Supplementary Materials

This document includes:

- Table S1. ERS-1/2 images used for the Miami Beach study area. The perpendicular baseline is calculated in respect to the master image.
- Table S2. ERS-1/2 images used for the Norfolk (VA) study area. The perpendicular baseline is calculated in respect to the master image.
- Table S3. Critical baseline values (B_{crit}) between master and slave connections generated for the Miami Beach study area.
- Table S4. Critical baseline values (B_{crit}) between master and slave connections generated for the Norfolk (VA) study area.
- Table S5. Number of points affected by subsidence in Miami Beach detected with SBAS InSAR.
- Table S6. Number of points affected by subsidence in four selected locations of Norfolk (VA) detected with SBAS InSAR.
- Fig. S1. Example of groundwater level measured at one well in the region with long time series record.
- Fig. S2. Map showing the locations of the ground control points used for Miami Beach.
- Fig. S3. Map showing the locations of the ground control points used for Norfolk (VA).
- Fig. S4. Uncertainty map of the mean velocities obtained over Miami Beach.
- Fig. S5. Uncertainty map of the mean velocities obtained over Norfolk (VA).
- Fig. S6. Total vertical velocity map over Norfolk (VA) from 1992 to 1998.

Table S1. ERS-1/2 track 240 descending images used for the Miami Beach study area. The perpendicular baseline (B⊥) is calculated in respect to the master image acquired on 31/01/1996.

IMAGE NUMBER	ACQUISITION DATE	B⊥ (M)
1	03/05/1993	162.538
2	07/06/1993	-775.079
3	22/03/1995	-903.778
4	09/08/1995	-332.138
5	19/10/1995	922.668
6	22/11/1995	-1312.48
7	23/11/1995	-1037.36
8	27/12/1995	422.785
9	28/12/1995	103.292
10	31/01/1996	0
11	01/02/1996	112.751
12	10/04/1996	118.741
13	11/04/1996	215.746
14	15/05/1996	121.995
15	16/01/1997	-216.619
16	20/02/1997	-411.568
17	27/03/1997	-101.444
18	18/09/1997	-670.932
19	05/02/1998	-502.543
20	12/03/1998	-512.731
21	16/04/1998	-190.476
22	25/06/1998	-1242.08
23	30/07/1998	-116.168
24	06/05/1999	221.843

Table S2. ERS-1/2 track 192 descending images used for the Norfolk (VA) study area. The perpendicular baseline (B⊥) is calculated in respect to the master image acquired on 28/05/1995.

IMAGE NUMBER	ACQUISITION DATE	B⊥ (M)
1	19/06/1992	-290.815
2	28/08/1992	267.75
3	02/10/1992	646.029
4	30/04/1993	815.829
5	04/06/1993	-816.065
6	09/07/1993	-1007.91
7	17/09/1993	661.165
8	23/04/1995	-162.748
9	28/05/1995	0
10	15/10/1995	915.939
11	16/10/1995	1207.98
12	19/11/1995	-776.117
13	20/11/1995	-947.77
14	12/05/1996	544.316
15	13/05/1996	386.724
16	26/08/1996	-655.852
17	30/09/1996	-138.51
18	04/11/1996	1241.66
19	09/12/1996	-485.635
20	13/01/1997	150.511
21	17/02/1997	-198.51
22	24/03/1997	103.831
23	28/04/1997	-350.432
24	02/06/1997	-246.524
25	07/07/1997	-138.975
26	11/08/1997	162.68
27	24/11/1997	398.938
28	02/02/1998	30.612
29	09/03/1998	-421.642
30	13/04/1998	-38.7683
31	31/08/1998	299.654
32	09/11/1998	877.932

Table S3. Critical baseline values (B_{crit}) between master and slave connections generated for the Miami Beach study area.

MASTER DATE	SLAVE DATE	B_{crit} (M)
16/01/1997	09/08/1995	916.29
	28/12/1995	915.92
	31/01/1996	916.26
	01/02/1996	915.91
	10/04/1996	915.89
	11/04/1996	916.18
	15/05/1996	915.81
	20/02/1997	917.02
	27/03/1997	917.02
	18/09/1997	917.02
	05/02/1998	917.02
	12/03/1998	917.02
	16/04/1998	917.02
	30/07/1998	917.02
	06/05/1999	917.02
16/04/1998	09/08/1995	916.29
	28/12/1995	915.92
	31/01/1996	916.26
	01/02/1996	915.91
	10/04/1996	915.89
	11/04/1996	916.18
	15/05/1996	915.81
	20/02/1997	917.60
	27/03/1997	916.59
	18/09/1997	918.52
	05/02/1998	917.88
	12/03/1998	917.95
	30/07/1998	916.84
	06/05/1999	916.84
09/08/1995	03/05/1993	915.75
	27/12/1995	916.29
	28/12/1995	916.29
	31/01/1996	916.29
	01/02/1996	916.29
	10/04/1996	916.29
	11/04/1996	916.29
	15/05/1996	916.29

