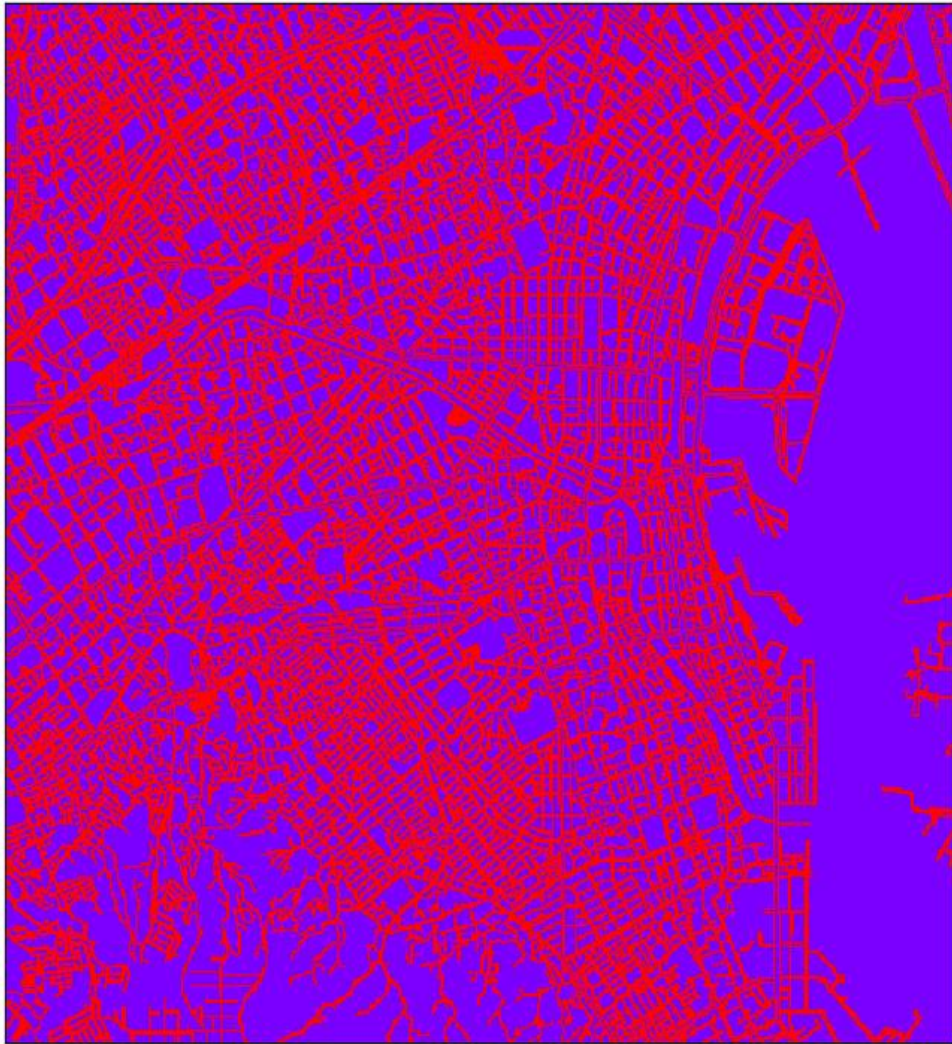
3.2



3.1

1m2

e-Stat



3.2

3 2

2.8 1m²

3.1

3.2

0 5 10 15 20 30

2.24 /h

23

21

11

45

45

3.3

45

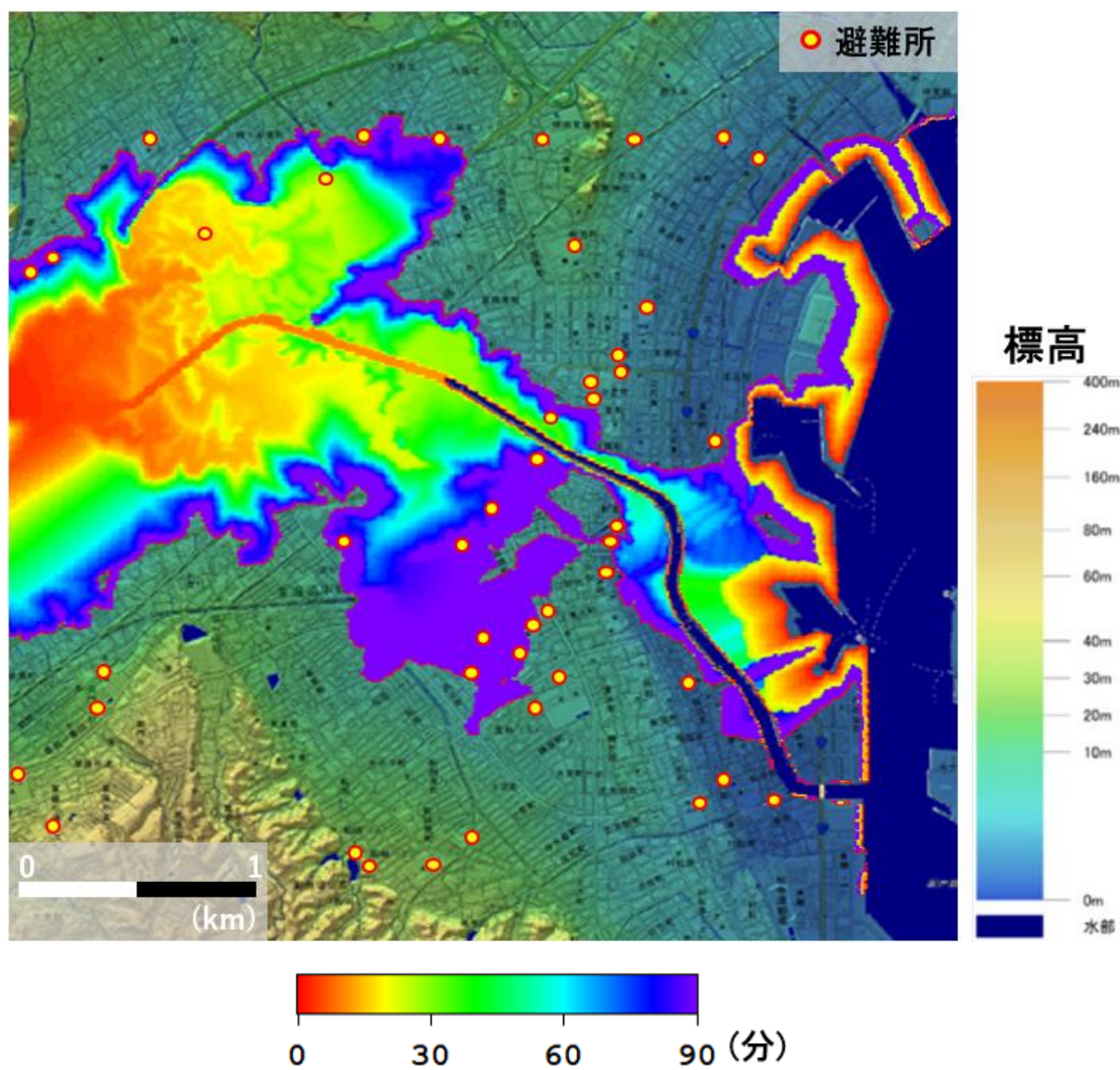
13

32

10

500

500



3.3

45

3 3

3.4

3.5

3.10

3.5

3.10

3.1

1m²

3.5

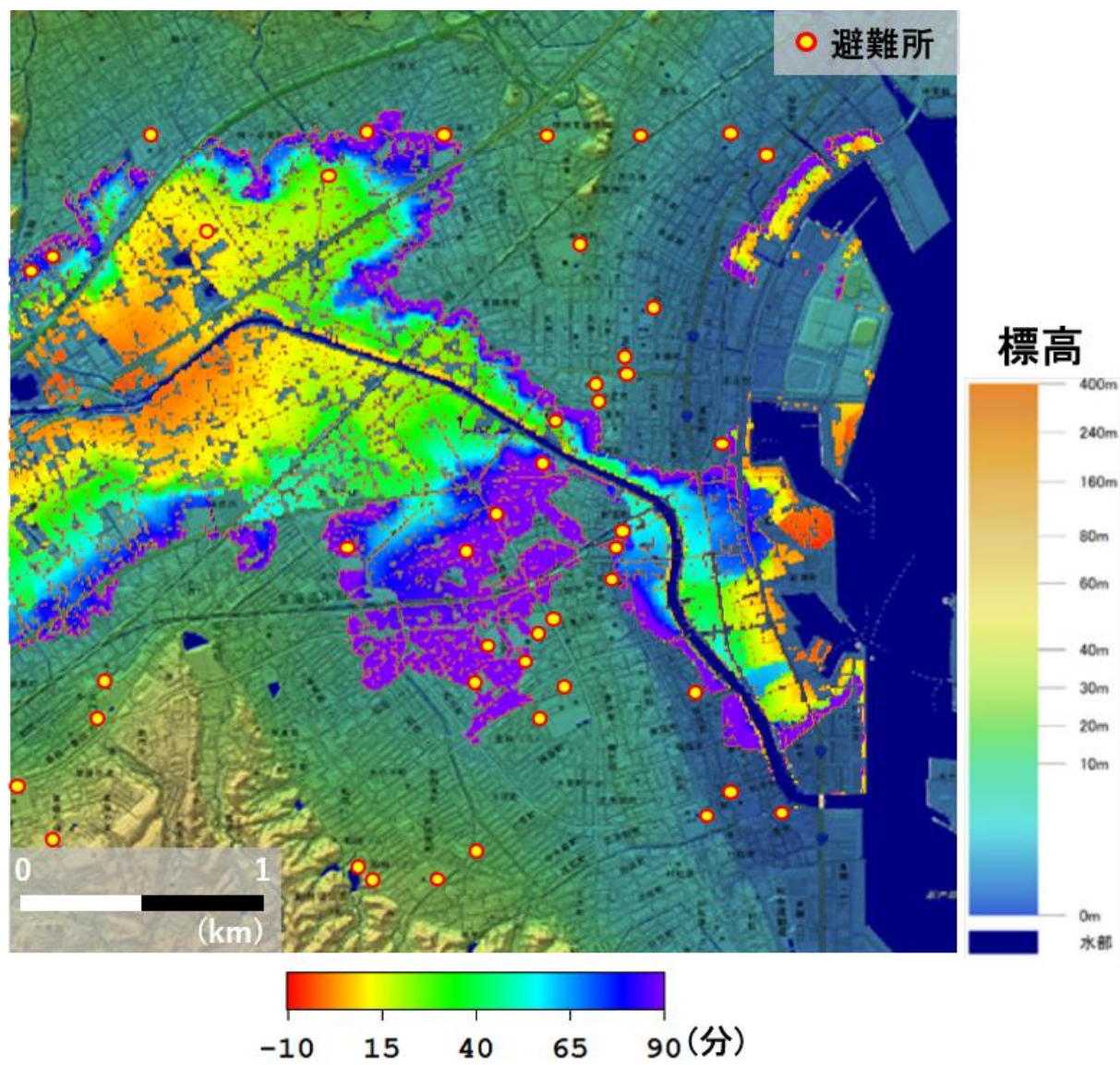
