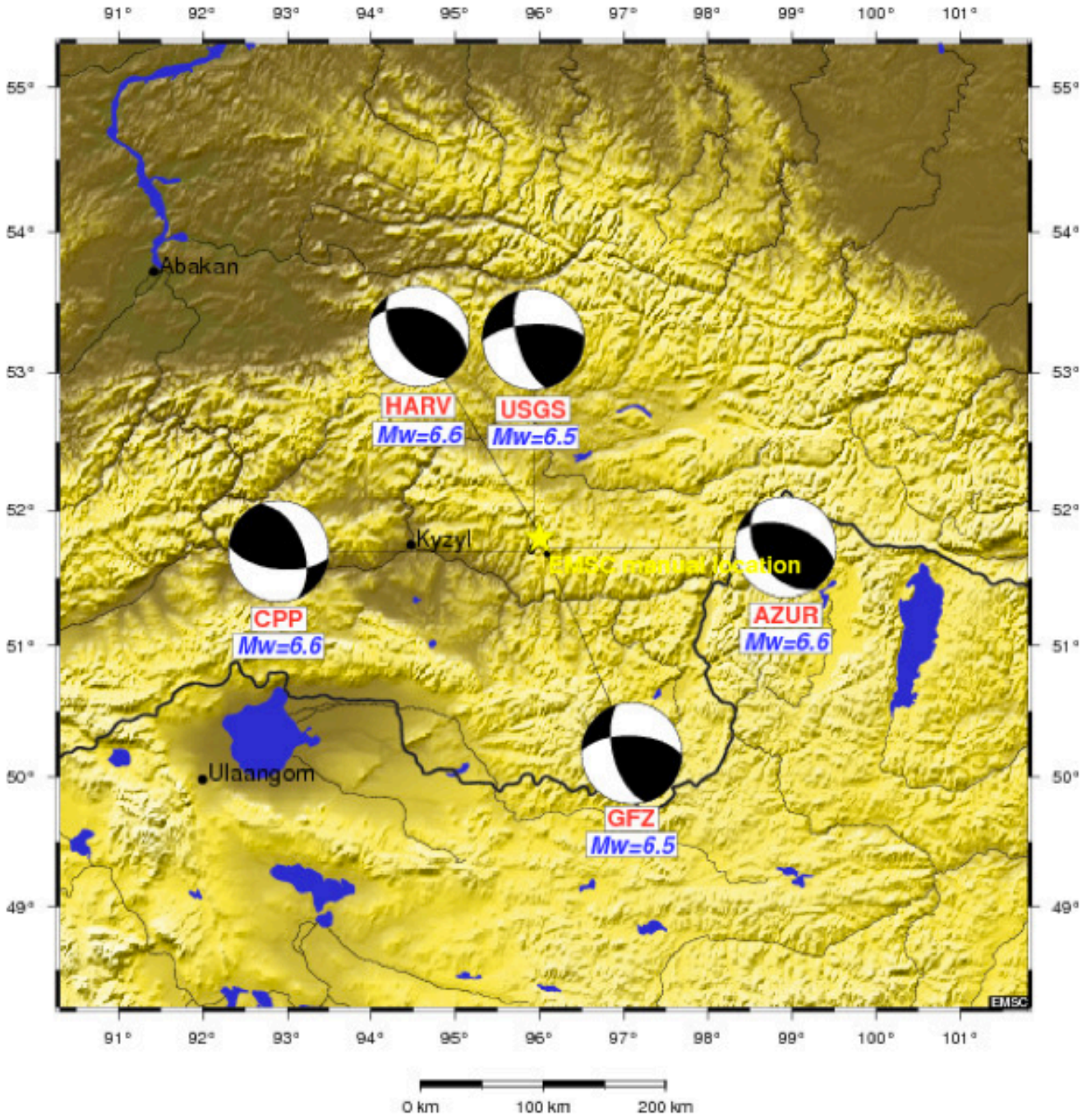
Russian Earthquake & background

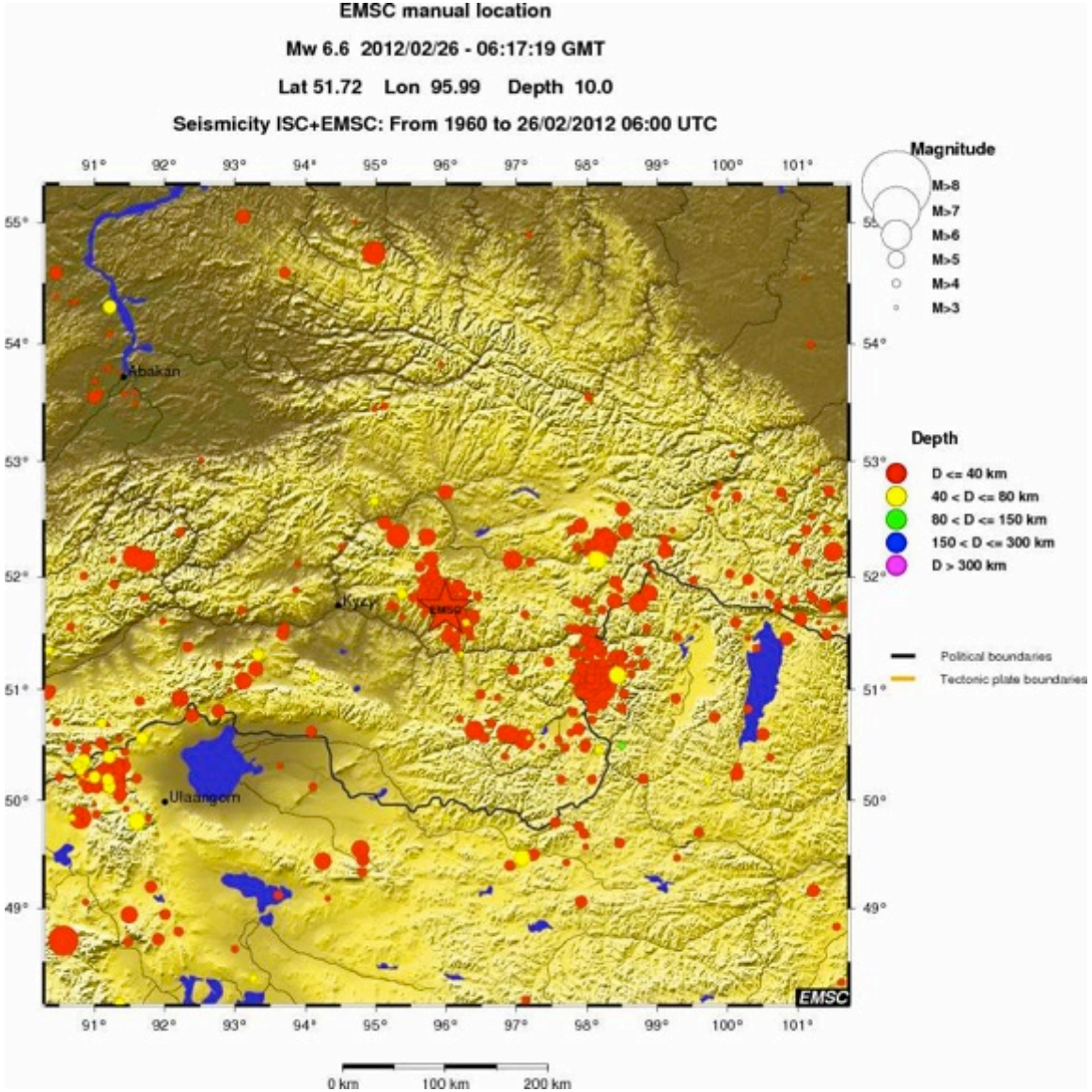
2012-03-02

Earthquake Information

- Magnitude: 6.7
- Date: February 26, 2012
- Time: 02:34:59
- Location: 51.731 N, 95.921 E
- Depth: 11.7 km