	20/02/1997	916.29
	27/03/1997	916.29
	05/02/1998	916.29
	12/03/1998	916.29
27/03/1997	28/12/1995	915.92
	31/01/1996	916.26
	01/02/1996	915.91
	10/04/1996	915.89
	11/04/1996	916.18
	15/05/1996	915.81
	20/02/1997	917.60
	05/02/1998	916.59
	12/03/1998	916.59
	30/07/1998	916.59
	06/05/1999	916.59
30/07/1998	28/12/1995	915.92
	31/01/1996	916.26
	01/02/1996	915.91
	10/04/1996	915.89
	11/04/1996	916.18
	15/05/1996	915.81
	20/02/1997	917.60
	05/02/1998	917.88
	12/03/1998	917.95
	06/05/1999	916.67
27/12/1995	03/05/1993	915.75
	19/10/1995	913.21
	10/04/1996	914.89
	11/04/1996	914.89
	15/05/1996	914.89
31/01/1996	28/12/1995	915.92
	01/02/1996	916.26
	10/04/1996	916.26
	11/04/1996	916.26
	20/02/1997	916.26
22/03/1995	23/11/1995	919.40
28/12/1995	03/05/1993	915.75
	01/02/1996	915.92
	10/04/1996	915.92
	11/04/1996	915.92
	15/05/1996	915.92

23/11/1995	07/06/1993	918.82
	22/11/1995	920.68
	18/09/1997	919.73
	25/06/1998	919.73
11/04/1996	01/02/1996	915.91
	10/04/1996	915.89
	15/05/1996	916.18
	20/02/1997	916.18
20/02/1997	18/09/1997	917.60
	05/02/1998	917.60
	12/03/1998	917.60
01/02/1996	10/04/1996	915.91
18/09/1997	05/02/1998	918.52
	12/03/1998	918.52
22/11/1995	25/06/1998	920.68
10/04/1996	15/05/1996	915.89
05/02/1998	12/03/1998	917.88

Table S4. Critical baseline values (B_{crit}) between master and slave connections generated for the Norfolk (VA) study area.

MASTER DATE	SLAVE DATE	B_{crit} (M)
28/05/1995	19/06/1992	1002.49
	28/08/1992	1000.62
	23/04/1995	1002.06
	12/05/1996	1001.52
	13/05/1996	1001.52
	30/09/1996	1001.52
	09/12/1996	1001.52
	13/01/1997	1001.52
	17/02/1997	1001.52
	24/03/1997	1001.52
	28/04/1997	1001.52
	02/06/1997	1001.52
	07/07/1997	1001.52
	11/08/1997	1001.52
	24/11/1997	1001.52

	02/02/1998	1001.52
	09/03/1998	1001.52
	13/04/1998	1001.52
	31/08/1998	1001.52
23/04/1995	19/06/1992	1002.49
	28/08/1992	1000.62
	13/05/1996	1002.06
	26/08/1996	1002.06
	30/09/1996	1002.06
	09/12/1996	1002.06
	13/01/1997	1002.06
	17/02/1997	1002.06
	24/03/1997	1002.06
	28/04/1997	1002.06
	02/06/1997	1002.06
	07/07/1997	1002.06
	11/08/1997	1002.06
	24/11/1997	1002.06
	02/02/1998	1002.06
	09/03/1998	1002.06
	13/04/1998	1002.06
17/02/1997	19/11/1995	1004.24
	13/05/1996	1000.20
	26/08/1996	1003.81
	30/09/1996	1002.03
	09/12/1996	1003.31
	13/01/1997	1001.06
	24/03/1997	1002.23
	28/04/1997	1002.23
	02/06/1997	1002.23
	07/07/1997	1002.23
	11/08/1997	1002.23
	24/11/1997	1002.23
	02/02/1998	1002.23
	09/03/1998	1002.23
	13/04/1998	1002.23
	31/08/1998	1002.23
13/05/1996	30/04/1993	998.70
	17/09/1993	999.31
	15/10/1995	998.46
	12/05/1996	999.64
	30/09/1996	1000.20
	13/01/1997	1000.20