3.10

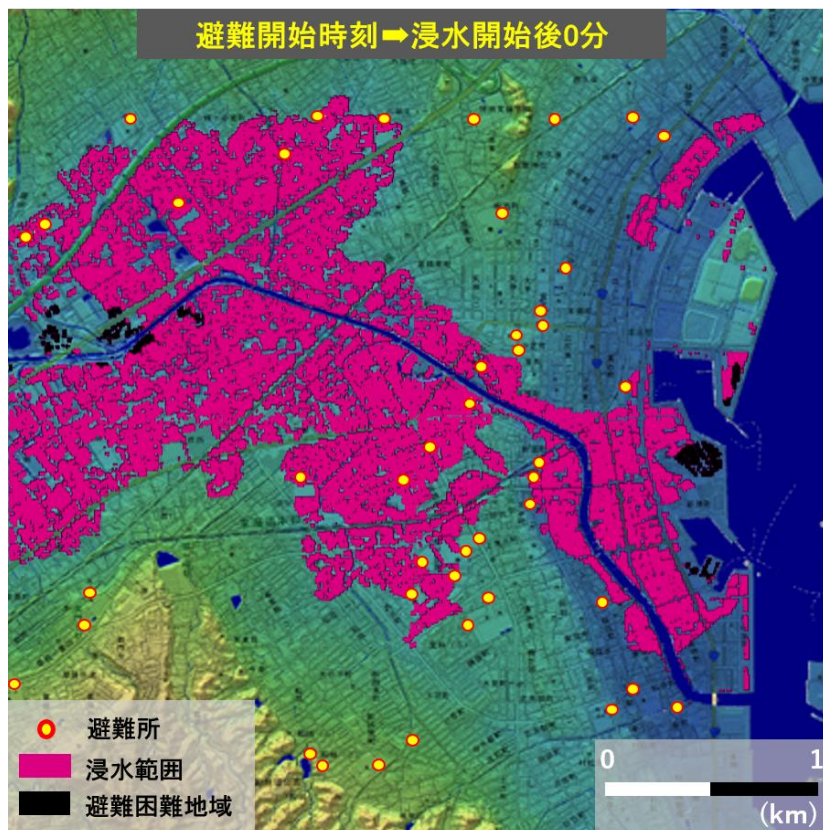
13,469

3.11

0

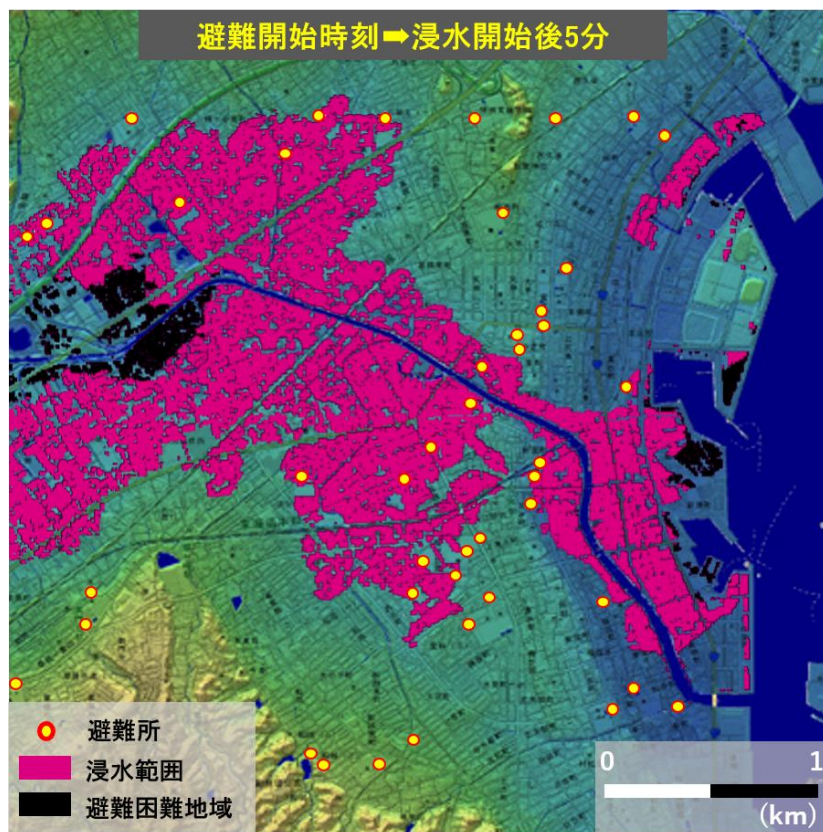
5 10 15 20 30 6





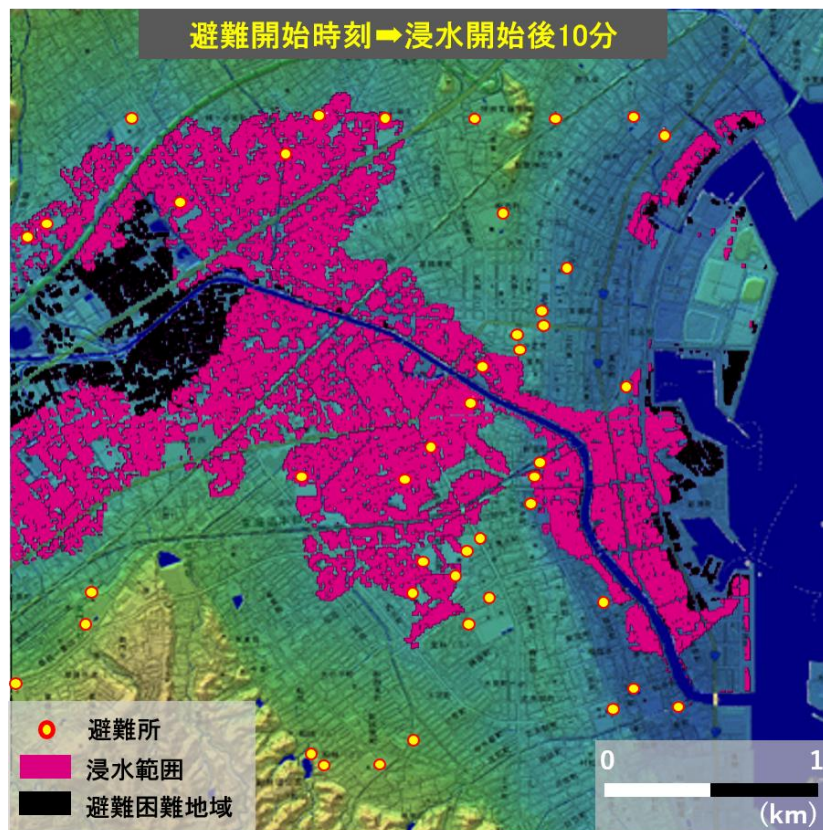
3.5

0



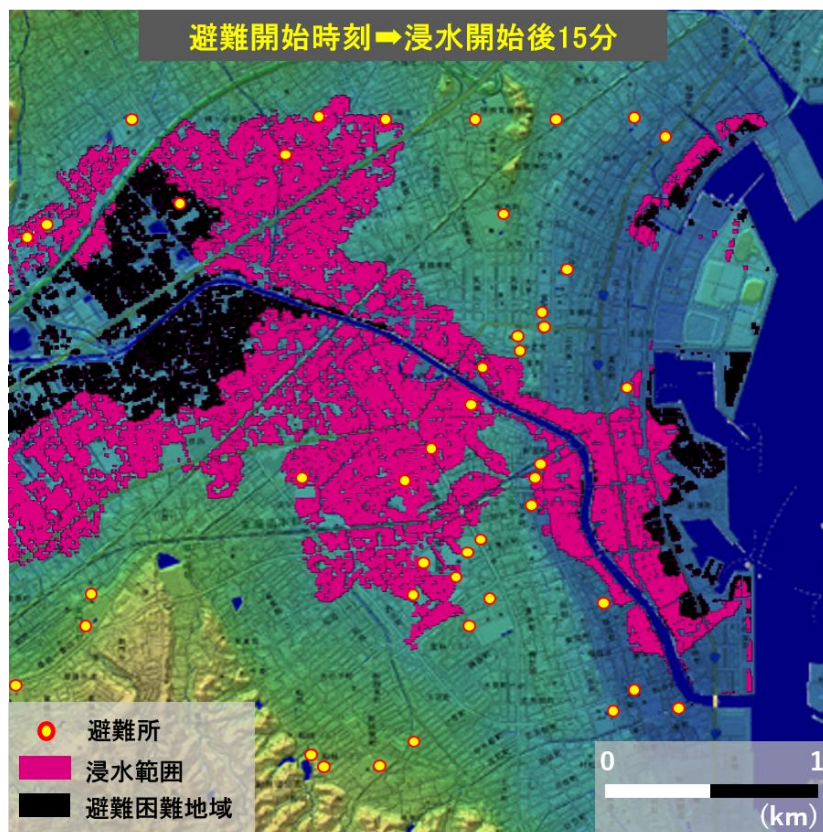
3.6

5



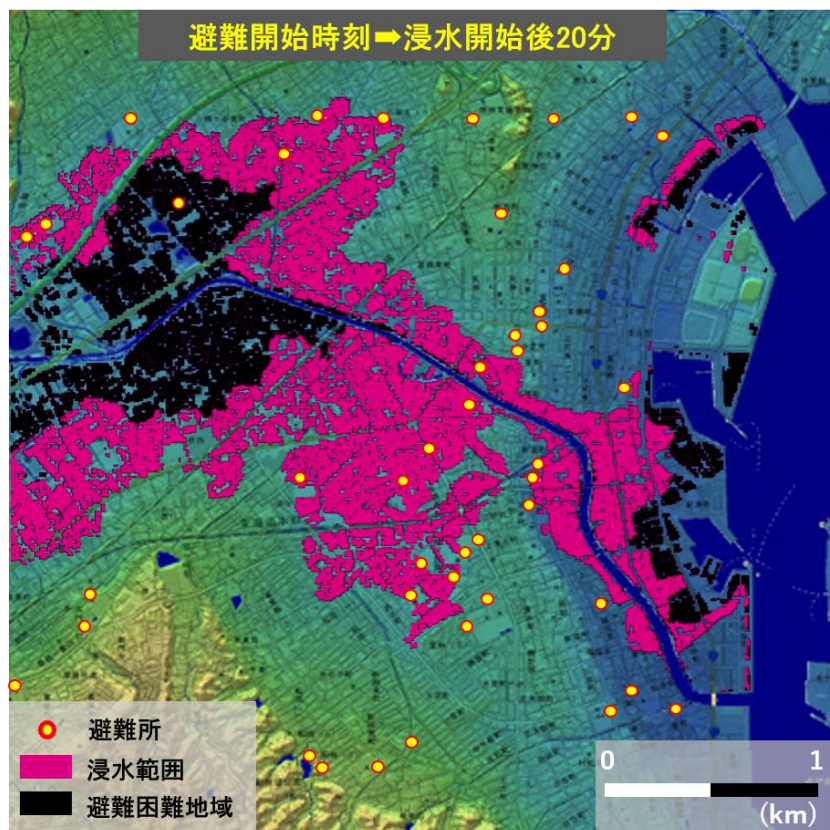
3.7

10



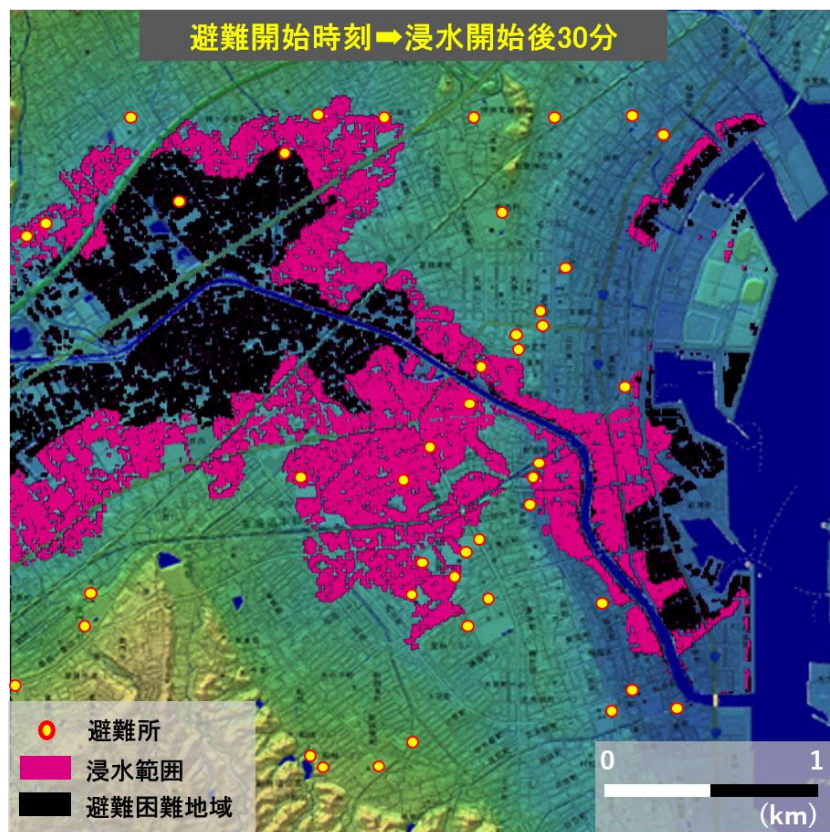