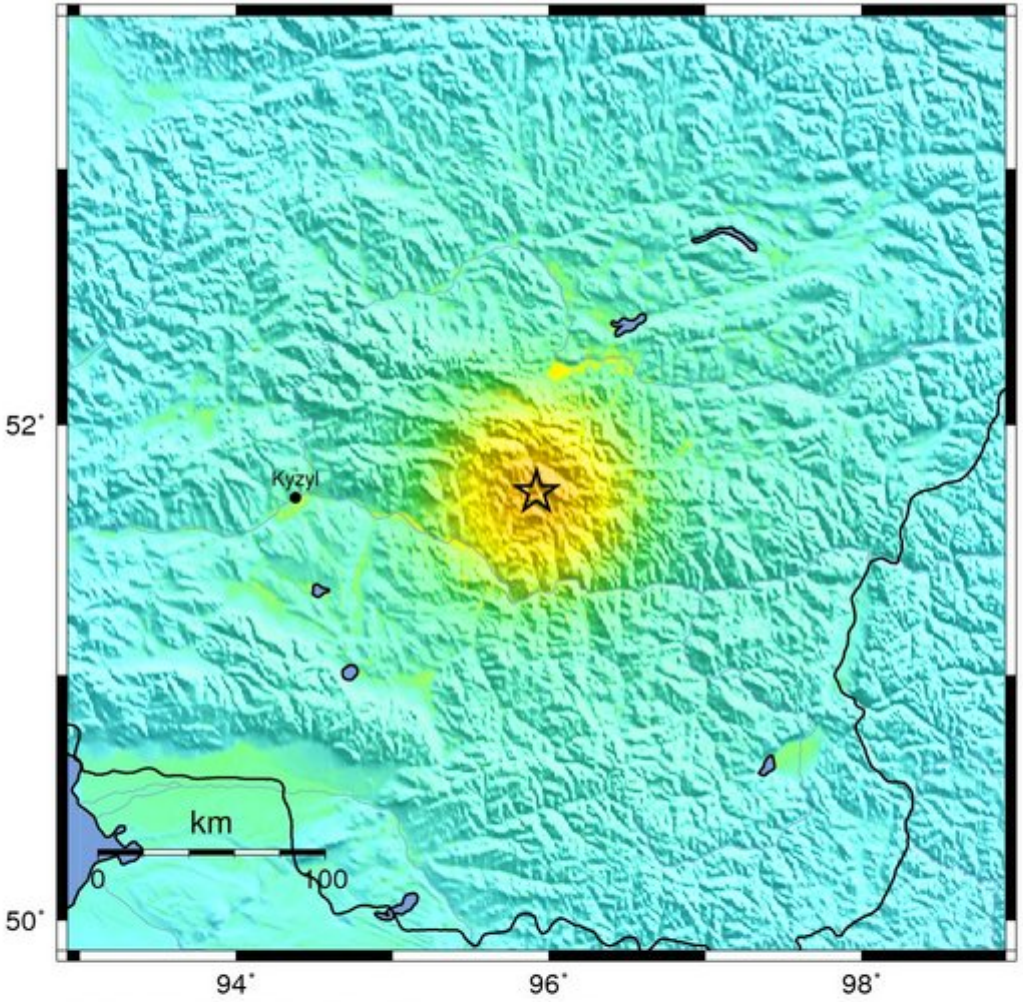
Earthquake Location


91°
92°
93°
94°
95°
96°
97°
98°
99°
100°
101°
55°
54°
53°
52°
51°
50°
49°
Abakan
HARV
Mw=6.6
USGS
Mw=6.5
Kyzyl
EMSC manual location
CPP
Mw=6.6
AZUR
Mw=6.6
Ulaangom
GFZ
Mw=6.5
EMSC
0 km
100 km
200 km


EMSC manual location
Mw 6.6 2012/02/26 - 06:17:19 GMT
Lat 51.72 Lon 95.99 Depth 10.0
Seismicity ISC+EMSC: From 1960 to 26/02/2012 06:00 UTC
Magnitude
M>8
M>7
M>6
M>5
M>4
M>3
Depth
D <= 40 km
40 < D <= 80 km
80 < D <= 150 km
150 < D <= 300 km
D > 300 km
Political boundaries
Tectonic plate boundaries
Abakan
Kyzyl
Ulaangom
EMSC
0 km
100 km
200 km

USGS ShakeMap : SOUTHWESTERN SIBERIA, RUSSIA

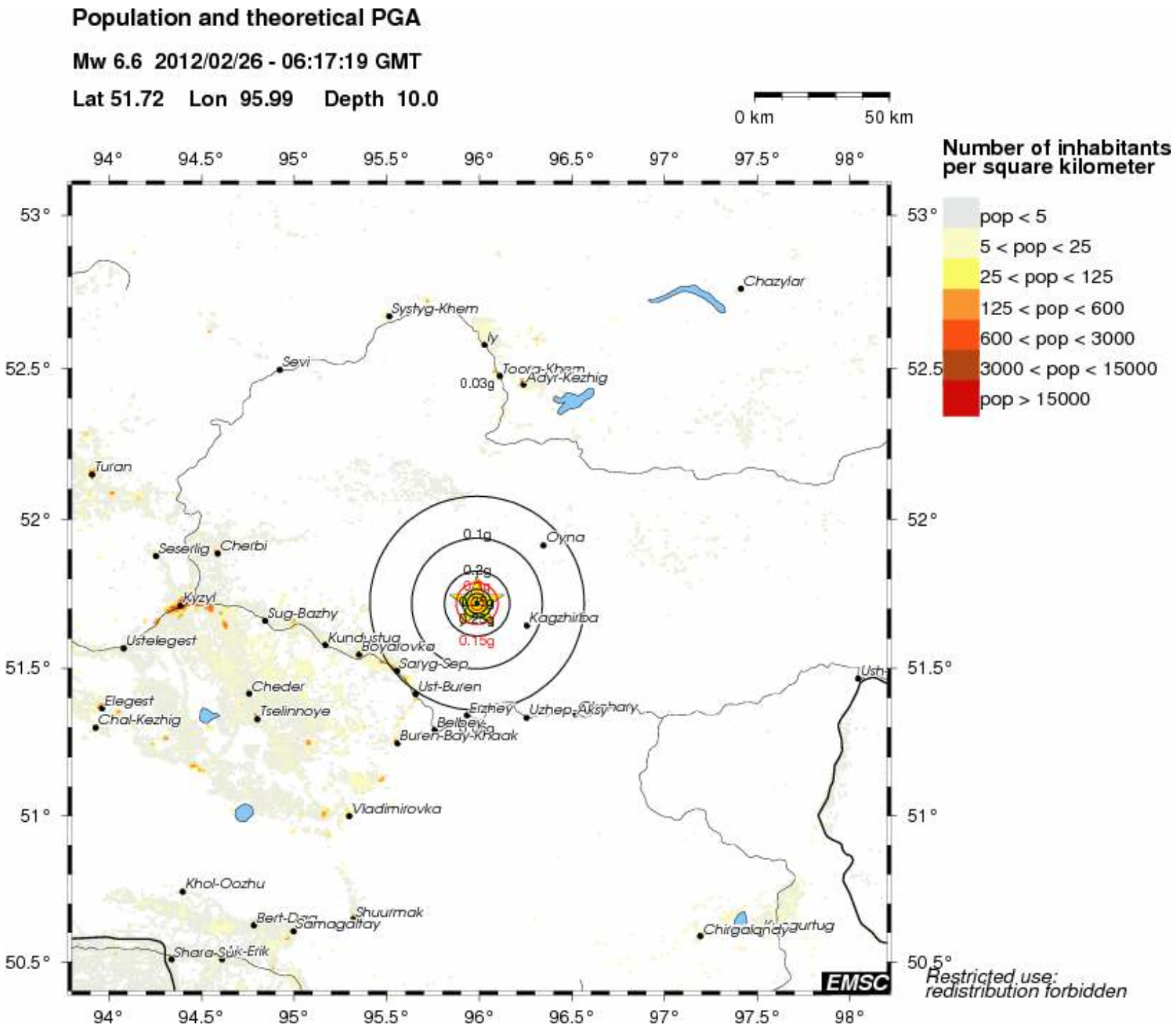
FEB 26 2012 06:17:19 AM GMT M 6.7 N51.73 E95.92 Depth: 11.7km ID:b0008672



Map Version 3 Processed Tue Feb 28, 2012 01:01:17 PM MST

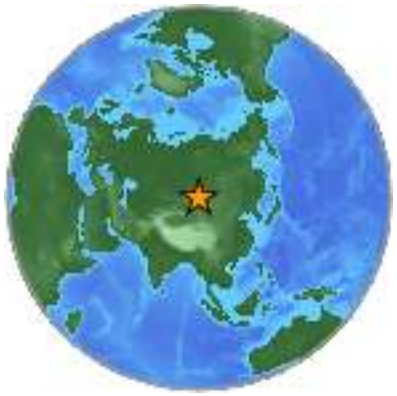
PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<0.03	0.3	2.8	6.2	12	22	40	75	>139
PEAK VEL.(cm/s)	*<0.01*	*0.1*	*1.4*	*4.7*	*9.6*	*20*	*41*	*86*	*>178*
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Worden et al. (2011)


Population and theoretical PGA
Mw 6.6 2012/02/26 - 06:17:19 GMT
Lat 51.72 Lon 95.99 Depth 10.0
0 km
50 km
Number of inhabitants per square kilometer
pop < 5
5 < pop < 25
25 < pop < 125
125 < pop < 600
600 < pop < 3000
3000 < pop < 15000
pop > 15000
94°
94.5°
95°
95.5°
96°
96.5°
97°
97.5°
98°
53°
52.5°
52°
51.5°
51°
50.5°
0.03g
0.1g
0.2g
0.15g
Chazylar
Systyg-Khem
Sevi
Toora-Khem
Adyr-Kezhig
Turan
Oyna
Seserlig
Cherbi
Kyzyl
Sug-Bazhy
Kagzhirba
Ustelegest
Kundustug
Boyalovka
Saryg-Sep
Ust-Buren
Cheder
Elegest
Chal-Kezhig
Tselinnoye
Erzhey
Uzhep-Aksy
Buren-Bay-Khaak
Vladimirovka
Khol-Oozhu
Bert-Dug
Samagaltay
Shuurmak
Shara-Sur-Erik
Chirgalanay
EMSC
Restricted use:
redistribution forbidden