	24/03/1997	1000.20
	07/07/1997	1000.20
	11/08/1997	1000.20
	24/11/1997	1000.20
	02/02/1998	1000.20
	13/04/1998	1000.20
	31/08/1998	1000.20
	09/11/1998	1000.20
30/09/1996	26/08/1996	1003.81
	09/12/1996	1002.03
	13/01/1997	1002.03
	24/03/1997	1002.03
	28/04/1997	1002.03
	02/06/1997	1002.03
	07/07/1997	1002.03
	11/08/1997	1002.03
	24/11/1997	1002.03
	02/02/1998	1002.03
	09/03/1998	1002.03
	13/04/1998	1002.03
	31/08/1998	1002.03
24/03/1997	12/05/1996	999.64
	09/12/1996	1003.31
	13/01/1997	1001.06
	28/04/1997	1001.25
	02/06/1997	1001.25
	07/07/1997	1001.25
	11/08/1997	1001.25
	24/11/1997	1001.25
	02/02/1998	1001.25
	09/03/1998	1001.25
	13/04/1998	1001.25
	31/08/1998	1001.25
28/04/1997	19/11/1995	1004.24
	20/11/1995	1004.85
	26/08/1996	1003.81
	09/12/1996	1003.31
	13/01/1997	1001.06
	02/06/1997	1002.72
	07/07/1997	1002.72
	11/08/1997	1002.72
	02/02/1998	1002.72
	09/03/1998	1002.72
	13/04/1998	1002.72

12/05/1996	30/04/1993	998.70
	17/09/1993	999.31
	15/10/1995	998.46
	13/01/1997	999.64
	11/08/1997	999.64
	24/11/1997	999.64
	02/02/1998	999.64
	13/04/1998	999.64
	31/08/1998	999.64
	09/11/1998	999.64
02/06/1997	19/11/1995	1004.24
	26/08/1996	1003.81
	09/12/1996	1003.31
	13/01/1997	1001.06
	07/07/1997	1002.41
	11/08/1997	1002.41
	02/02/1998	1002.41
	09/03/1998	1002.41
	13/04/1998	1002.41
	31/08/1998	1002.41
07/07/1997	26/08/1996	1003.81
	09/12/1996	1003.31
	13/01/1997	1001.06
	11/08/1997	1002.01
	24/11/1997	1002.01
	02/02/1998	1002.01
	09/03/1998	1002.01
	13/04/1998	1002.01
	31/08/1998	1002.01
09/03/1998	19/11/1995	1004.24
	20/11/1995	1004.85
	26/08/1996	1003.81
	09/12/1996	1003.31
	13/01/1997	1001.06
	11/08/1997	1001.01
	02/02/1998	1001.55
	13/04/1998	1003.02
15/10/1995	02/10/1992	999.38
	30/04/1993	998.70
	17/09/1993	999.31
	16/10/1995	998.46
	04/11/1996	998.46
	24/11/1997	998.46
	09/11/1998	998.46

24/11/1997	13/01/1997	1001.06
	11/08/1997	1001.01
	02/02/1998	1000.25
	13/04/1998	1000.25
	31/08/1998	1000.25
	09/11/1998	1000.25
04/06/1993	19/06/1992	1002.49
	09/07/1993	1004.35
	19/11/1995	1004.35
	20/11/1995	1004.35
	26/08/1996	1004.35
17/09/1993	28/08/1992	1000.62
	02/10/1992	999.38
	30/04/1993	998.70
	16/10/1995	999.31
	04/11/1996	999.31
09/12/1996	19/11/1995	1004.24
	20/11/1995	1004.85
	26/08/1996	1003.81
	02/02/1998	1003.31
	13/04/1998	1003.31
31/08/1998	13/01/1997	1001.06
	11/08/1997	1001.01
	02/02/1998	1001.55
	13/04/1998	1001.54
	09/11/1998	1000.56
16/10/1995	02/10/1992	999.38
	30/04/1993	998.70
	04/11/1996	997.44
	09/11/1998	997.44
28/08/1992	19/06/1992	1002.49
	02/10/1992	1000.62
	30/04/1993	1000.62
09/07/1993	19/11/1995	1004.98
	20/11/1995	1004.98
	26/08/1996	1004.98
13/01/1997	11/08/1997	1001.06
	02/02/1998	1001.06
	13/04/1998	1001.06