3.8

15



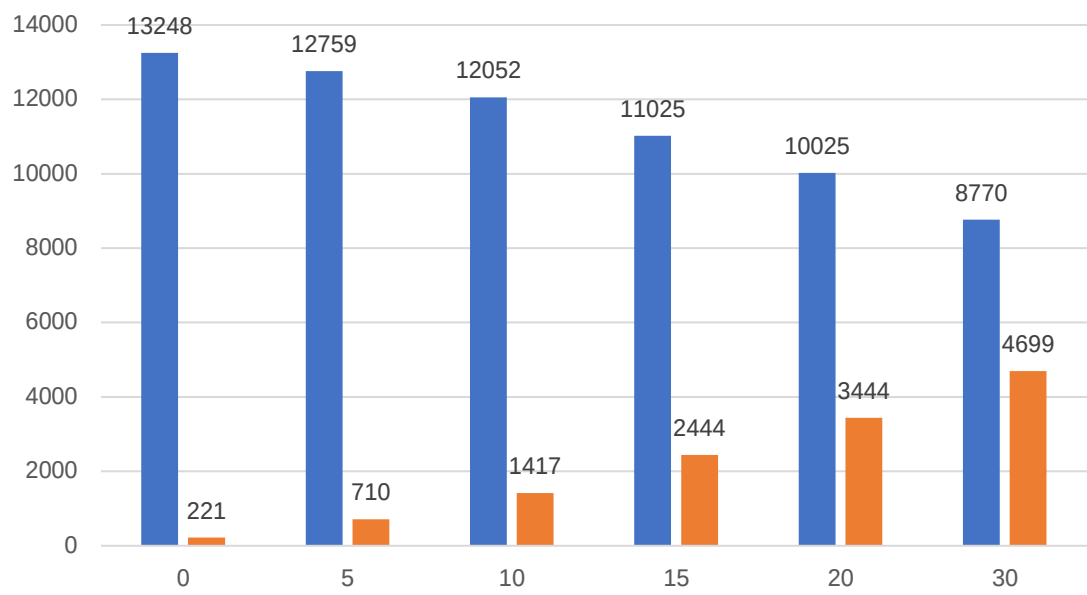
3.9

20



3.10

30



■ ■

3.11

45

3.5

3.10

3.11

3.11

5

15

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3

10

20

10

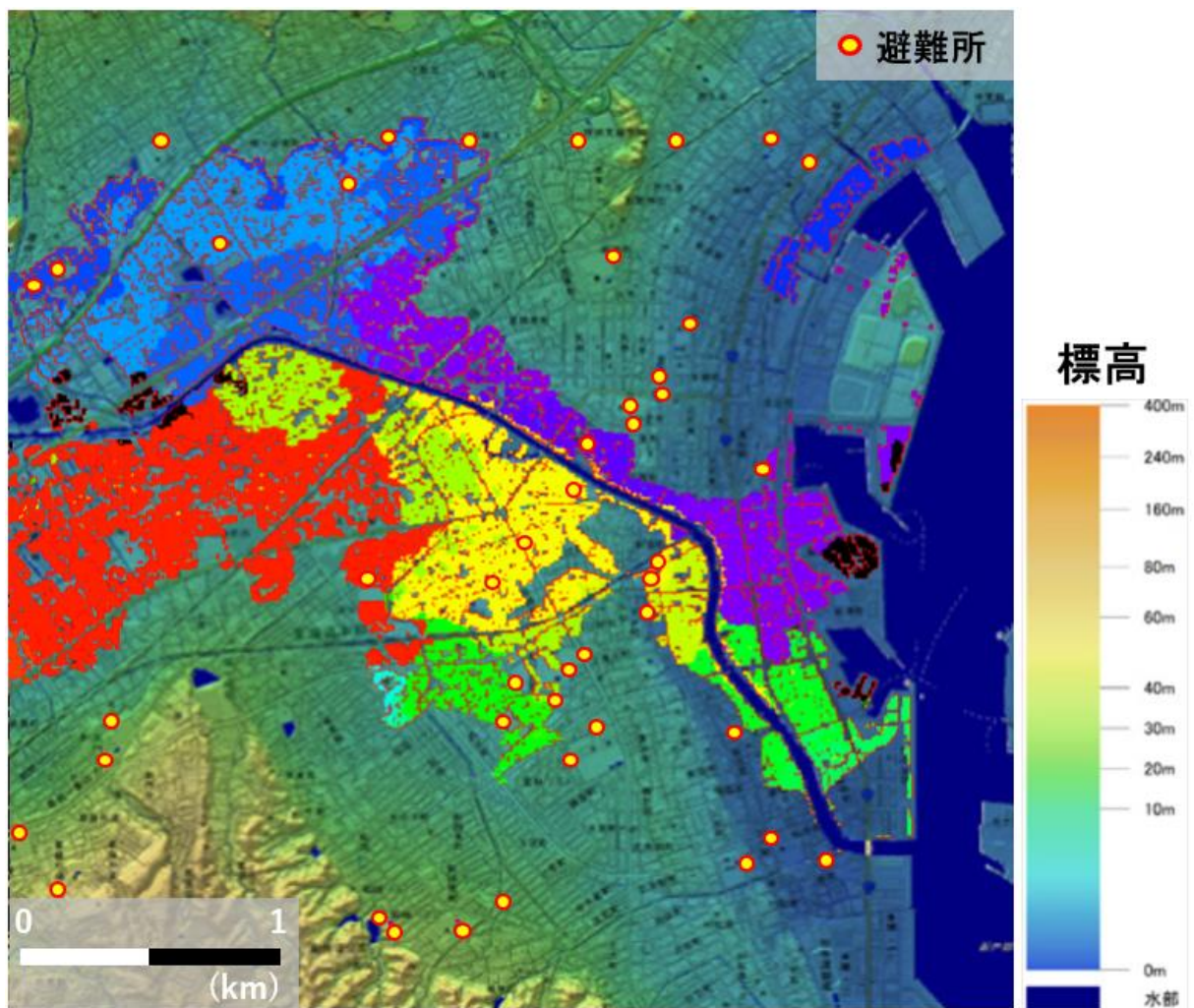
2

10

K19

3.12

K19



3.12

3 4

500

500

3.12

8