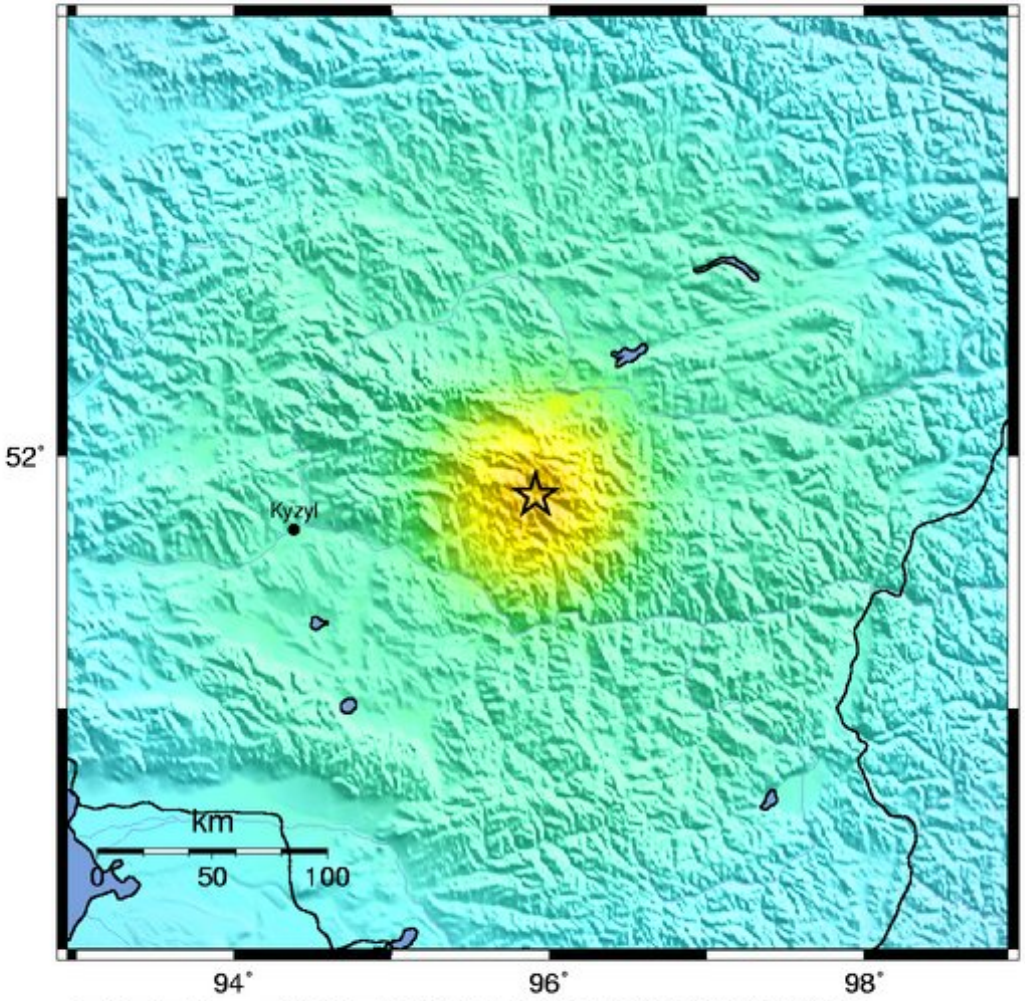
Earthquake Information

- Magnitude: 6.6
- Date: December 27, 2011
- Time: 15:21:56 UTC
- Location: 51.839 N, 95.921 E
- Depth: 15 km



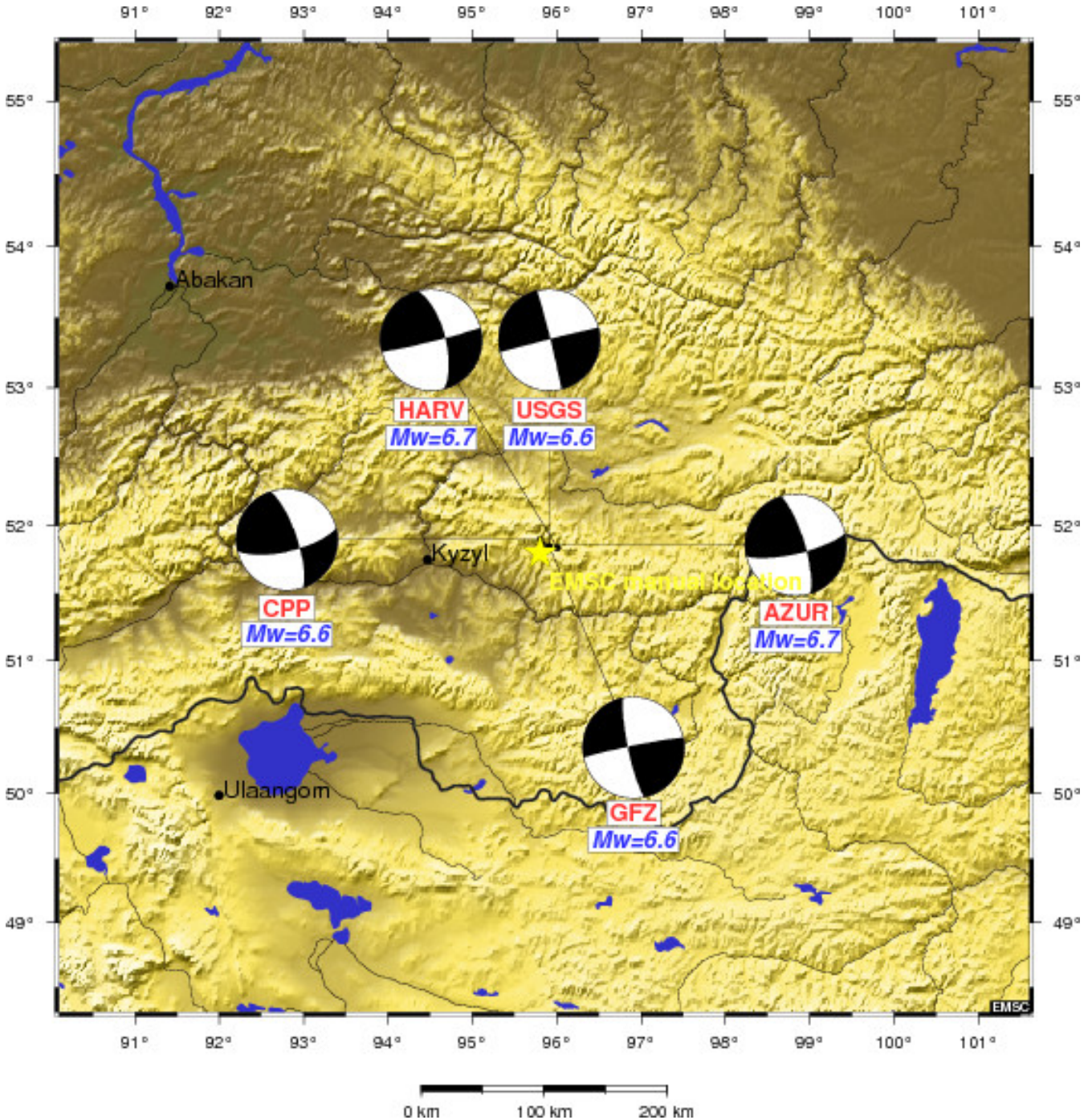
USGS ShakeMap : SOUTHWESTERN SIBERIA, RUSSIA