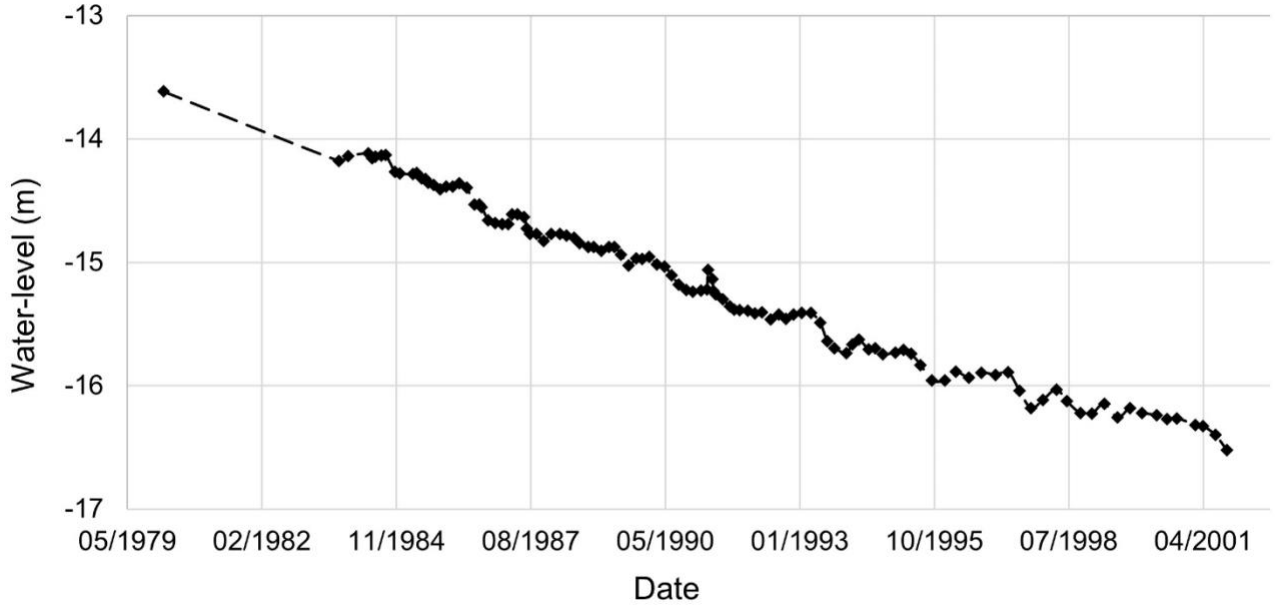
19/11/1995	20/11/1995	1004.24
	26/08/1996	1004.24
11/08/1997	02/02/1998	1001.01
	13/04/1998	1001.01
02/10/1992	30/04/1993	999.38
20/11/1995	26/08/1996	1004.85
04/11/1996	09/11/1998	997.32
02/02/1998	13/04/1998	1001.55

Table S5. Number of points affected by subsidence in Miami Beach detected with SBAS InSAR.

AREA NAME	Total points	Points with Minor subsidence (-1 / -3 mm/yr)	Points with Major subsidence (-3 / -6 mm/yr)	Total subsiding points (above σ)
Miami Beach	18,949	1,555	11	1,566 (1,538)

Table S6. Number of points affected by subsidence in four selected locations of Norfolk (VA) detected with SBAS InSAR.

AREA NAME	Total points	Points with Minor subsidence (-1 / -3 mm/yr)	Points with Major subsidence (-3 / -6 mm/yr)	Total subsiding points (above σ)
Willoughby Spit - Tunnel island (A)	2,659	274	52	326 (307)
Lamberts Point terminal - Craney Island (B)	5,595	2,070	366	2,436 (2,242)
East Beach (C)	18,768	1,605	10	1,615 (1,560)
Hampton Road Beltway (D)	21,899	17,612	414	18,026 (17,769)



46

47 **Figure S1.** Example of groundwater level time series (in respect to land surface) measured at
48 the "57C 21" well from 02/1980 to 10/2001 (data from https://waterdata.usgs.gov/nwis). The
49 "57C 21" well is located around 30 km west of the study area.

