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Supplement of

Glacier changes in the Karakoram region mapped by multimission satellite imagery

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1 **Glacier changes in the Karakoram region mapped by multi-**
 2 **mission satellite imagery: Supplement Material**

3

4 Supplementary Table S 1. List of Landsat data used in this study.

Landsat no.	Landsat path/row	scene date			
			5	149-036	1992/10/15
			5	150-035	1998/08/04
1	160-035	1972/11/17	7	149-035	1998/08/13
2	160-035	1976/08/25	5	150-034	1998/08/20
2	158-036	1976/09/10	5	149-035	1998/08/29
2	159-035	1976/09/11	5	148-035	1998/09/07
2	160-035	1976/10/18	5	147-036	1998/09/16
2	159-035	1976/11/04	7	147-036	1998/09/16
2	159-035	1976/12/10	7	148-035	1999/06/30
2	162-035	1977/06/29	7	148-035	1999/07/16
2	162-034	1977/07/17	5	149-035	1999/08/16
2	159-035	1977/08/01	7	149-035	1999/10/11
2	161-035	1977/08/03	7	147-036	1999/10/29
2	160-035	1977/08/20	7	147-035	1999/12/16
2	161-035	1977/09/26	7	147-036	1999/12/16
2	159-035	1978/06/21	7	148-035	1999/12/23
3	160-035	1978/07/01	5	149-035	2000/02/08
3	159-035	1978/07/18	5	147-036	2000/03/29
3	160-035	1978/07/19	5	149-034	2000/05/14
3	159-035	1979/07/31	5	148-035	2000/08/27
3	160-035	1979/08/19	7	148-035	2000/09/04
3	160-035	1979/09/06	7	149-035	2000/09/11
3	161-034	1981/09/14	7	149-035	2000/10/13
5	148-035	1990/06/29	7	149-035	2001/01/01
5	149-035	1992/10/15	7	147-036	2001/06/28

Supplementary Table S1 continued.

7	148-035	2001/09/23	7	149-035	2005/10/27
7	149-034	2001/09/30	7	147-036	2005/10/29
7	149-035	2001/09/30	7	149-034	2006/04/05
7	149-035	2001/10/01	7	148-035	2006/05/16
7	147-035	2001/10/02	7	149-035	2006/07/26
7	150-035	2001/10/07	7	148-035	2006/08/20
7	148-035	2001/10/09	7	148-035	2006/09/05
7	148-035	2002/06/22	7	149-035	2006/09/28
7	147-036	2002/08/02	7	147-036	2006/09/30
7	148-035	2002/08/09	7	148-035	2006/10/07
7	149-035	2002/08/16	7	149-034	2007/07/29
7	149-035	2002/10/03	7	149-035	2007/07/29
7	149-036	2002/10/03	7	148-035	2007/09/08
7	148-035	2002/10/12	7	149-035	2007/09/15
7	147-036	2002/11/22	7	147-036	2007/10/19
7	149-034	2003/07/18	7	148-035	2007/11/27
7	147-036	2003/07/20	7	148-035	2008/05/21
7	149-035	2003/09/20	7	148-035	2008/06/06
7	148-035	2003/10/15	7	149-034	2008/07/31
7	149-034	2004/03/30	7	148-035	2008/09/10
7	148-035	2004/06/11	7	148-035	2008/09/26
7	149-035	2004/08/05	7	149-035	2008/10/03
7	148-035	2004/08/14	7	147-036	2008/10/05
7	147-036	2004/09/08	7	148-035	2009/07/27
7	148-035	2004/09/15	5	148-035	2009/08/04
7	149-035	2004/10/24	5	149-034	2009/08/11
7	149-034	2005/04/18	5	149-035	2009/08/11
7	149-035	2005/06/21	7	148-035	2009/08/12
7	148-035	2005/09/02	5	147-035	2009/08/13

Supplementary Table S1 continued.