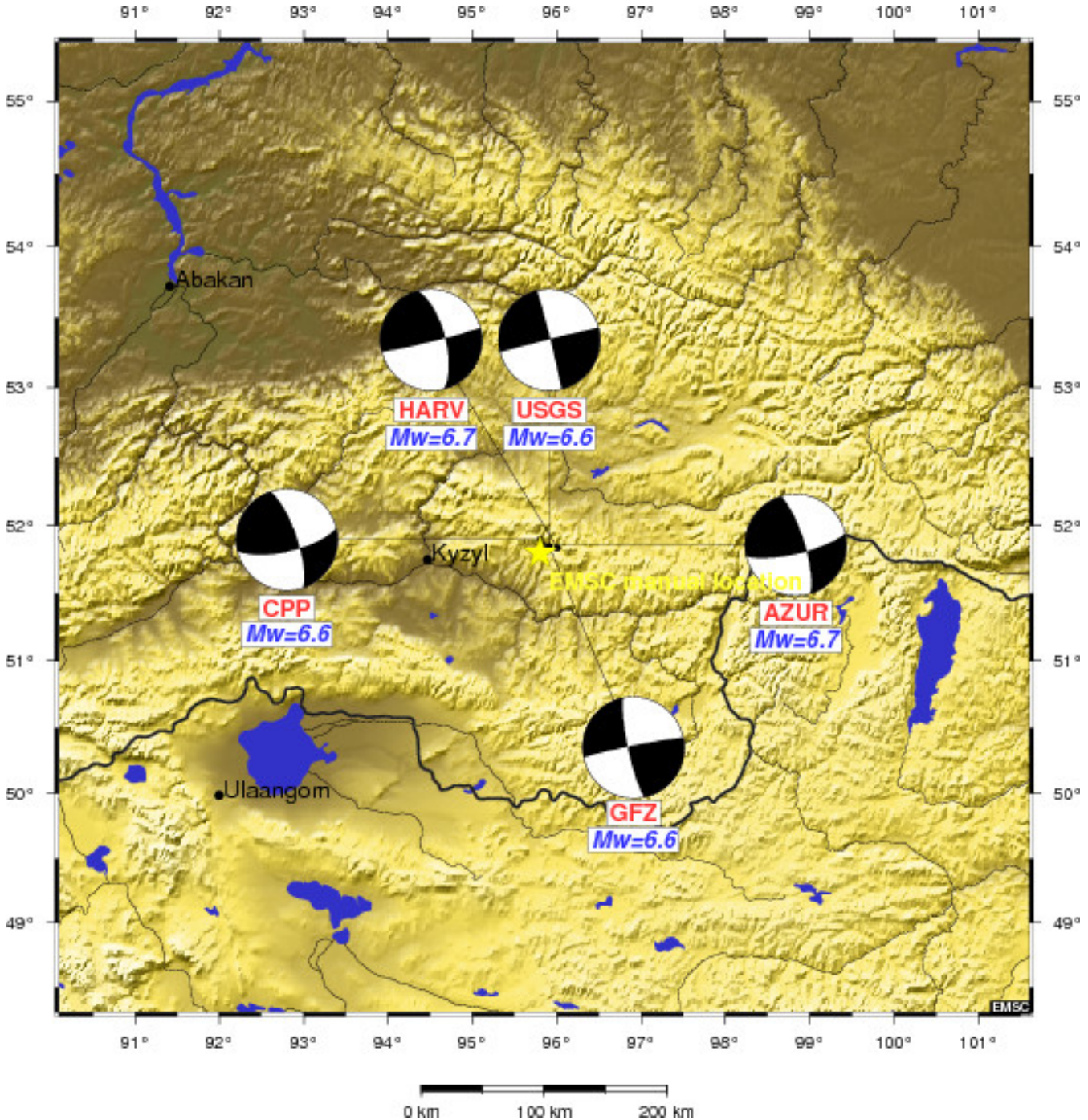
Tue Dec 27, 2011 15:21:56 GMT M 6.6 N51.84 E95.91 Depth: 15.1km ID:c0007dax

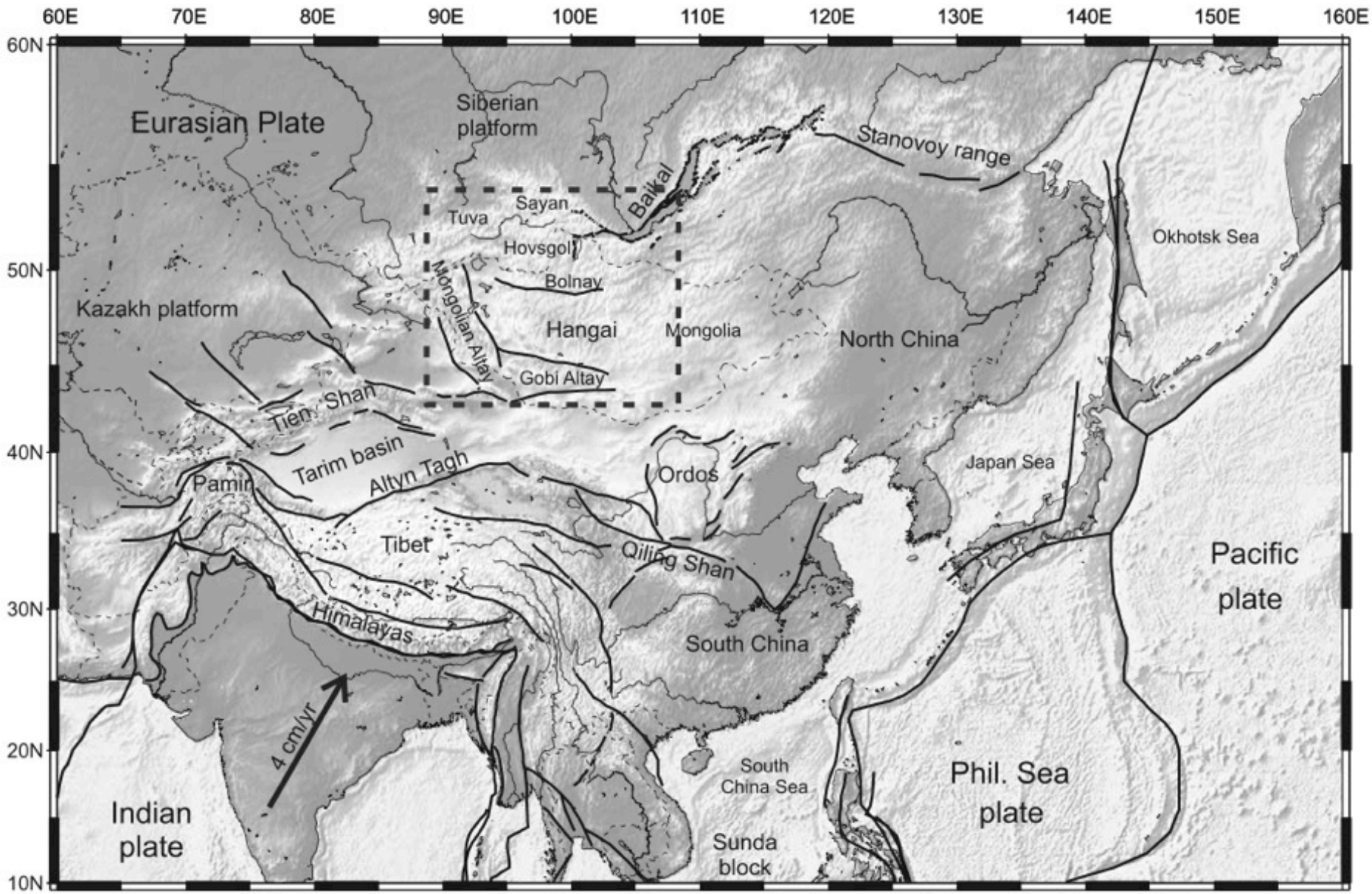


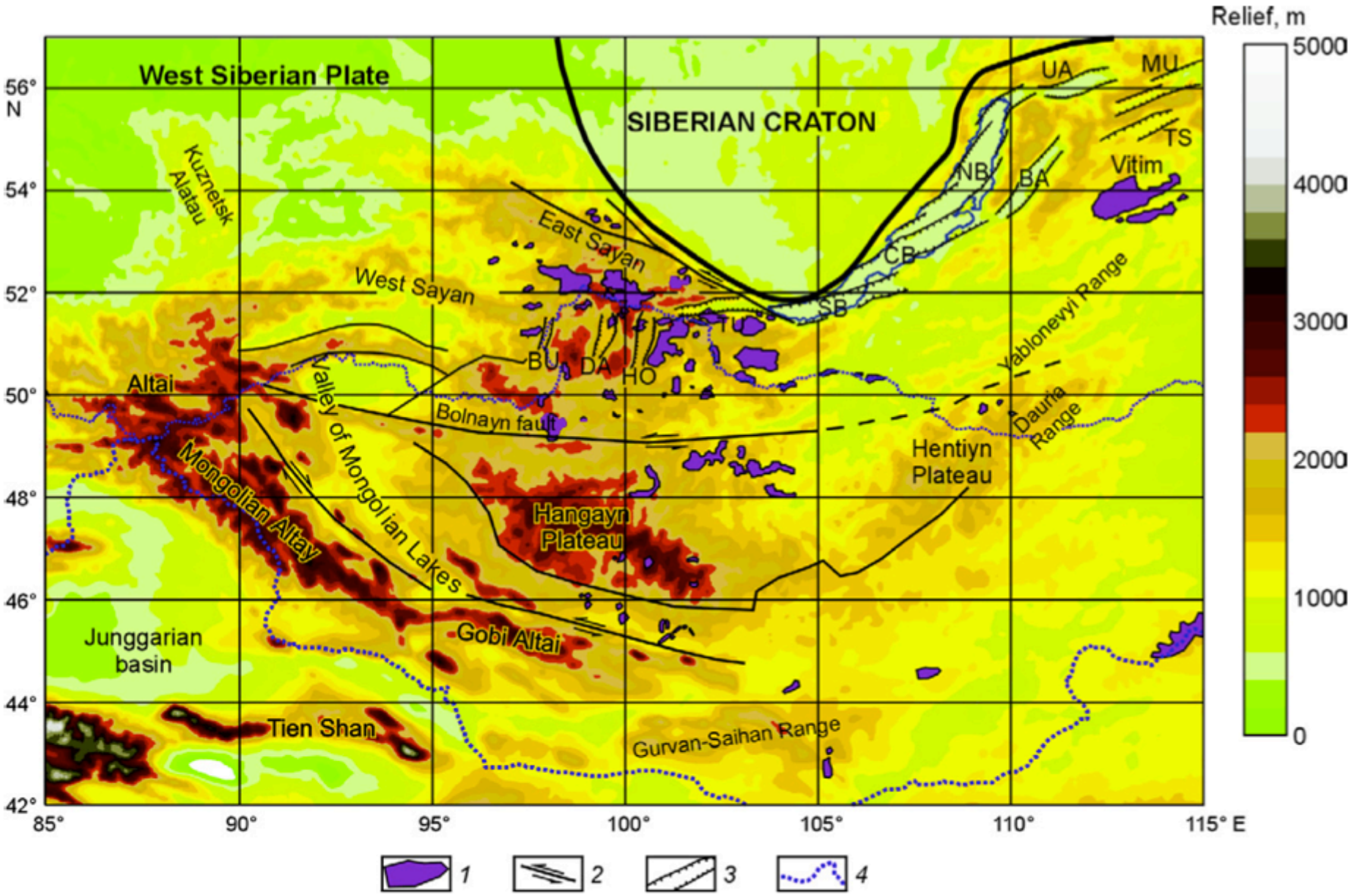
Map Version 2 Processed Wed Dec 28, 2011 02:12:25 PM MST – NOT REVIEWED BY HUMAN

PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	*<.17*	*.17-1.4*	*1.4-3.9*	*3.9-9.2*	*9.2-18*	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	*8.1-16*	*16-31*	*31-60*	*60-116*	*>116*
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

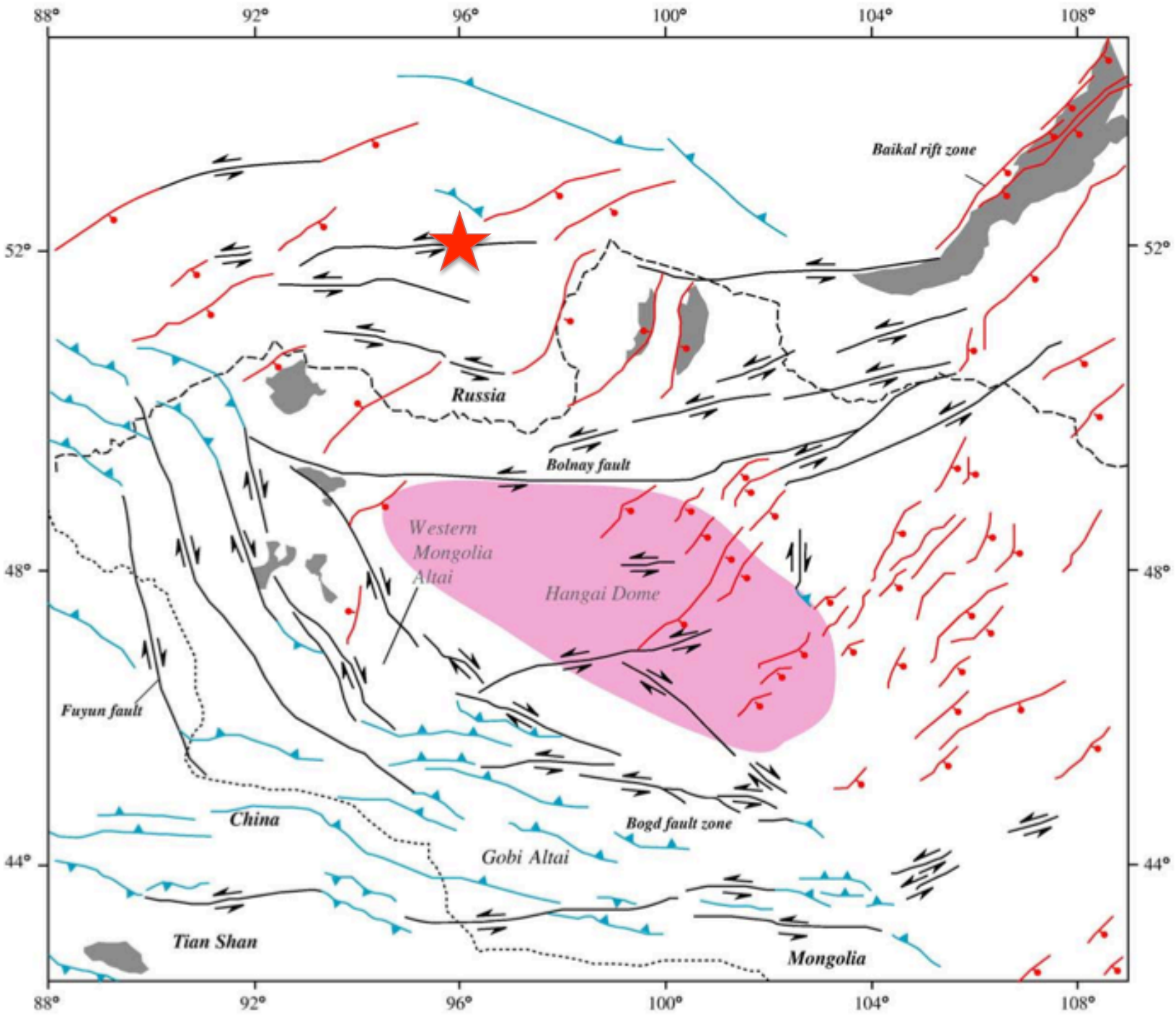

91°
92°
93°
94°
95°
96°
97°
98°
99°
100°
101°
55°
54°
53°
52°
51°
50°
49°
Abakan
HARV
Mw=6.7
USGS
Mw=6.6
Kyzyl
EMSC manual location
CPP
Mw=6.6
AZUR
Mw=6.7
Ulaangom
GFZ
Mw=6.6
EMSC
0 km
100 km
200 km