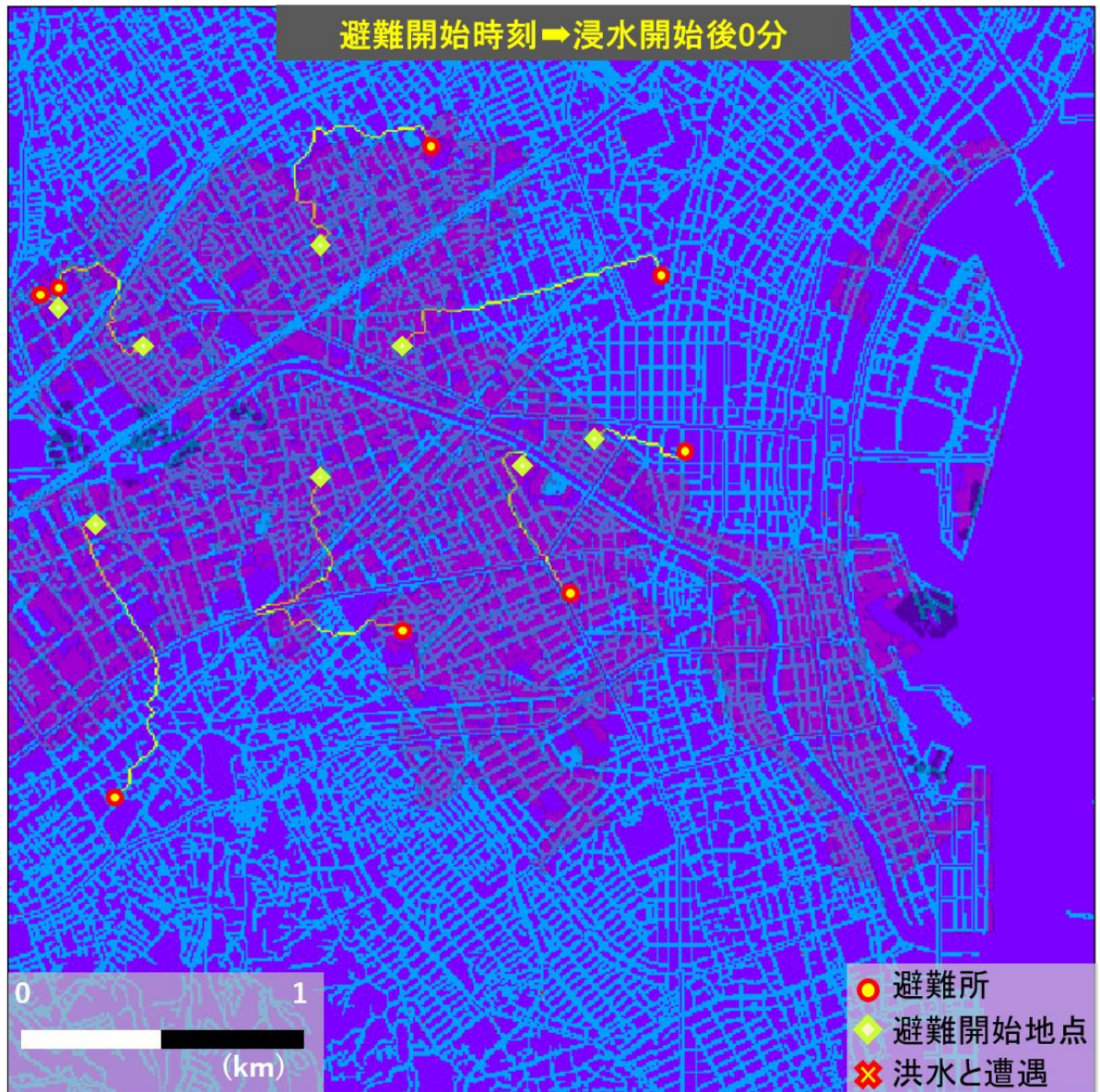
3.13

1

2

2

6.5



4

4 1

K19

3.13

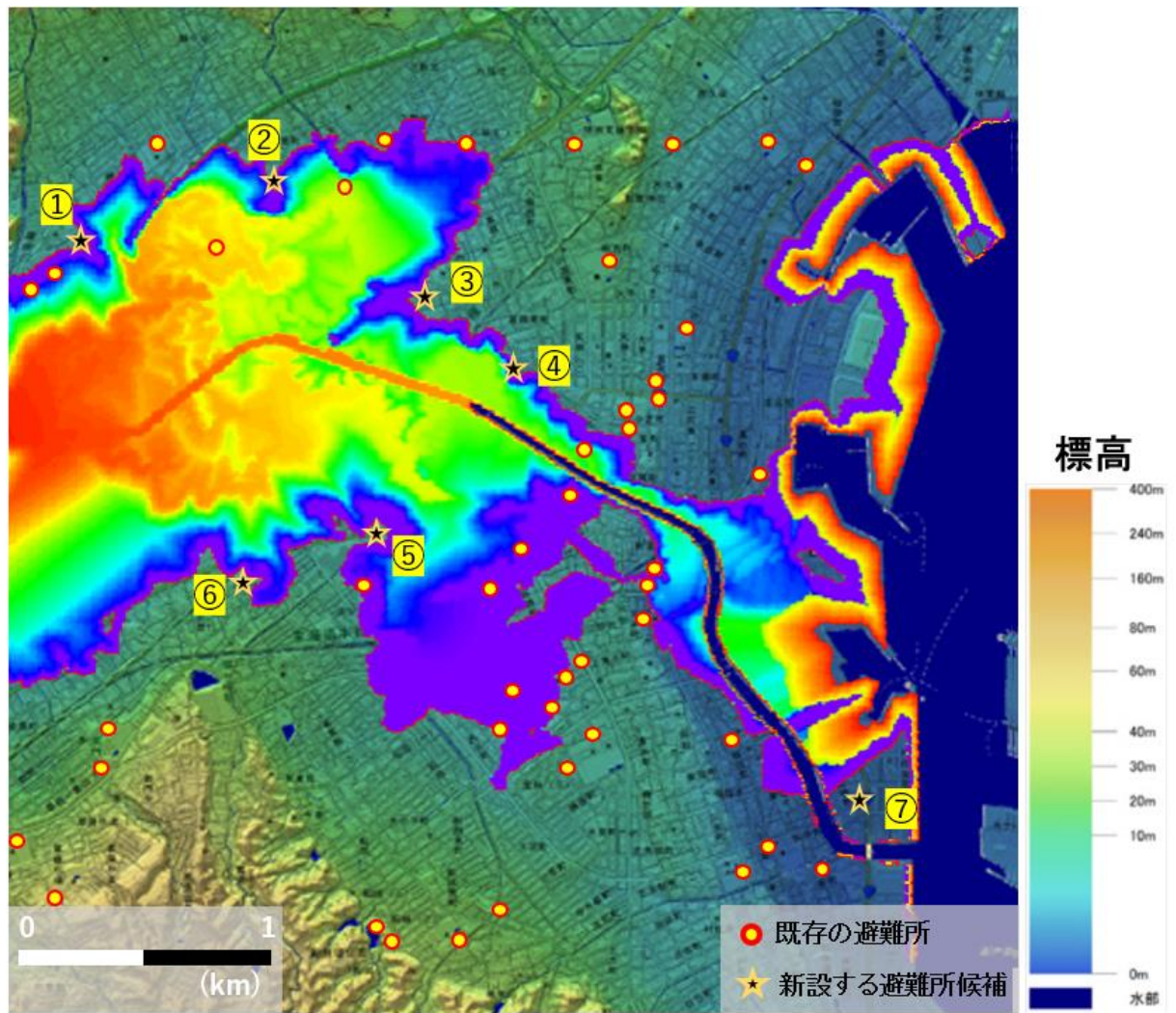
3.17

1

4.1

7

4.1



4.1

7

7

1

46

4.2 A

2

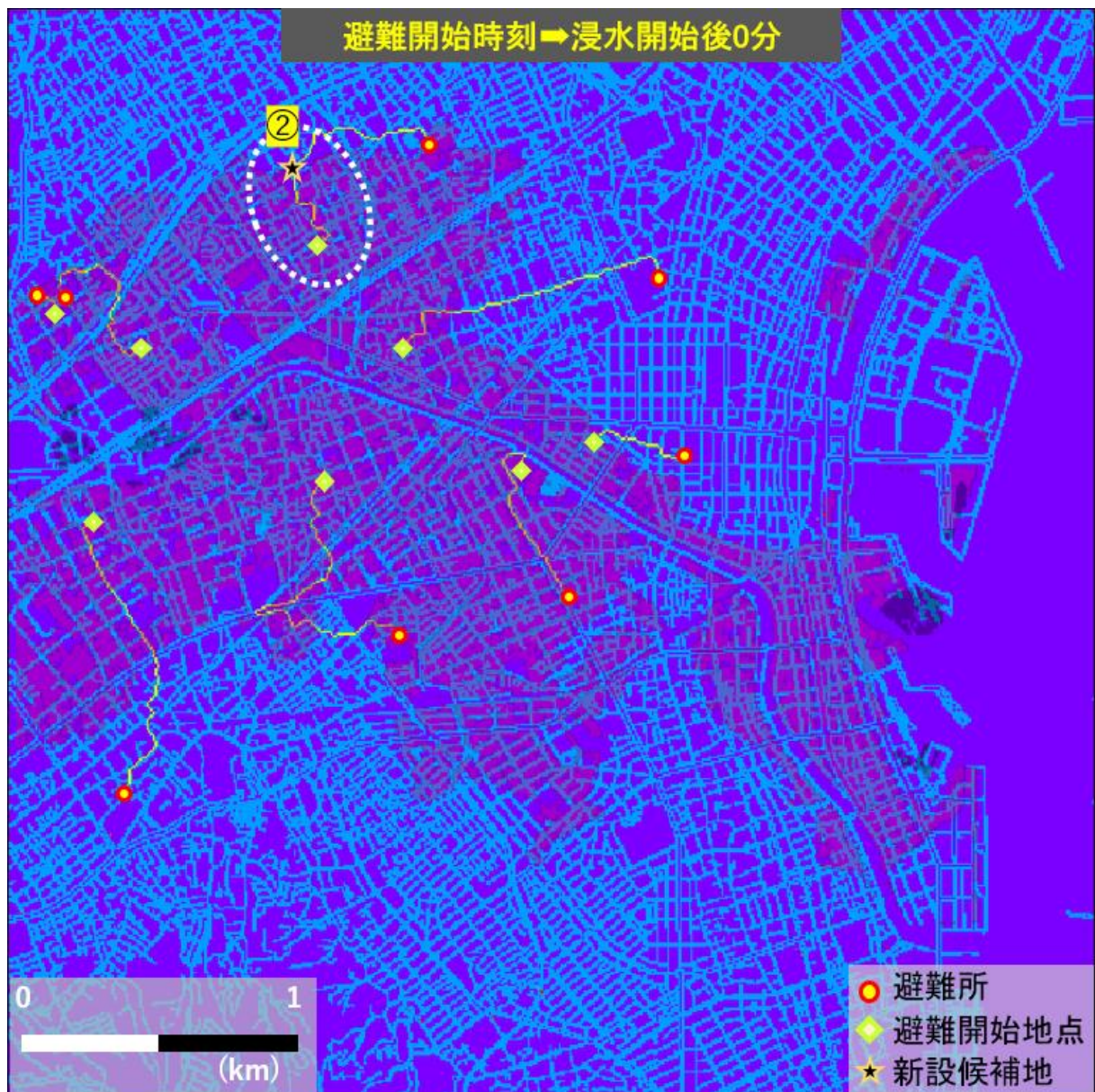
4.2 B

6

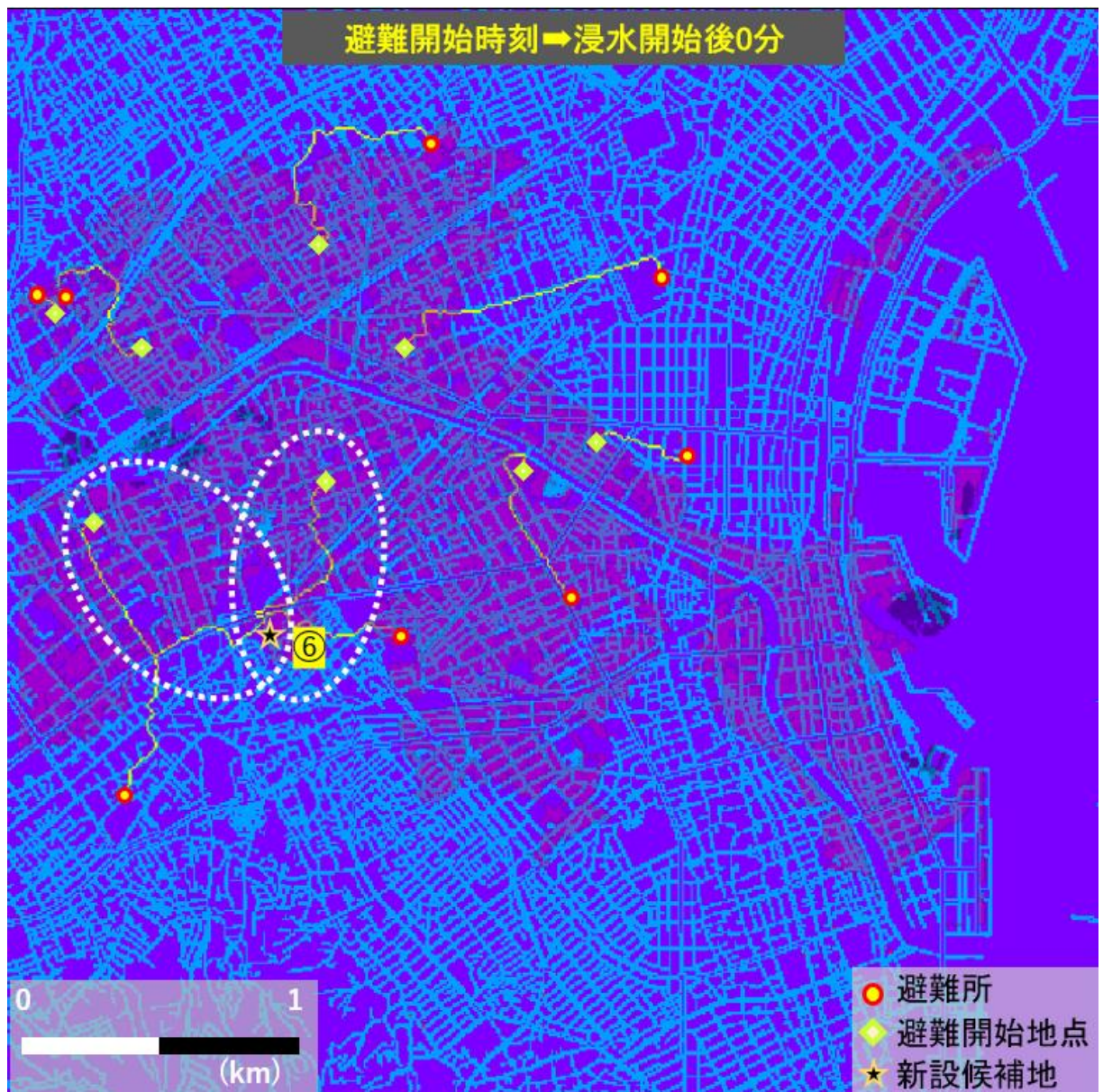
4.2 A

4.2 B

3.13



4.2 A



4.2 B

4.1

7

1

45

	0	5	10	15	20	25
45	221	710	1,417	2,444	3,444	4,699
45	221	710	1,417	2,444	3,444	4,699
45	221	710	1,417	2,444	3,444	4,699
45	221	710	1,417	2,444	3,444	4,699
45	221	710	1,417	2,444	3,444	4,699
45	221	710	1,417	2,444	3,444	4,699
45	221	710	1,417	2,444	3,444	4,699
45	221	710	1,417	2,444	3,444	4,699