5	147-036	2009/08/13	7	148-035	2011/10/21
5	149-035	2009/08/27	7	147-036	2012/01/02
5	150-035	2009/09/19	7	149-035	2012/02/01
7	149-035	2009/09/20	7	148-035	2012/03/29
7	148-035	2009/09/29	7	147-036	2012/11/12
7	147-036	2009/10/24	8	147-036	2013/06/21
7	148-035	2009/12/02	8	149-034	2013/07/21
5	149-034	2009/12/17	8	147-036	2013/07/23
5	149-034	2010/01/17	8	150-035	2013/07/28
5	148-035	2010/05/03	8	148-035	2013/07/30
5	148-035	2010/06/20	8	149-035	2013/09/07
5	148-036	2010/06/20			
5	149-035	2010/06/27			
5	148-035	2010/08/23			
5	147-036	2010/09/17			
7	148-035	2010/10/02			
7	149-035	2010/10/09			
5	149-036	2010/10/17			
5	148-035	2010/11/11			
7	148-035	2011/01/22			
5	150-035	2011/05/04			
5	149-035	2011/05/29			
5	147-035	2011/05/31			
5	147-036	2011/08/03			
5	148-035	2011/08/10			
5	149-035	2011/08/17			
7	149-034	2011/10/12			
7	149-035	2011/10/12			

1 Supplementary Table S 2. List of TerraSAR-X data used in this study.

sensor	scene date	orbit	strip	ascending/descending
TerraSAR-X	2009/06/16	098	008	A
TerraSAR-X	2009/08/03	151	009	D
TerraSAR-X	2009/12/24	151	009	D
TerraSAR-X	2009/19/12	098	008	A
TerraSAR-X	2010/01/15	151	009	D
TerraSAR-X	2011/03/09	151	010	D
TerraSAR-X	2011/03/31	151	010	D
TerraSAR-X	2013/06/11	151	010	D
TerraSAR-X	2013/06/22	151	010	D

2

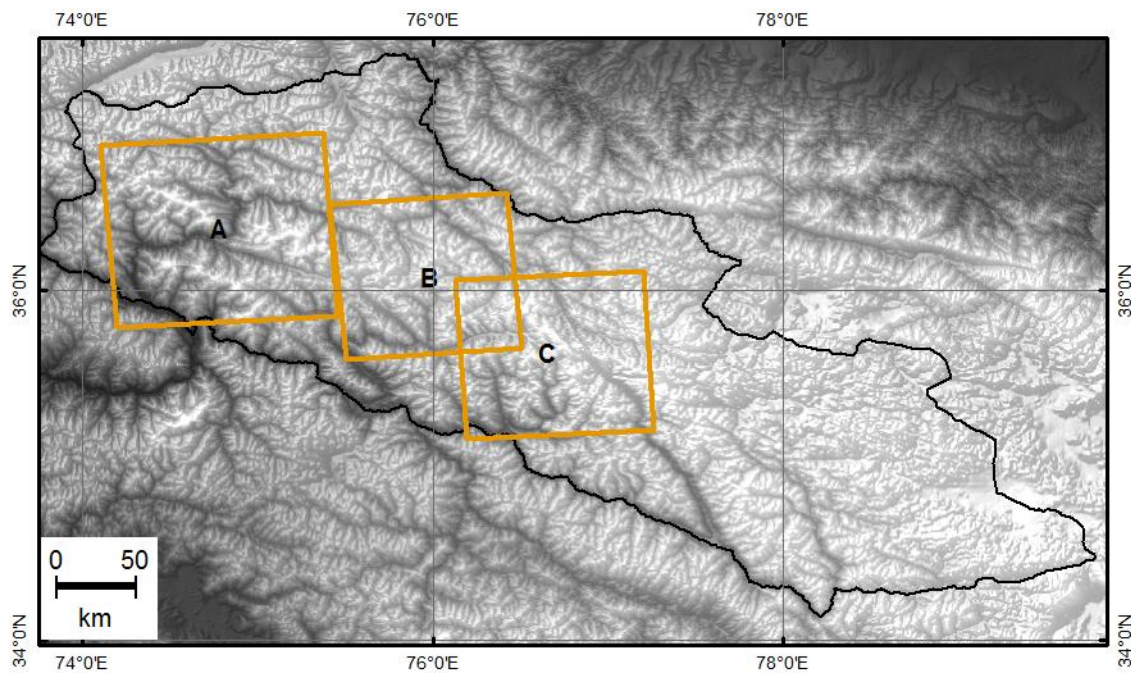
1 Supplementary Table S 3. List of ALOS PALSAR data used in this study.