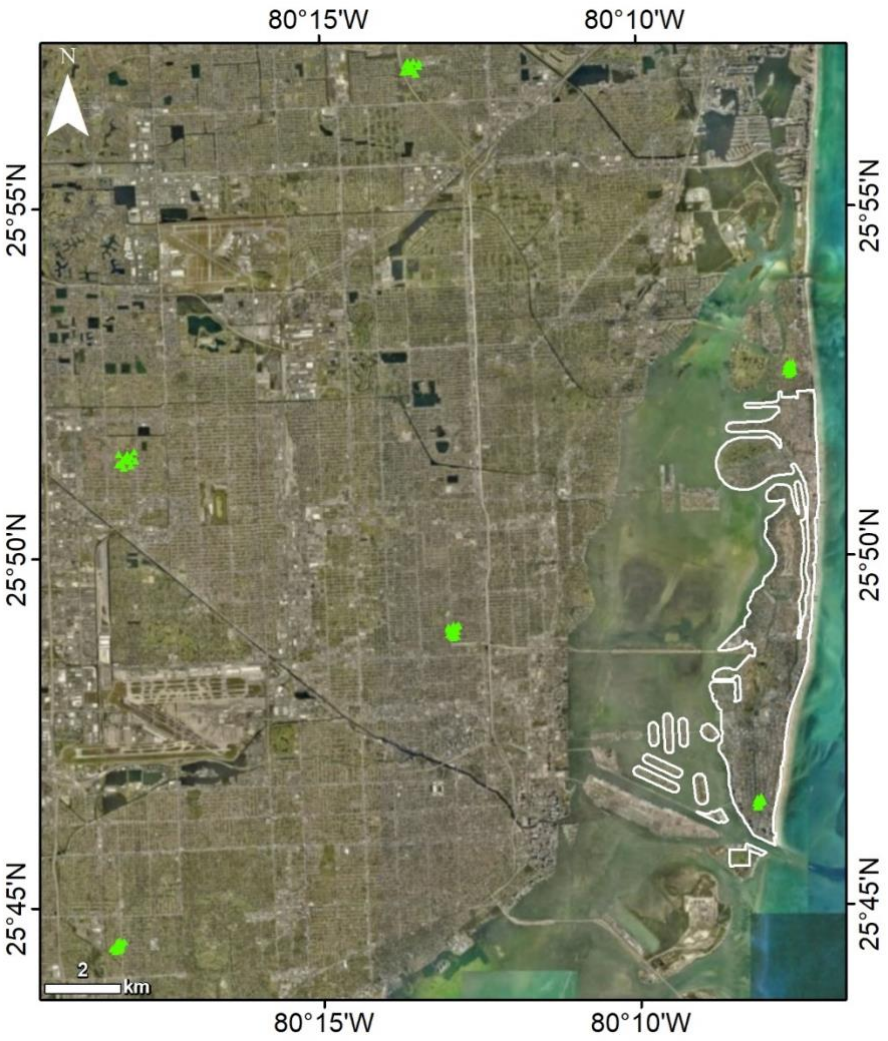


Figure S2. Map showing the locations of the ground control points used for Miami Beach. The ground control points are placed in areas that satisfy the following criteria: should not present phase fringes related to residual topography and to significant displacements in the unwrapped interferograms; should not present unwrapping errors, and hence should have high coherent targets; should be well distributed in the SAR scene. The large number (>30) of ground control points is also necessary to reduce the errors in the estimation of the displacement velocity due to a misplaced single reference point. The white polygon shows the boundary of the Miami Beach municipality. Base image source: Esri, DigitalGlobe, GeoEye, Earth Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