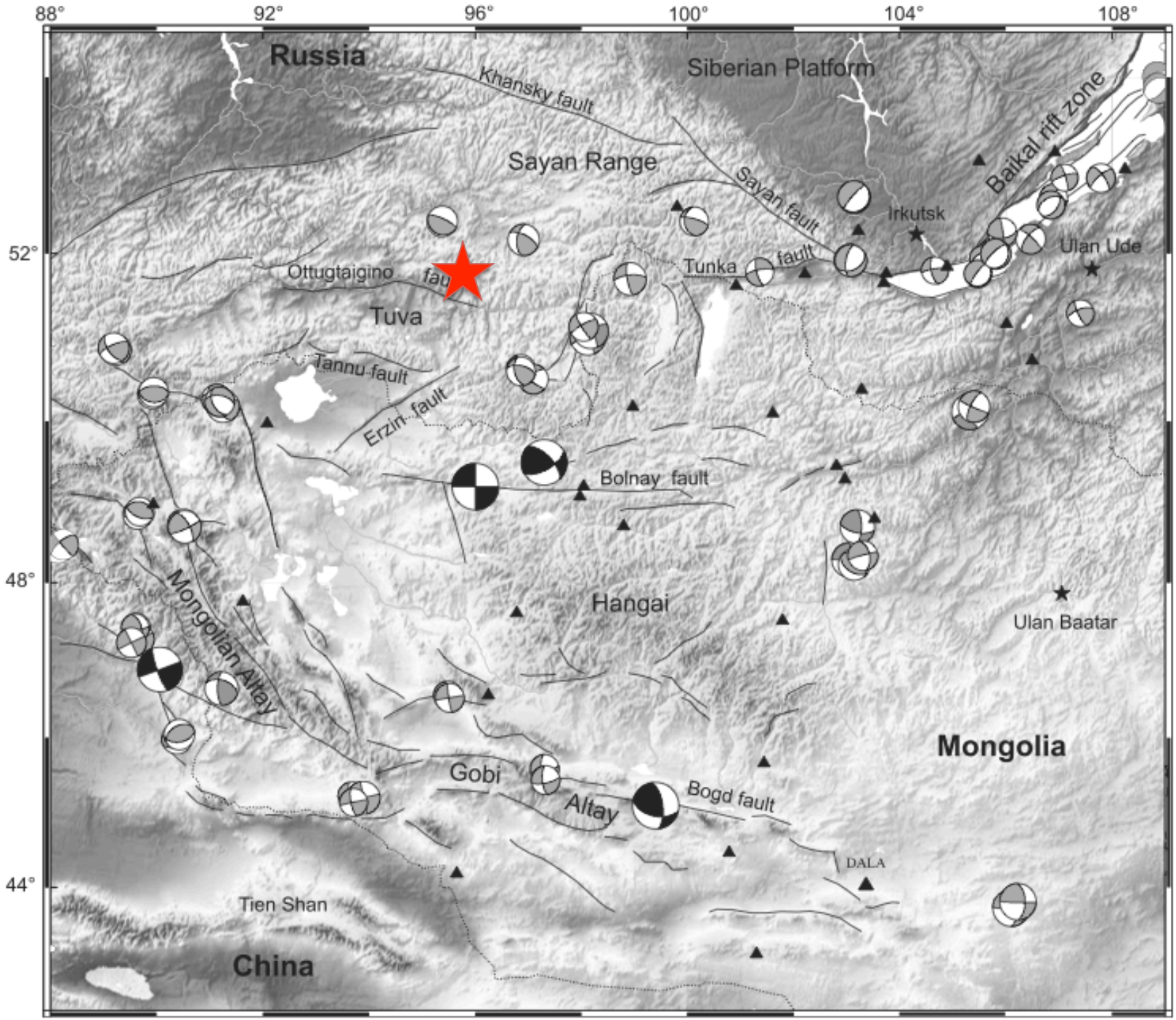

91°
92°
93°
94°
95°
96°
97°
98°
99°
100°
101°
55°
54°
53°
52°
51°
50°
49°
Abakan
HARV
Mw=6.7
USGS
Mw=6.6
Kyzyl
EMSC manual location
CPP
Mw=6.6
AZUR
Mw=6.7
Ulaangom
GFZ
Mw=6.6
EMSC
0 km
100 km
200 km

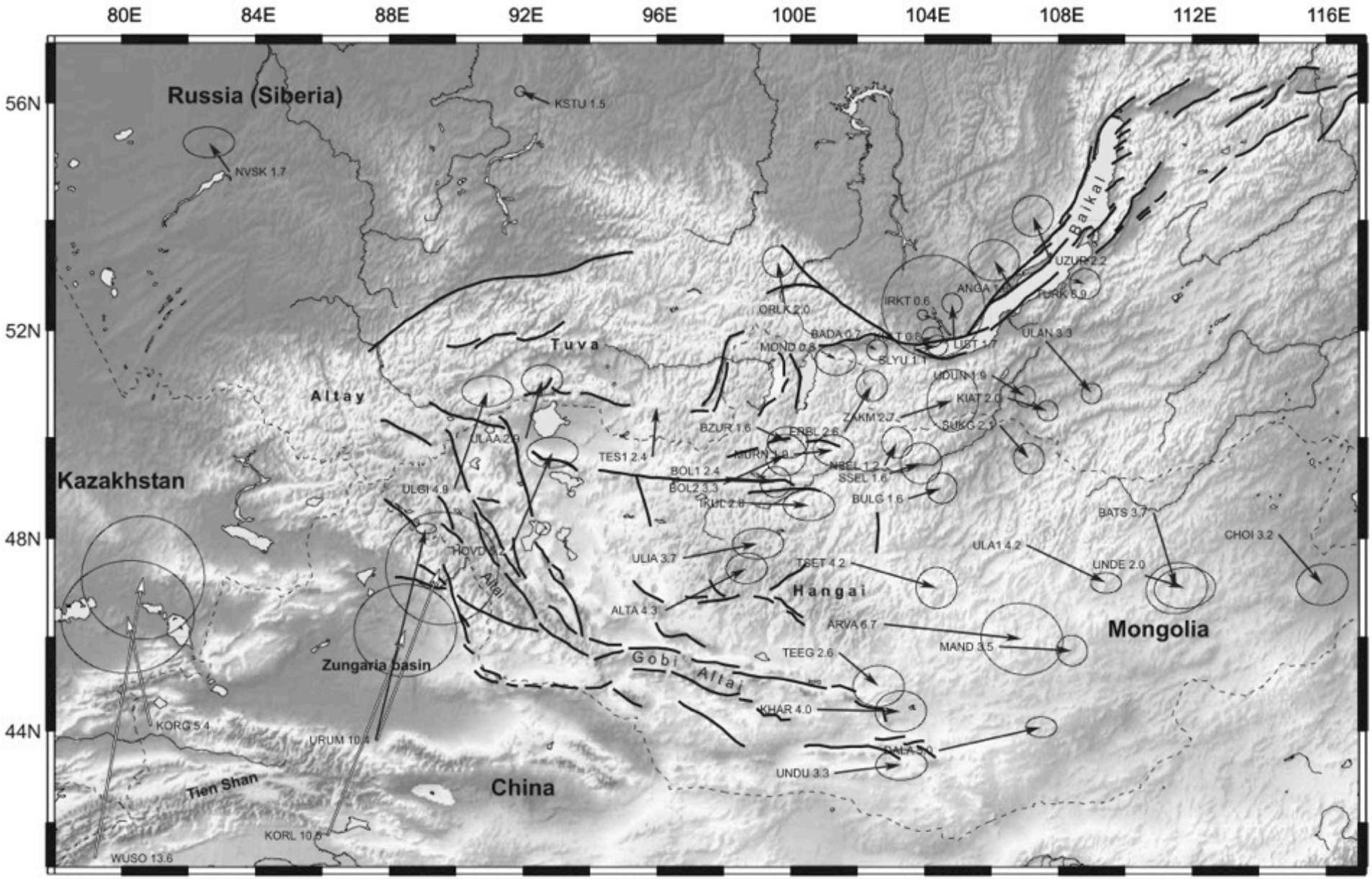

60E
70E
80E
90E
100E
110E
120E
130E
140E
150E
160E
60N
50N
40N
30N
20N
10N
Eurasian Plate
Siberian platform
Stanovoy range
Baikal
Sayan
Tuva
Hovsgol
Bolnay
Mongolian Altay
Hangai
Mongolia
Gobi Altay
Kazakh platform
North China
Okhotsk Sea
Tien Shan
Tarim basin
Altyn Tagh
Pamir
Ordos
Japan Sea
Tibet
Qiling Shan
Pacific plate
Himalayas
South China
4 cm/yr
South China Sea
Phil. Sea plate
Indian plate
Sunda block