sensor	scene date	orbit	track	frame	ascending/descending
ALOS PALSAR	2006/05/17	01658	532	720	A
ALOS PALSAR	2006/05/17	01658	532	710	A
ALOS PALSAR	2006/05/17	01658	532	700	A
ALOS PALSAR	2006/07/02	02329	532	700	A
ALOS PALSAR	2006/07/02	02329	532	710	A
ALOS PALSAR	2006/07/02	02329	532	720	A
ALOS PALSAR	2006/12/28	04940	527	710	A
ALOS PALSAR	2006/12/28	04940	527	720	A
ALOS PALSAR	2007/02/12	05611	527	720	A
ALOS PALSAR	2007/06/13	07376	526	710	A
ALOS PALSAR	2007/07/29	78047	526	710	A
ALOS PALSAR	2008/01/12	10483	525	710	A
ALOS PALSAR	2008/02/27	11154	525	710	A
ALOS PALSAR	2008/11/17	15005	527	720	A
ALOS PALSAR	2008/12/11	15355	523	700	A
ALOS PALSAR	2008/12/11	15355	523	690	A
ALOS PALSAR	2009/01/02	15676	527	710	D
ALOS PALSAR	2009/01/02	15676	527	720	D
ALOS PALSAR	2009/01/14	15851	525	710	A
ALOS PALSAR	2009/01/26	16026	523	700	A
ALOS PALSAR	2009/01/26	16026	523	690	A
ALOS PALSAR	2009/02/17	16347	527	710	D
ALOS PALSAR	2009/02/17	16347	527	720	D
ALOS PALSAR	2009/03/01	16522	525	710	A

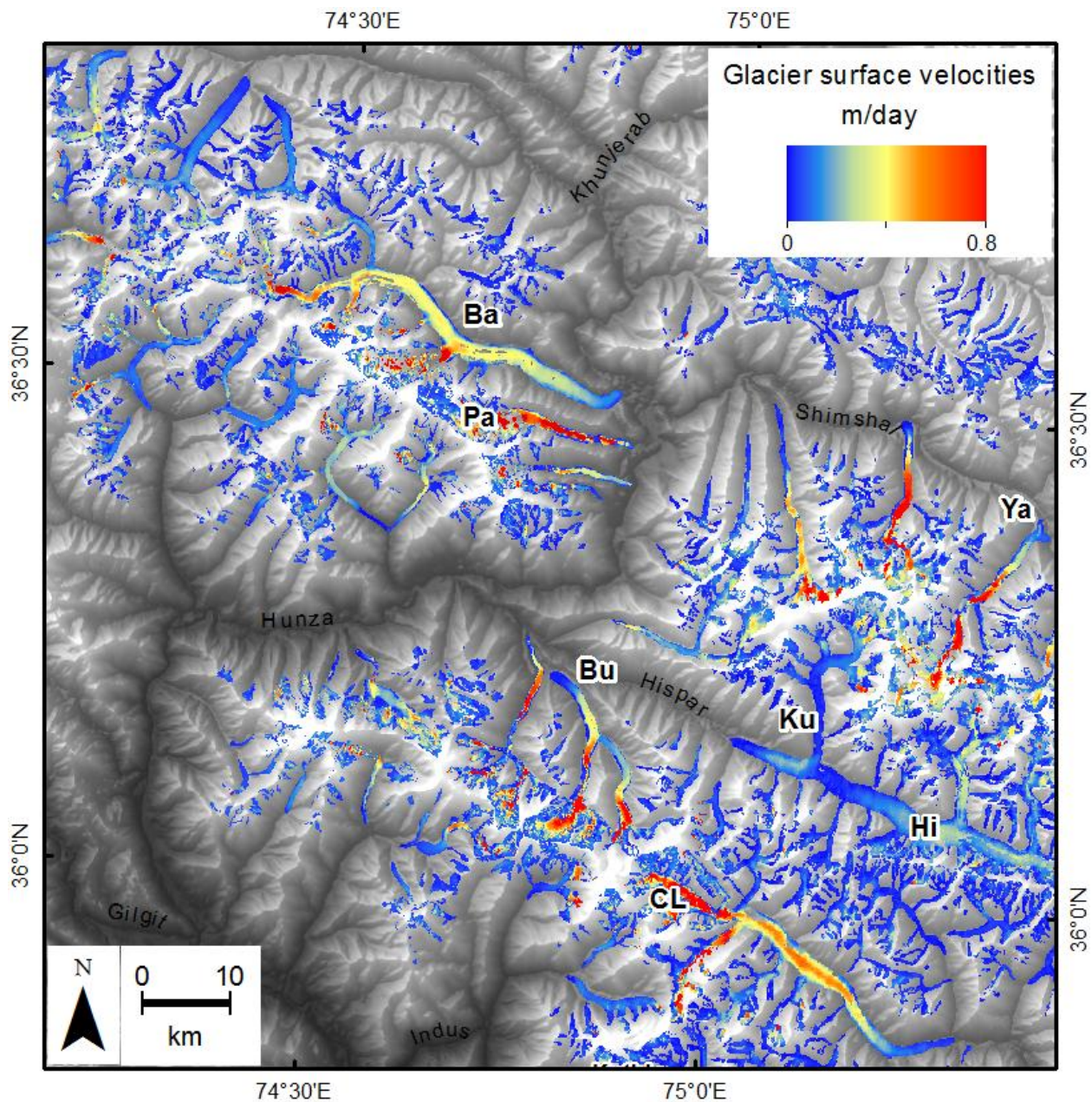
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1 Supplementary Table S 4. List of ERS and ENVISAT data used in this study.