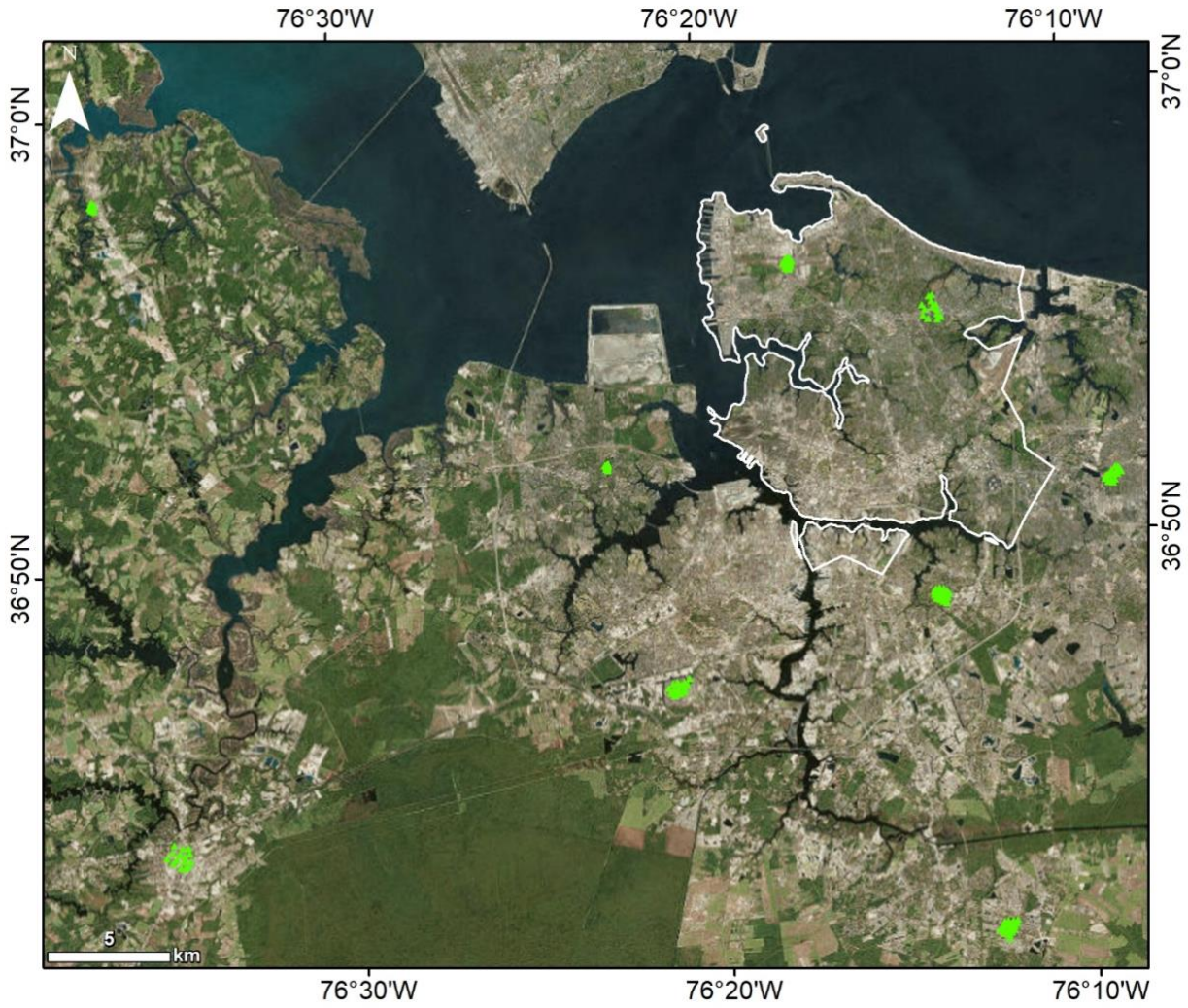


Figure S3. Map showing the locations of the ground control points used for Norfolk (VA). The ground control points are placed in areas that satisfy the following criteria: should not present phase fringes related to residual topography and to significant displacements in the unwrapped interferograms; should not present unwrapping errors, and hence should have high coherent targets; should be well distributed in the SAR scene. The large number (>30) of ground control points is also necessary to reduce the errors in the estimation of the displacement velocity due to a misplaced single reference point. The white polygon shows the boundary of the Norfolk municipality. Base image source: Esri, DigitalGlobe, GeoEye, Earth Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