4.1

45

45

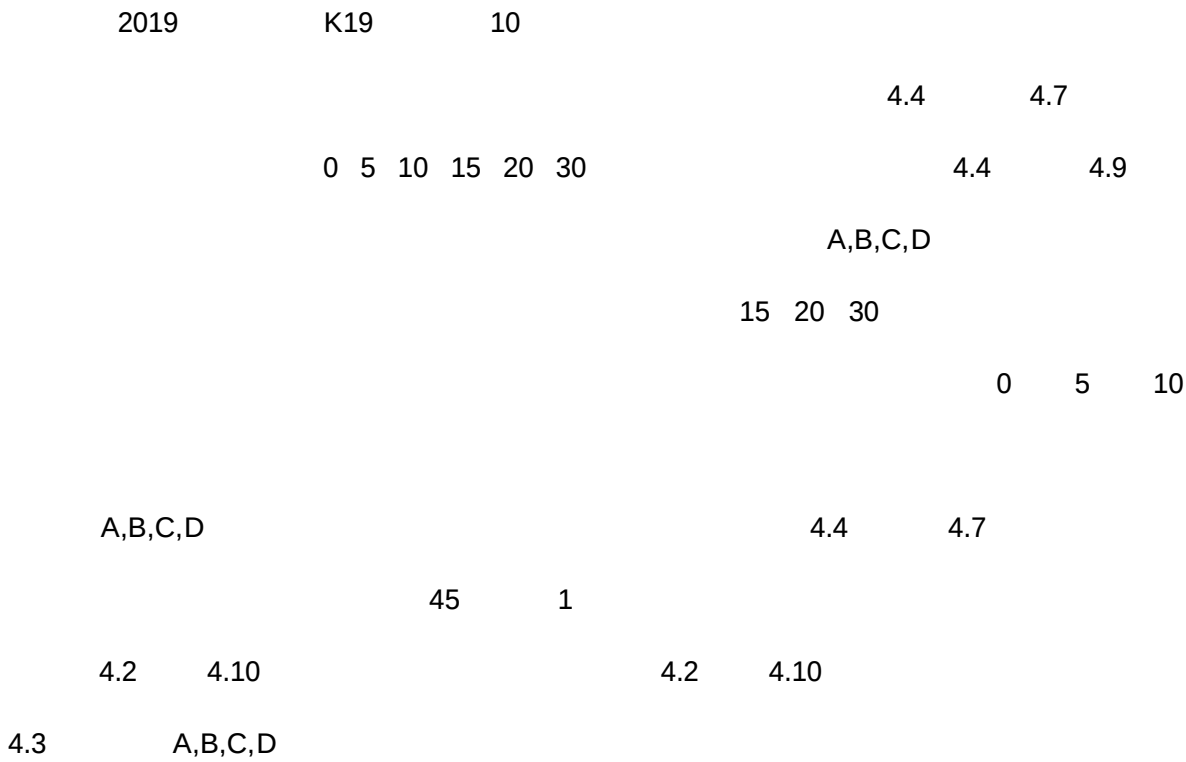
7

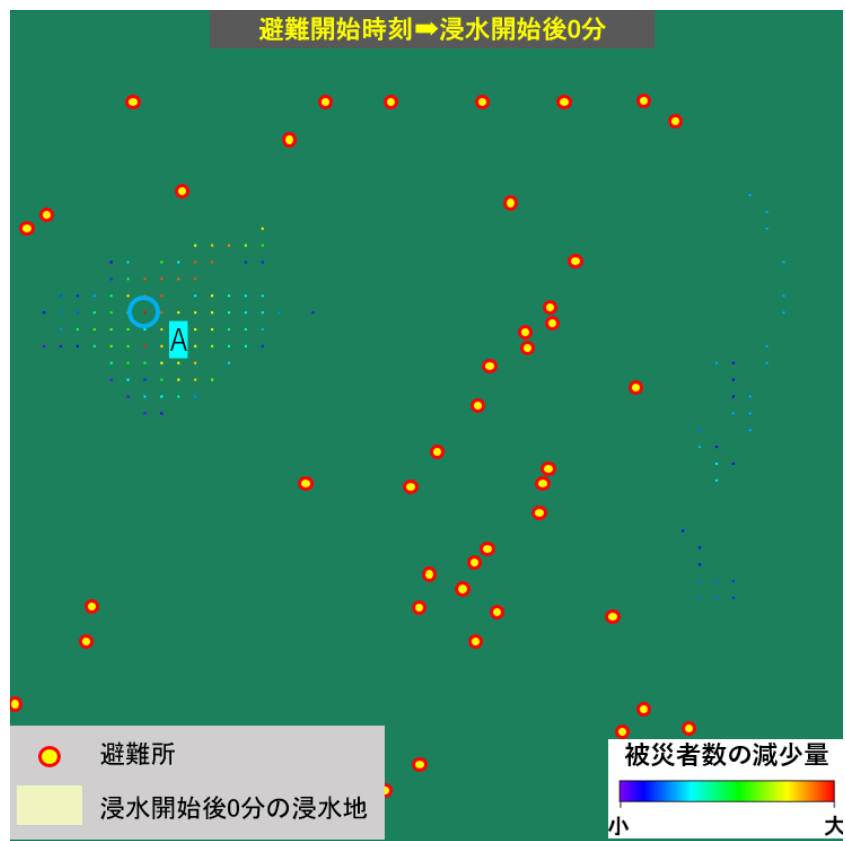
1

46

4.1

4 2

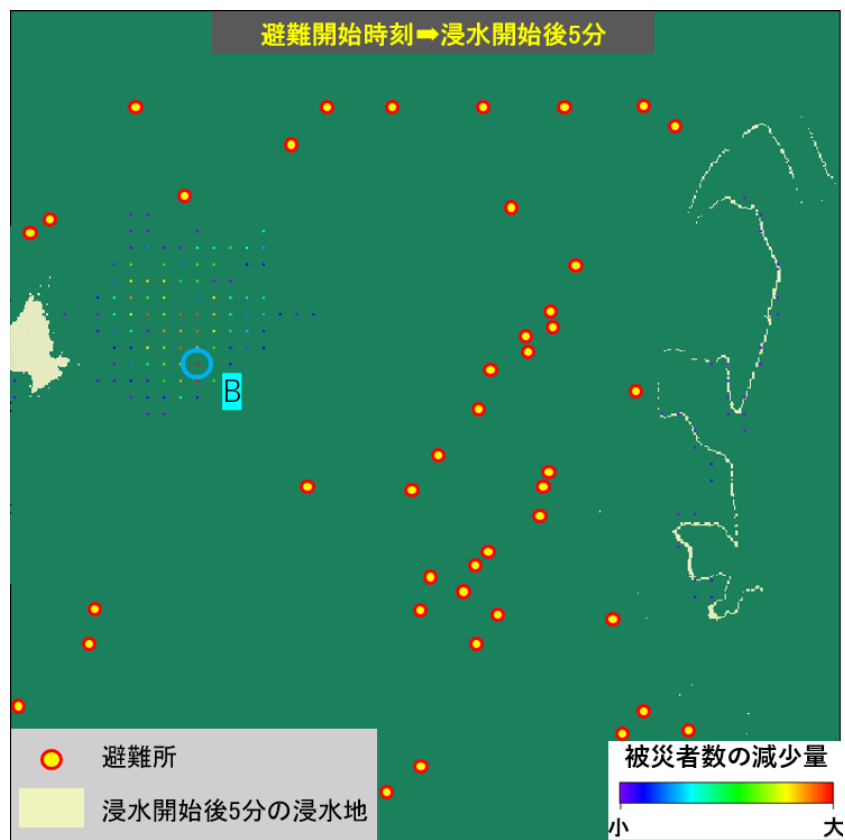