sensor	scene date	orbit	track	ascending/descending
ERS SAR	1992/09/29	6305	148	D
ERS SAR	1992/10/15	6534	377	D
ERS SAR	1992/11/03	6806	148	D
ERS SAR	1992/11/19	7035	377	D
ERS SAR	1992/12/14	7393	377	D
ERS SAR	1993/01/31	8080	420	D
ERS SAR	1993/03/07	8581	420	D
ENVISAT ASAR	2003/08/03	7445	377	D
ENVISAT ASAR	2003/10/12	8447	377	D
ENVISAT ASAR	2003/11/03	8762	191	D
ENVISAT ASAR	2003/12/08	9263	191	D
ENVISAT ASAR	2011/08/11	49401	249	D
ENVISAT ASAR	2011/08/19	49516	364	D
ENVISAT ASAR	2011/08/22	49559	407	D
ENVISAT ASAR	2011/08/30	49674	091	D
ENVISAT ASAR	2011/09/10	49832	249	D
ENVISAT ASAR	2011/09/18	49947	364	D
ENVISAT ASAR	2011/09/21	49990	407	D
ENVISAT ASAR	2011/09/29	50105	091	D

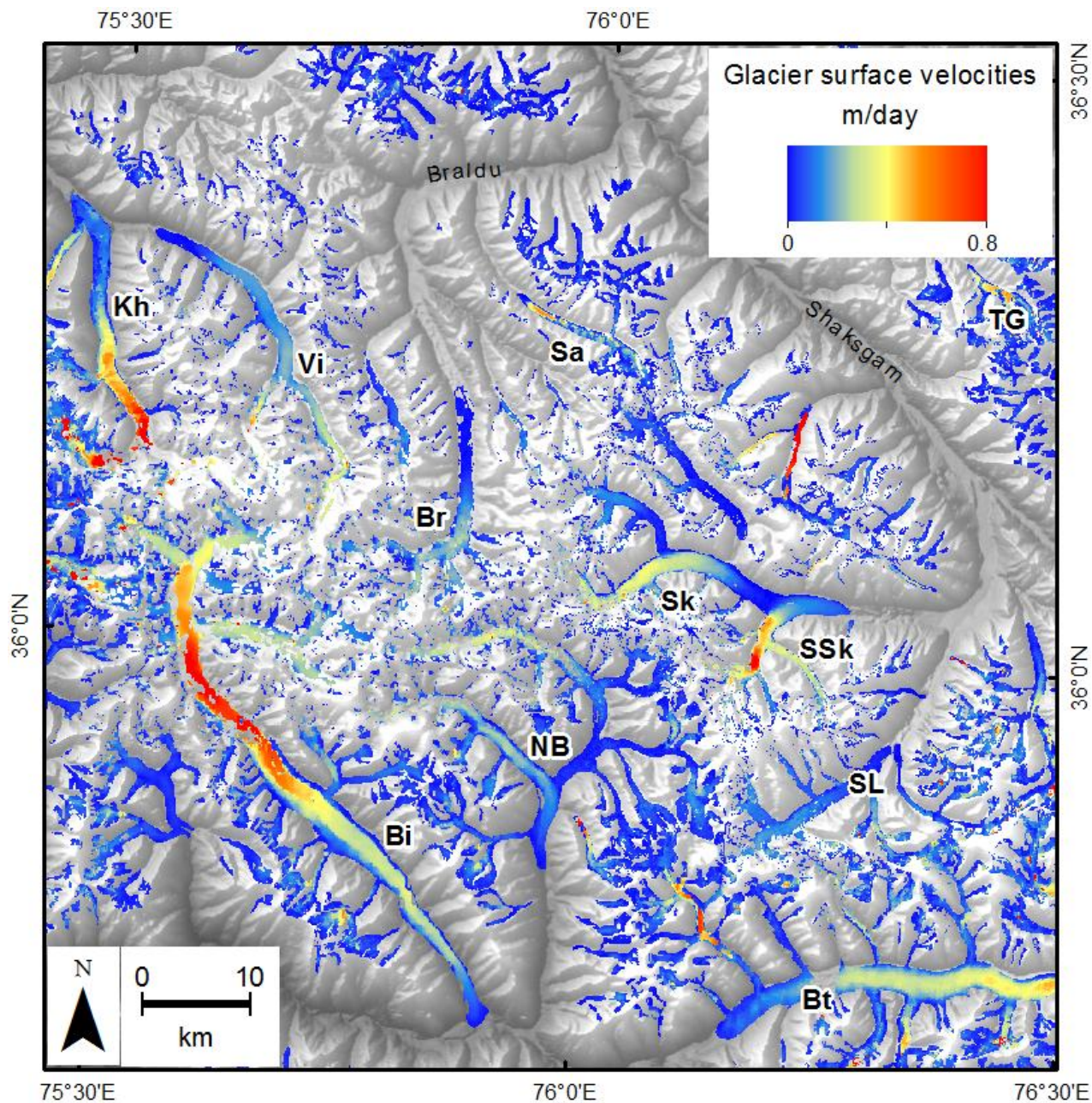


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- 2 Supplementary Figure S 1. Overview of velocity subsets shown in Supplementary Figure S 2,
- 3 Supplementary Figure S 3, and Supplementary Figure S 4.