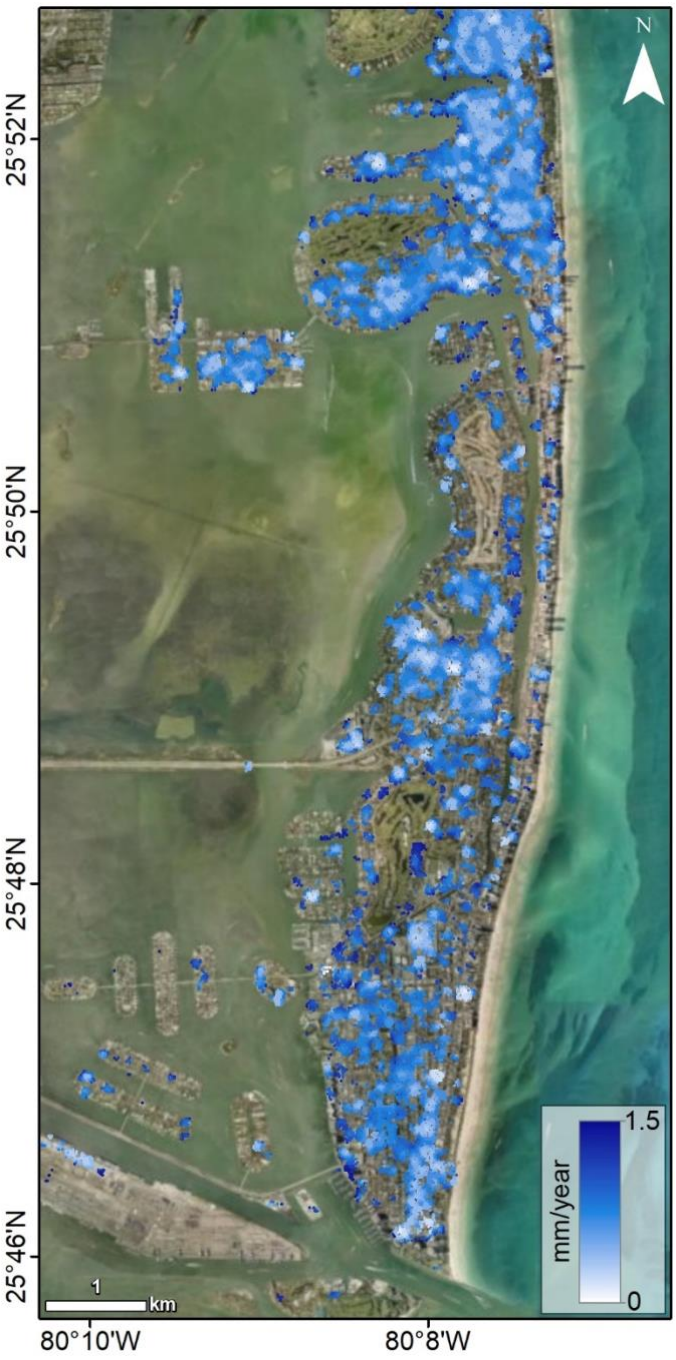


Figure S4. Uncertainty map of the mean velocities obtained over Miami Beach. Base image source: Esri, DigitalGlobe, GeoEye, Earth Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

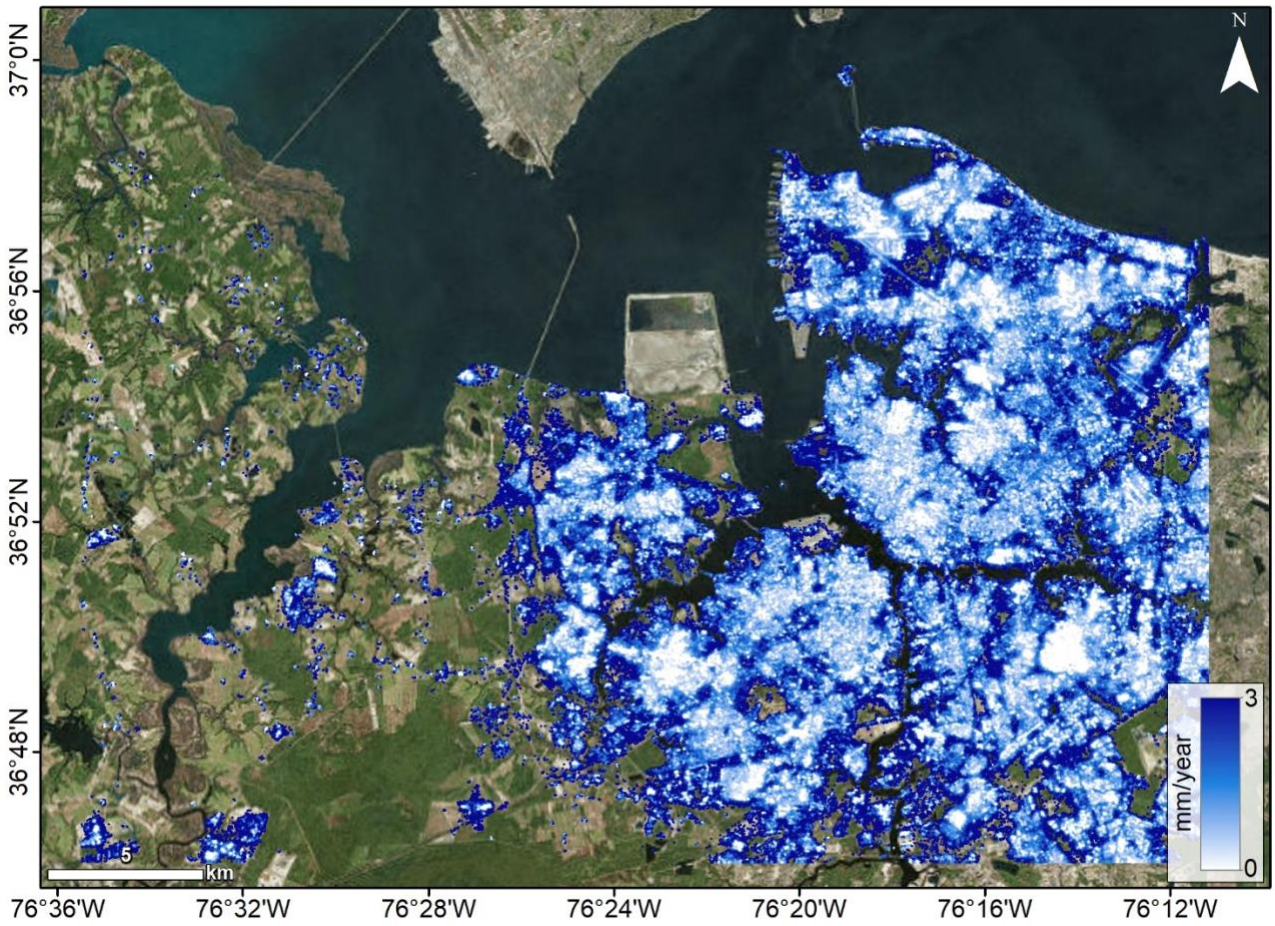


Figure S5. Uncertainty map of the mean velocities obtained over Norfolk (VA). Base image source: Esri, DigitalGlobe, GeoEye, Earth Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