4.4

A

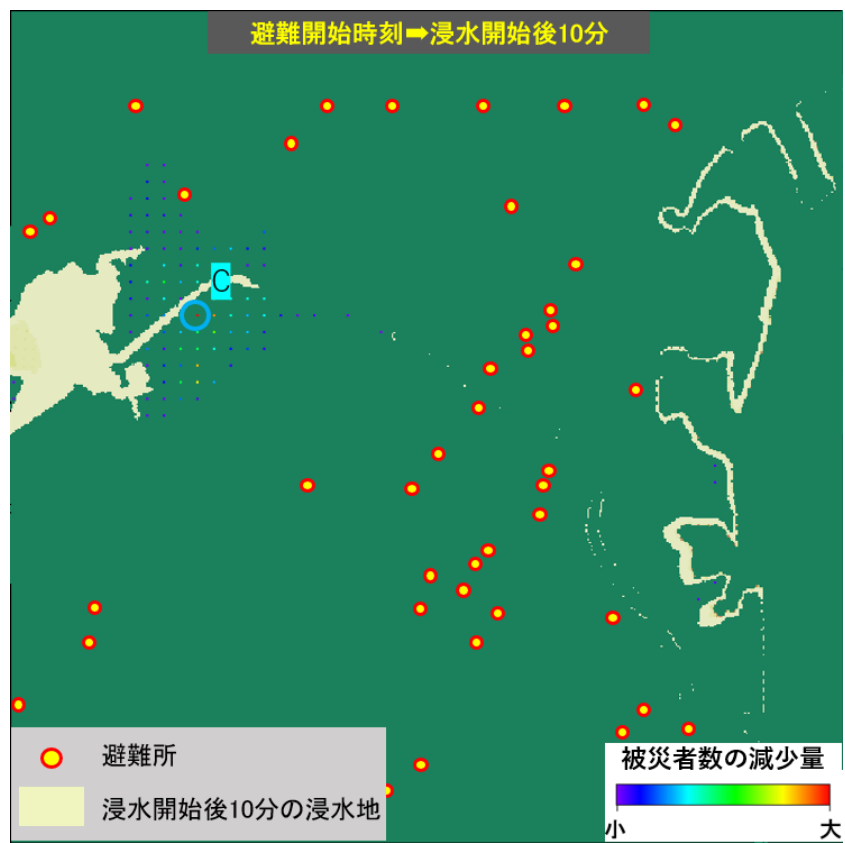
0



4.5

B

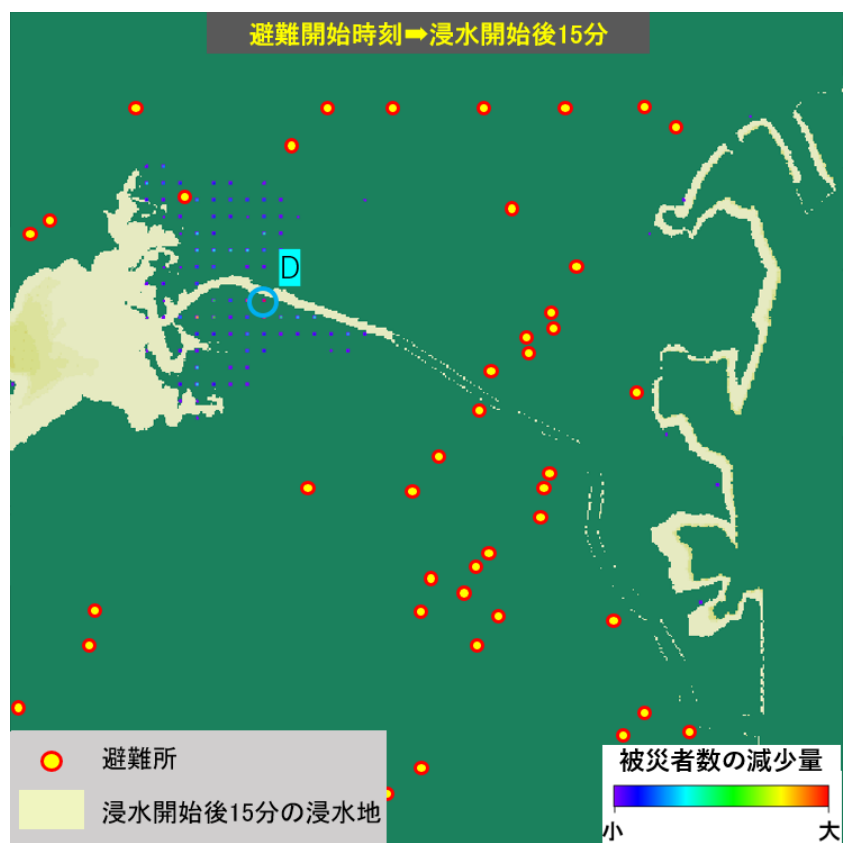
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4.6