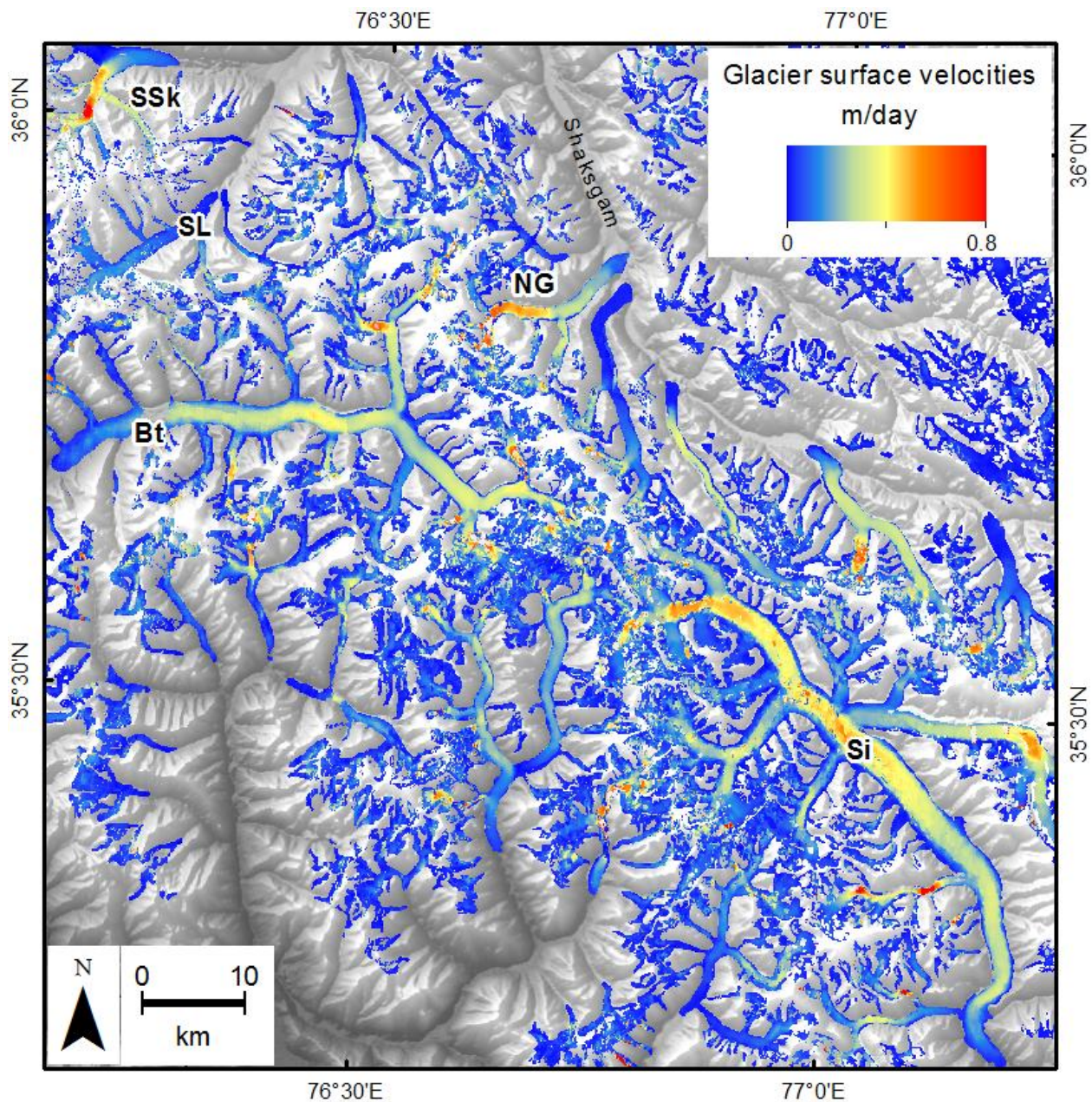


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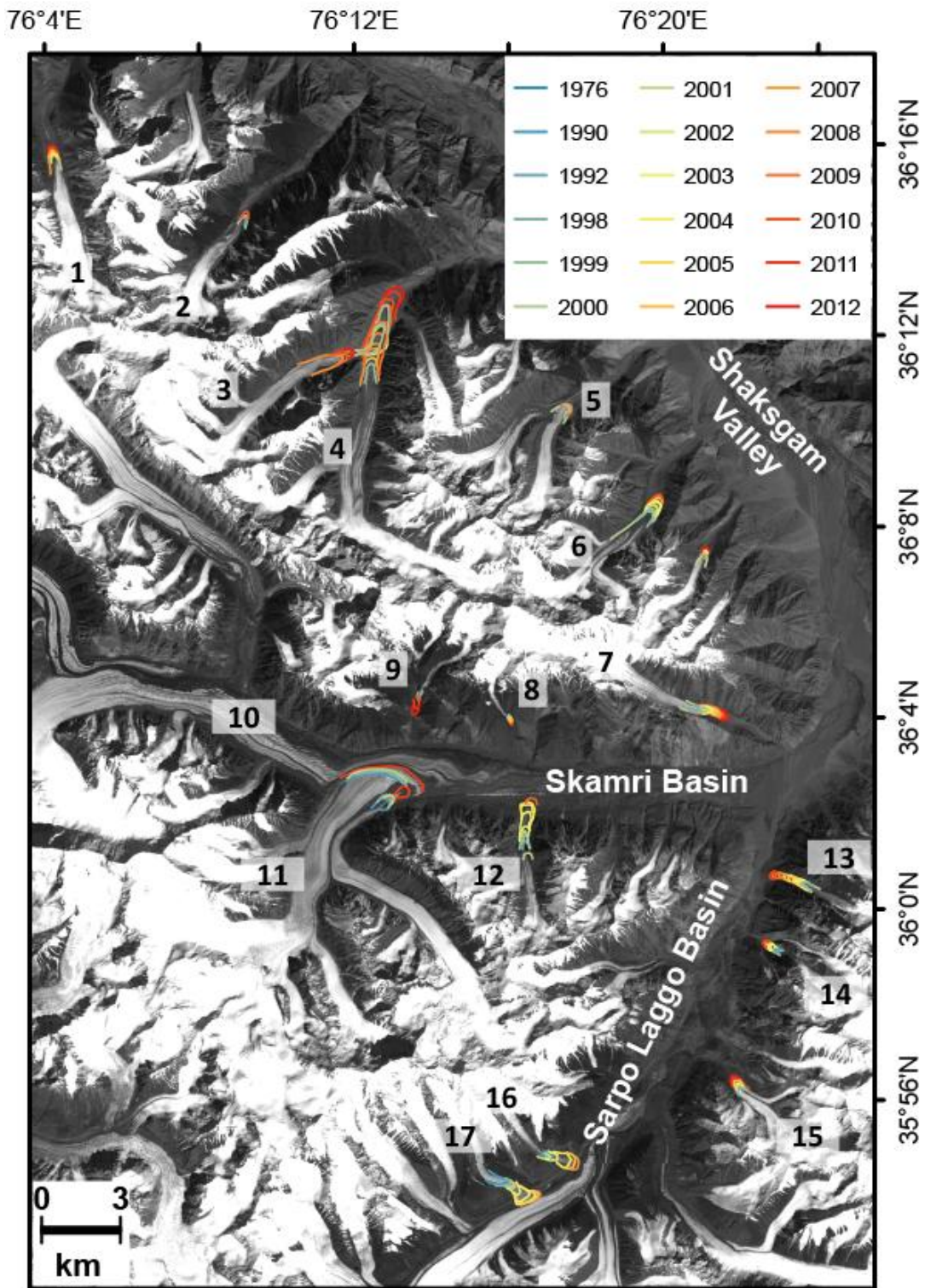
2 Supplementary Figure S 2. Compiled surface velocities mosaic of the Karakoram Range between 2007
 3 and 2011 from TerraSAR-X, ALOS PALSAR, and ENVISAT ASAR; subset A. Abbreviations: Ba =
 4 Batura Glacier, Bi = Biafo, Br = Braldu, Bt = Baltoro, Bu = Barpu, CL = Chogo Lungma, Hi = Hispar,
 5 Kh = Khurdopin, Ku = Kunyang, NB = Nobande Sobonde (Panmah), NG = North Gasherbrum, PA =
 6 Pasu, Sa = Saxinitulu, Si = Siachen, SK = Skamri, SL = Sarpo Laggo, SSk = South Skamri, TG =
 7 Tatulu Gou, Vi = Virjerab, Ya = Yazghil.