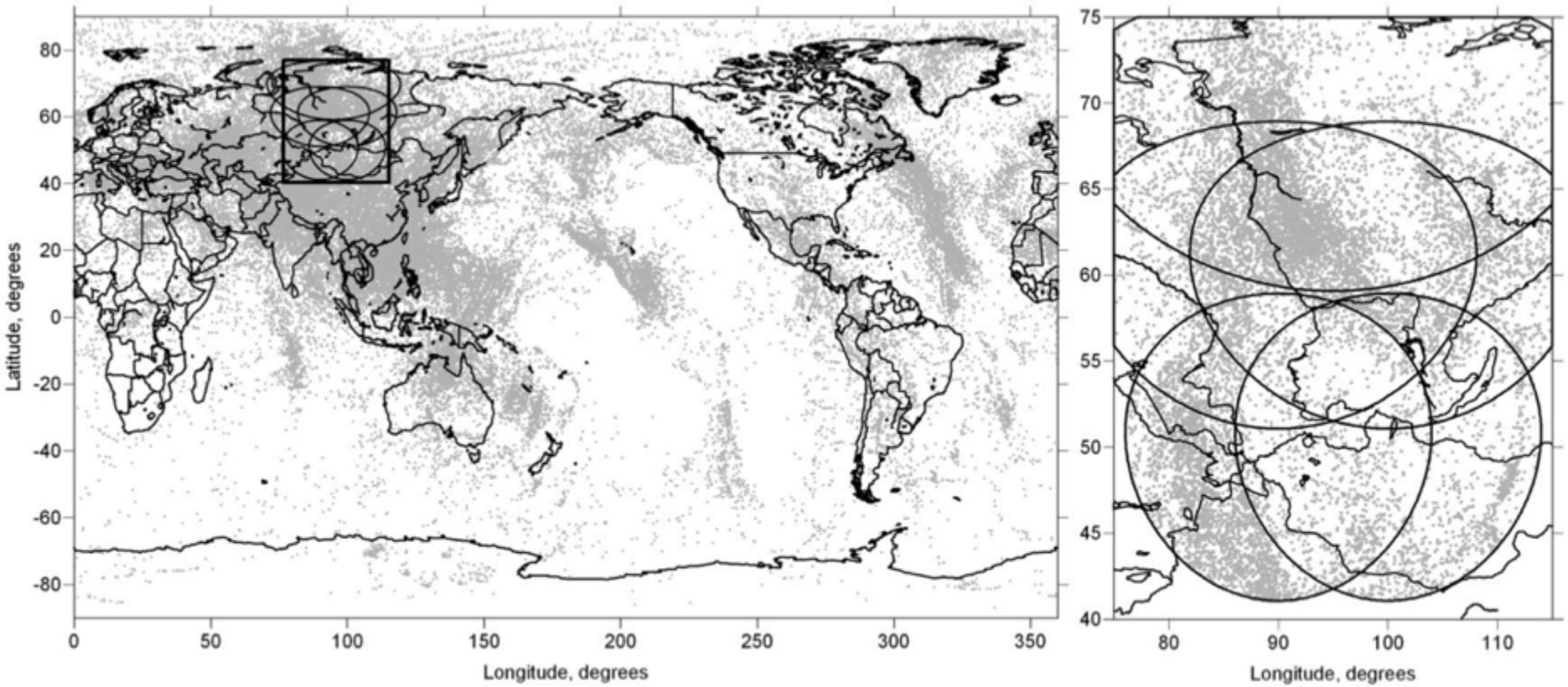


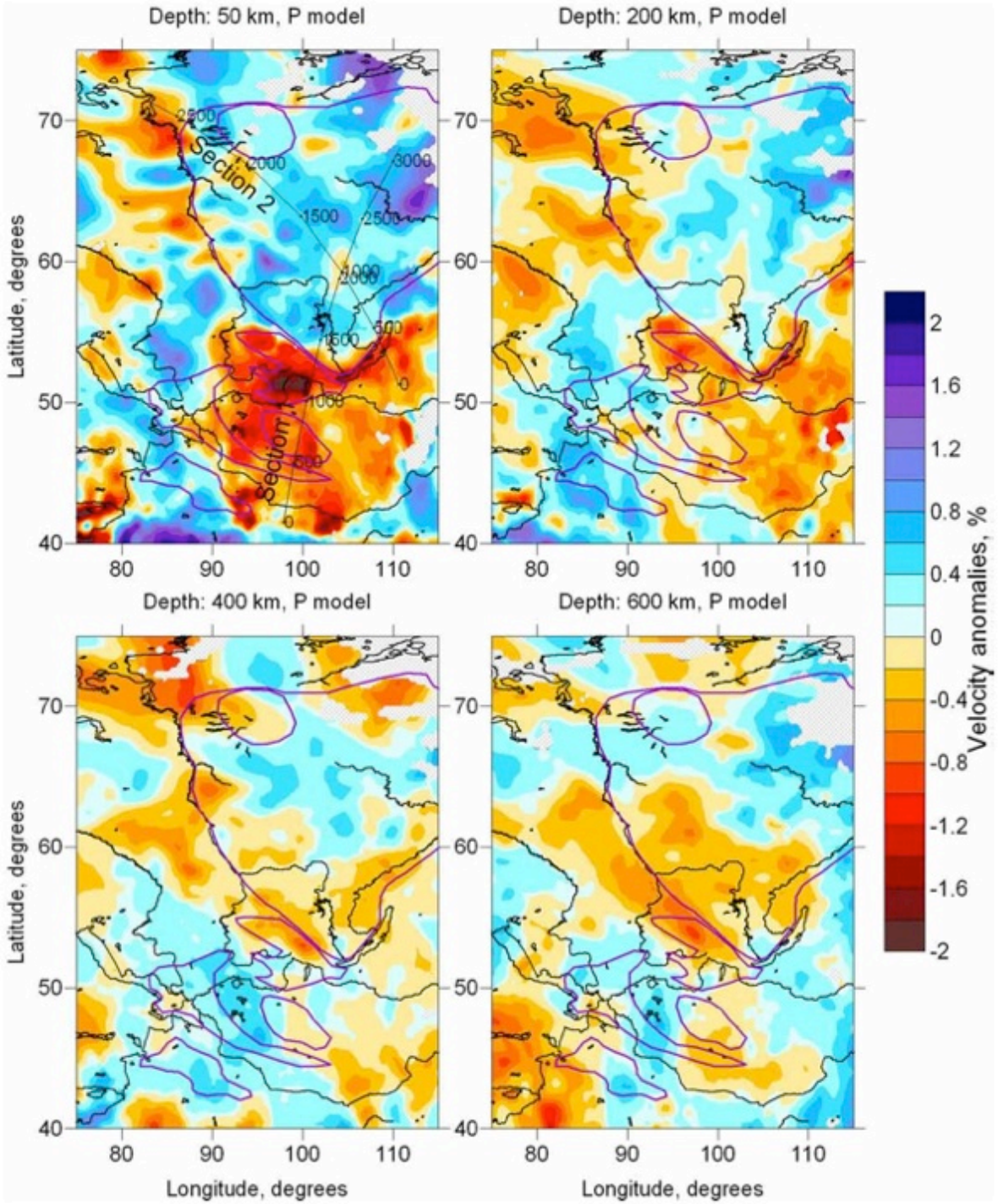
I. Yu. Kulakov, 2008

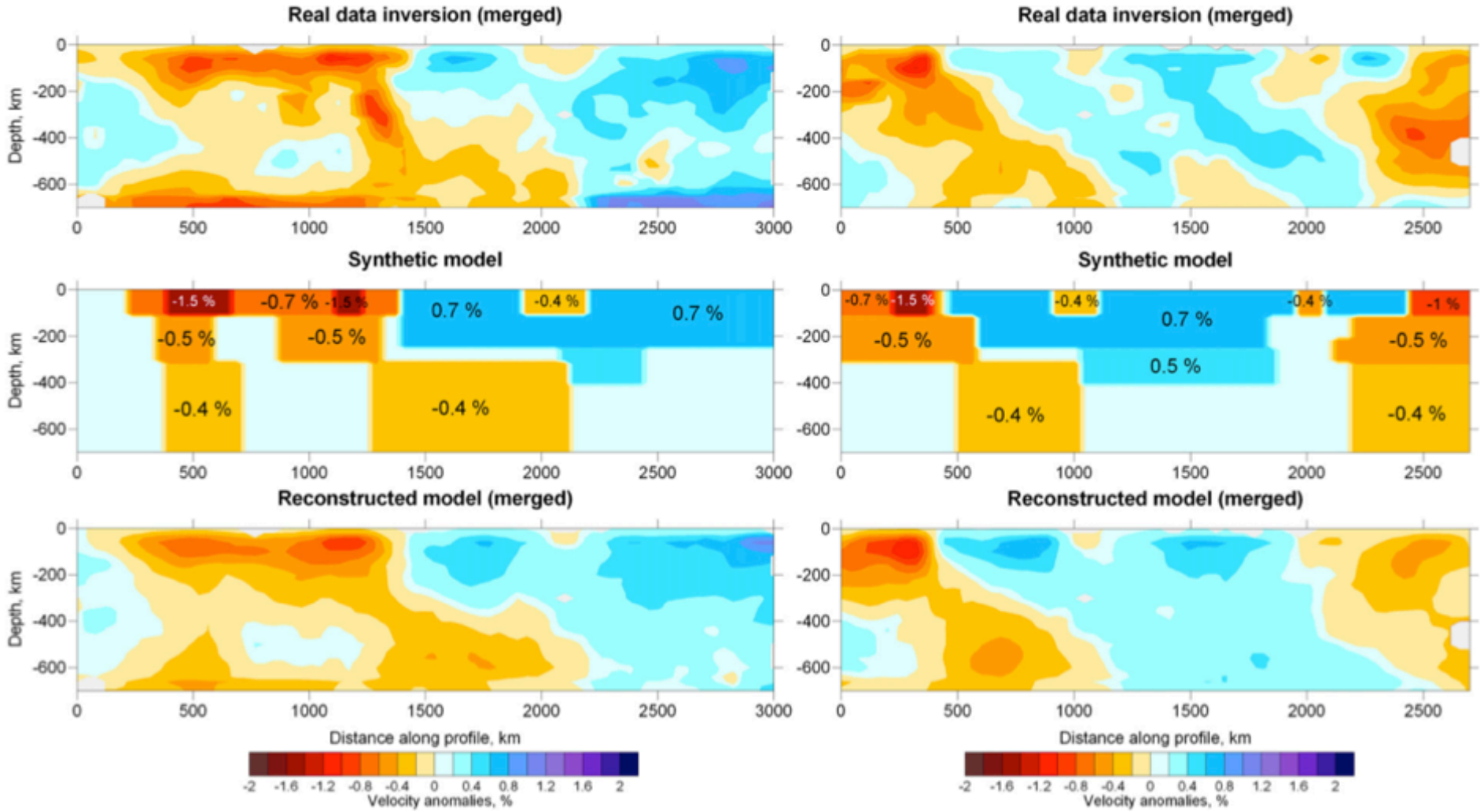

88°
92°
96°
100°
104°
108°
52°
48°
44°
Baikal rift zone
Russia
Bolnay fault
Western
Mongolia
Altai
Hangai Dome
Fuyun fault
China
Bogd fault zone
Gobi Altai
Tian Shan
Mongolia