C

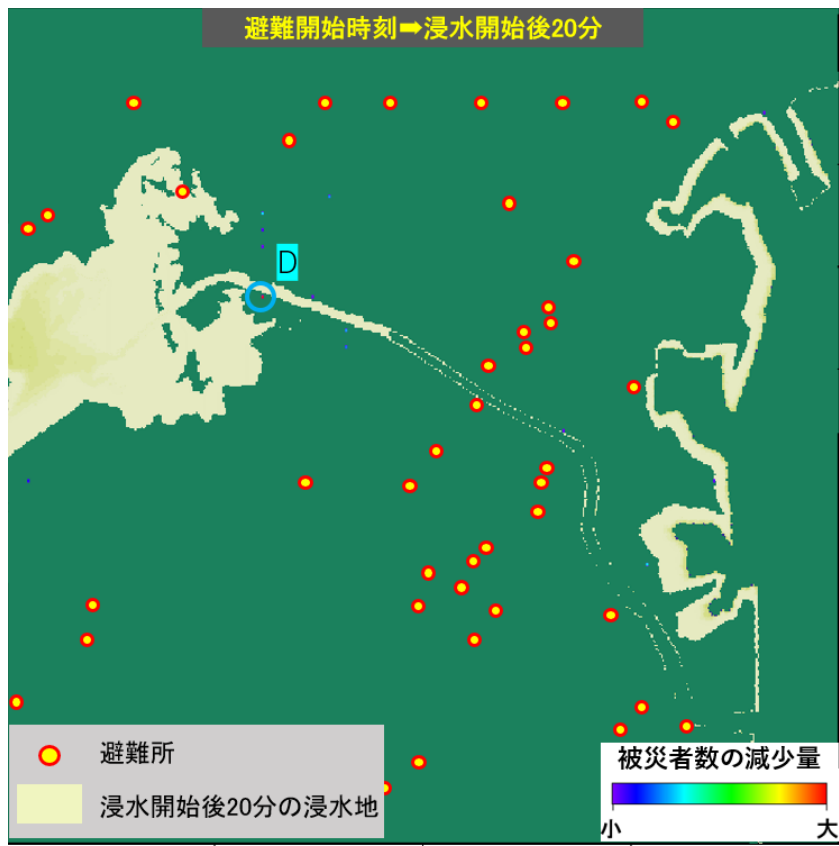
10



4.7

D

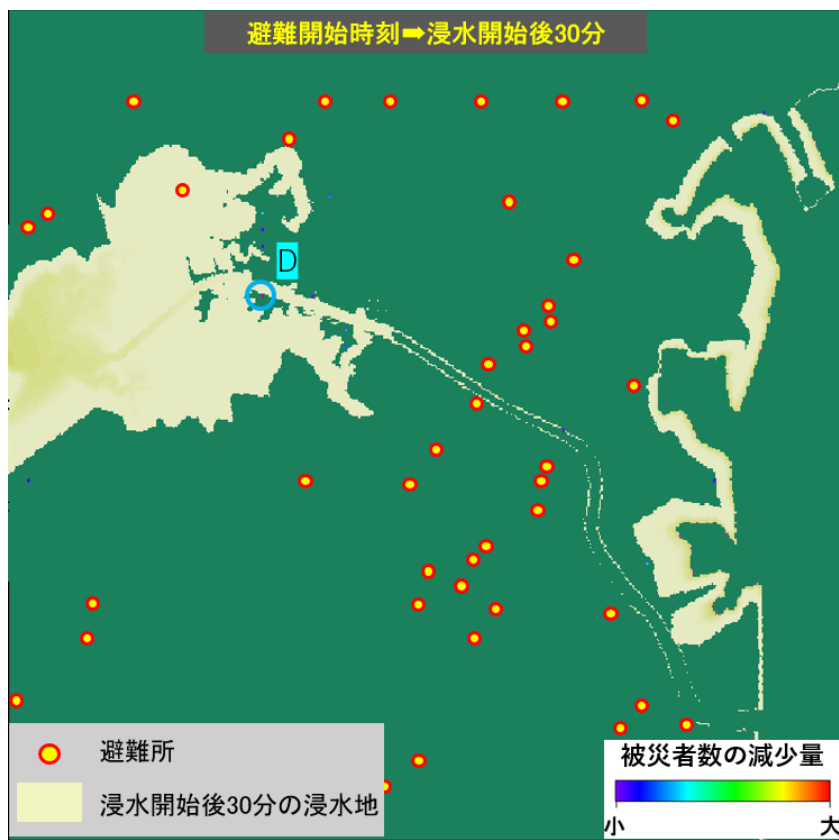
15



4.8

D

20

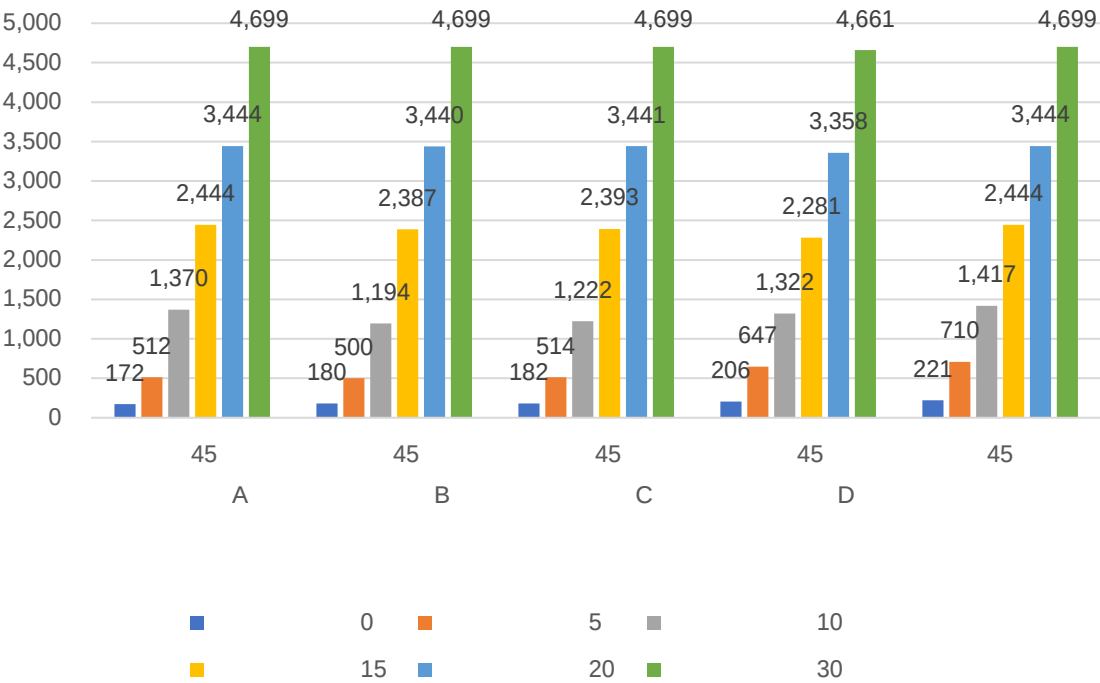


4.9

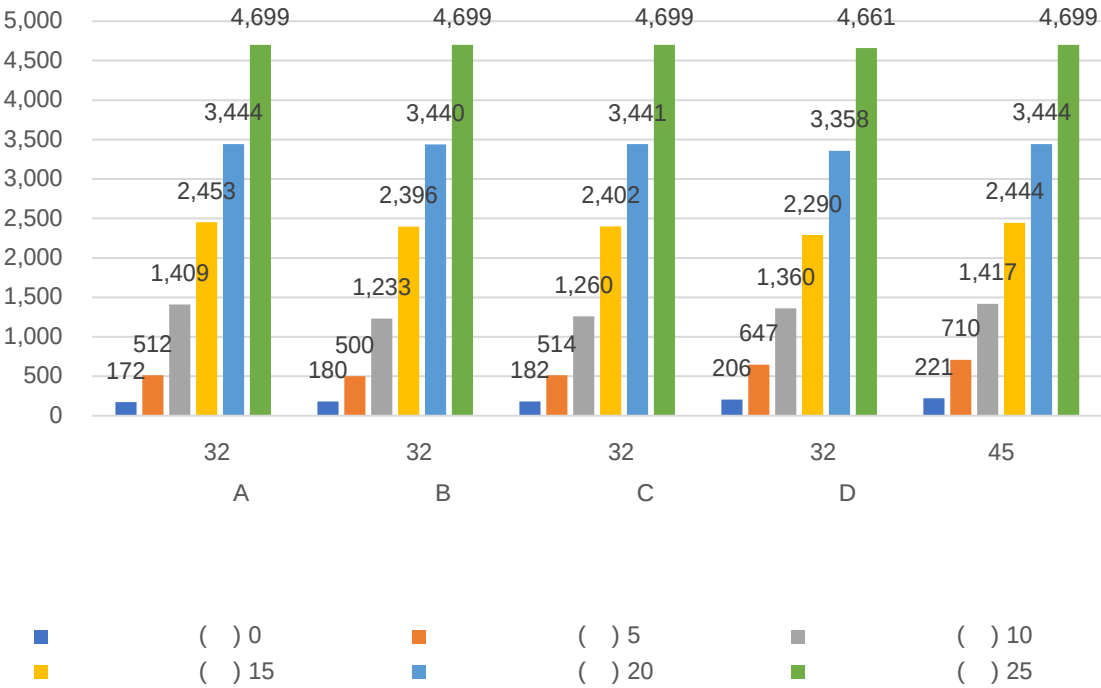
D

30

	0	5	10	15	20	30
45 A	172	512	1,370	2,444	3,444	4,699
45 B	180	500	1,194	2,387	3,440	4,699
45 C	182	514	1,222	2,393	3,441	4,699
45 D	206	647	1,322	2,281	3,358	4,661
45	221	710	1,417	2,444	3,444	4,699



	0	5	10	15	20	25
32 A	172	512	1,409	2,453	3,444	4,699
32 B	180	500	1,233	2,396	3,440	4,699
32 C	182	514	1,260	2,402	3,441	4,699
32 D	206	647	1,360	2,290	3,358	4,661
45	221	710	1,417	2,444	3,444	4,699



4.5

4

1

	0	5	10	15	20	25
A	22.17	27.89	0.56	-0.37	0.00	0.00
B	18.55	29.58	13.0	1.96	0.12	0.00
C	17.65	27.61	11.1	1.72	0.09	0.00
D	6.79	8.87	4.02	6.30	2.50	0.81

4.4

4.11

32

4

1

4.4

4.11

15

A

45

0.37

4.2

4.4

10

15

32

1

45

B C D

13

1

4.3

4.5

4

30

5

iRIC

6

2 ~6.5

0 5 10 15 20 30

2.24 /h

6

K19

GIS

1m²

GIS

K19

1

19

10

32

1

33

45

30

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