2 Supplementary Figure S 3. Compiled surface velocities mosaic of the Karakoram Range between 2007
 3 and 2011 from TerraSAR-X, ALOS PALSAR, and ENVISAT ASAR; subset B. Abbreviations: Ba =
 4 Batura Glacier, Bi = Biafo, Br = Braldu, Bt = Baltoro, Bu = Barpu, CL = Chogo Lungma, Hi = Hispar,
 5 Kh = Khurdopin, Ku = Kunyang, NB = Nobande Sobonde (Panmah), NG = North Gasherbrum, PA =
 6 Pasu, Sa = Saxinitulu, Si = Siachen, SK = Skamri, SL = Sarpo Laggo, SSk = South Skamri, TG =
 7 Tatulu Gou, Vi = Virjerab, Ya = Yazghil.



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 2 Supplementary Figure S 4. Compiled surface velocities mosaic of the Karakoram Range between 2007
 3 and 2011 from TerraSAR-X, ALOS PALSAR, and ENVISAT ASAR; subset C. Abbreviations: Ba =
 4 Batura Glacier, Bi = Biafo, Br = Braldu, Bt = Baltoro, Bu = Barpu, CL = Chogo Lungma, Hi = Hispar,
 5 Kh = Khurdopin, Ku = Kunyang, NB = Nobande Sobonde (Panmah), NG = North Gasherbrum, PA =
 6 Pasu, Sa = Saxinitulu, Si = Siachen, SK = Skamri, SL = Sarpo Lago, SSk = South Skamri, TG =
 7 Tatulu Gou, Vi = Virjerab, Ya = Yazghil.



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2 Supplementary Figure S 5. Glacier termini positions in the Shaksgam Valley, Sarpo Laggo and Skamri
3 Basin between 1976 and 2012.