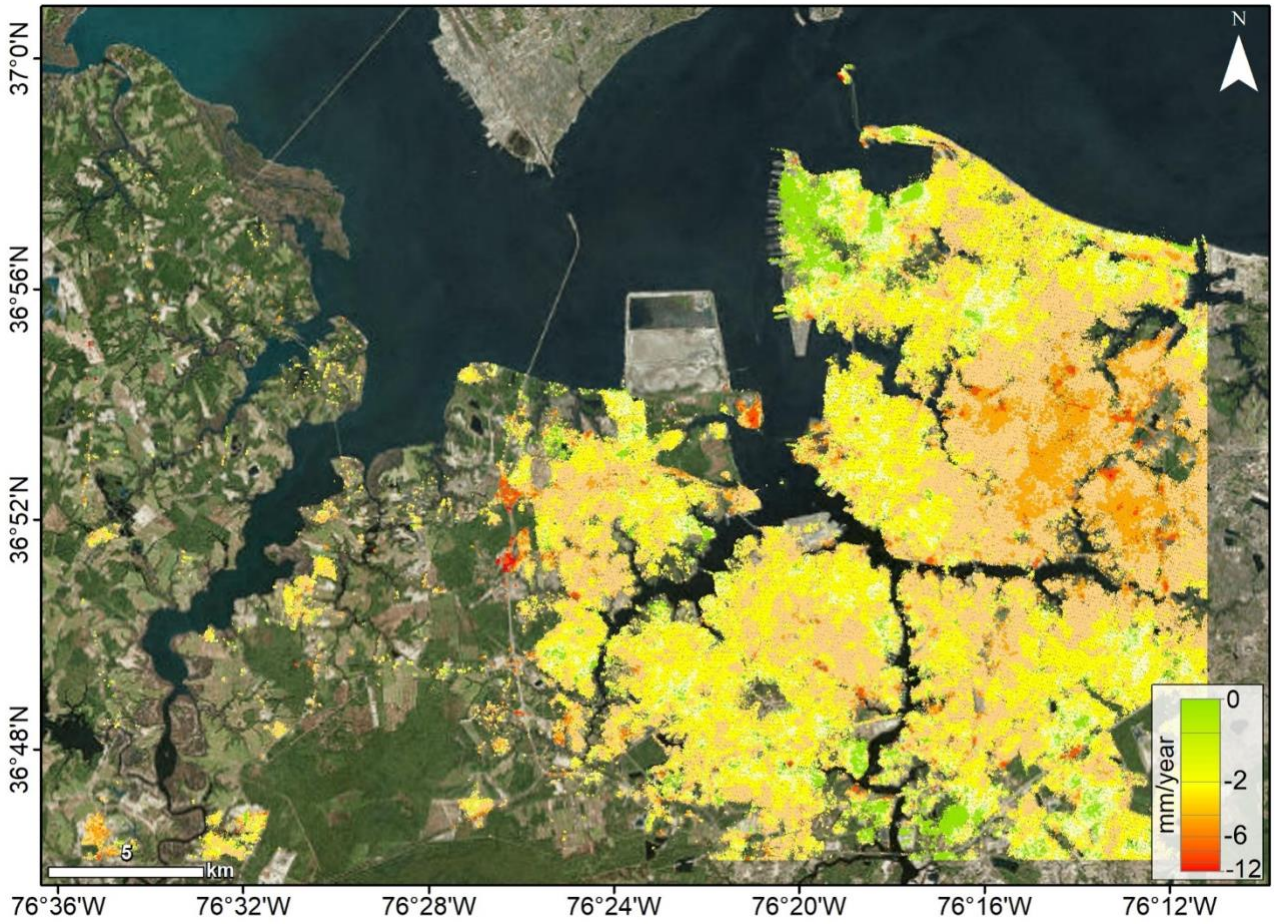


Figure S6. Total vertical velocity map over Norfolk (VA) from 1992 to 1998. The total subsidence component in the area is obtained by correcting the relative InSAR velocities with the regional rates obtained from the LOY2 GPS station (-1.7±0.9 mm/yr). Base image source: Esri, DigitalGlobe, GeoEye, Earth Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.