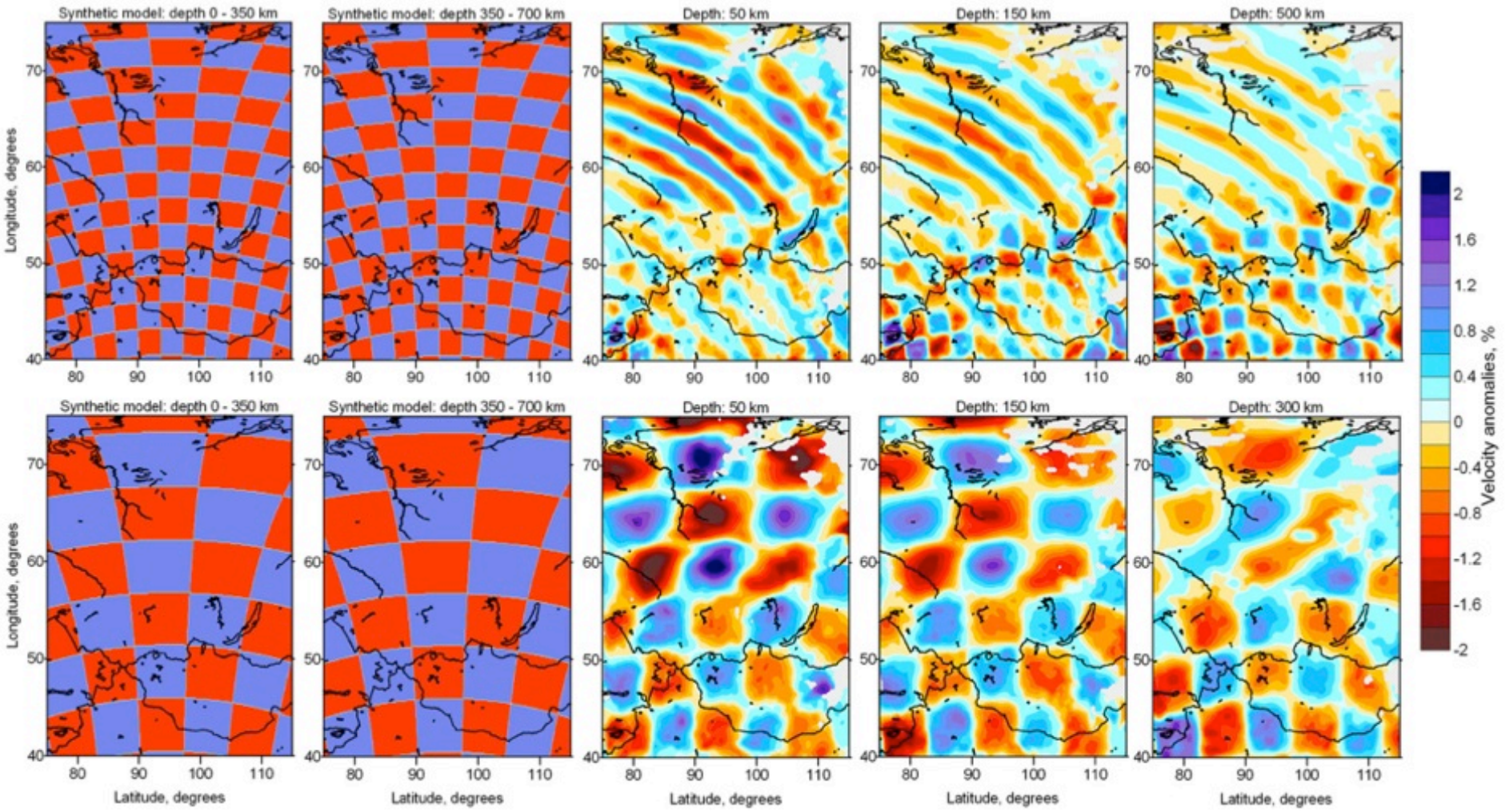

88°
92°
96°
100°
104°
108°
52°
48°
44°
Russia
Siberian Platform
Khansky fault
Sayan Range
Sayan fault
Baikal rift zone
Irkutsk
Ulan Ude
Tunka
fault
Ottugtaigino
fau
Tuva
Tannu fault
Erzin fault
Bolnay fault
Hangai
Ulan Baatar
Mongolian Altay
Mongolia
Gobi
Altay
Bogd fault
DALA
Tien Shan
China

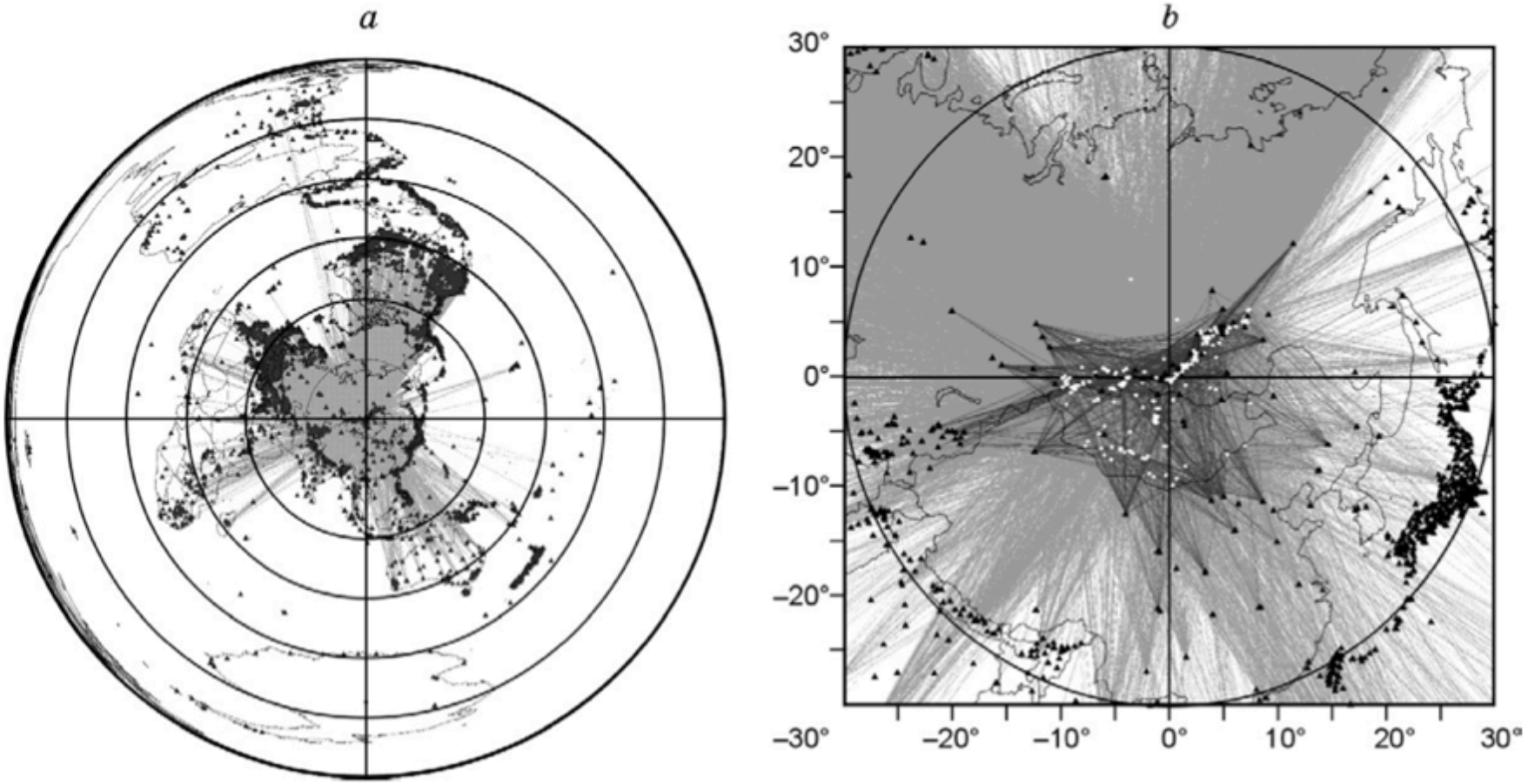

80E
84E
88E
92E
96E
100E
104E
108E
112E
116E
56N
52N
48N
44N
Russia (Siberia)
KSTU 1.5
NVSK 1.7
Baikal
UZUR 2.2
ANGA
TURK 6.9
IRKT 0.6
ORLK 2.0
BADA 0.7
MOND 0.8
LIST 1.7
SLYU 1.1
ULAN 3.3
UDUN 1.9
KIAT 2.0
SUKG 2.1
ZAKM 2.7
Tuva
Altay
BZUR 1.6
ERBL 2.6
MURN 1.9
NSEL 1.2
SSEL 1.6
BULG 1.6
TES1 2.4
BOL1 2.4
BOL2 3.3
IKUL 2.8
ULAA 2.9
Kazakhstan
ULGI 4.9
HOVD
Altai
ULIA 3.7
ALTA 4.3
TSET 4.2
Hangai
ULA1 4.2
UNDE 2.0
BATS 3.7
CHOI 3.2
Mongolia
ARVA 6.7
MAND 3.5
TEEG 2.6
Gobi
Altai
Zungaria basin
KHAR 4.0
KORG 5.4
URUM 10.4
UNDU 3.3
Tien Shan
China
KORL 10.6
WUSO 13.6

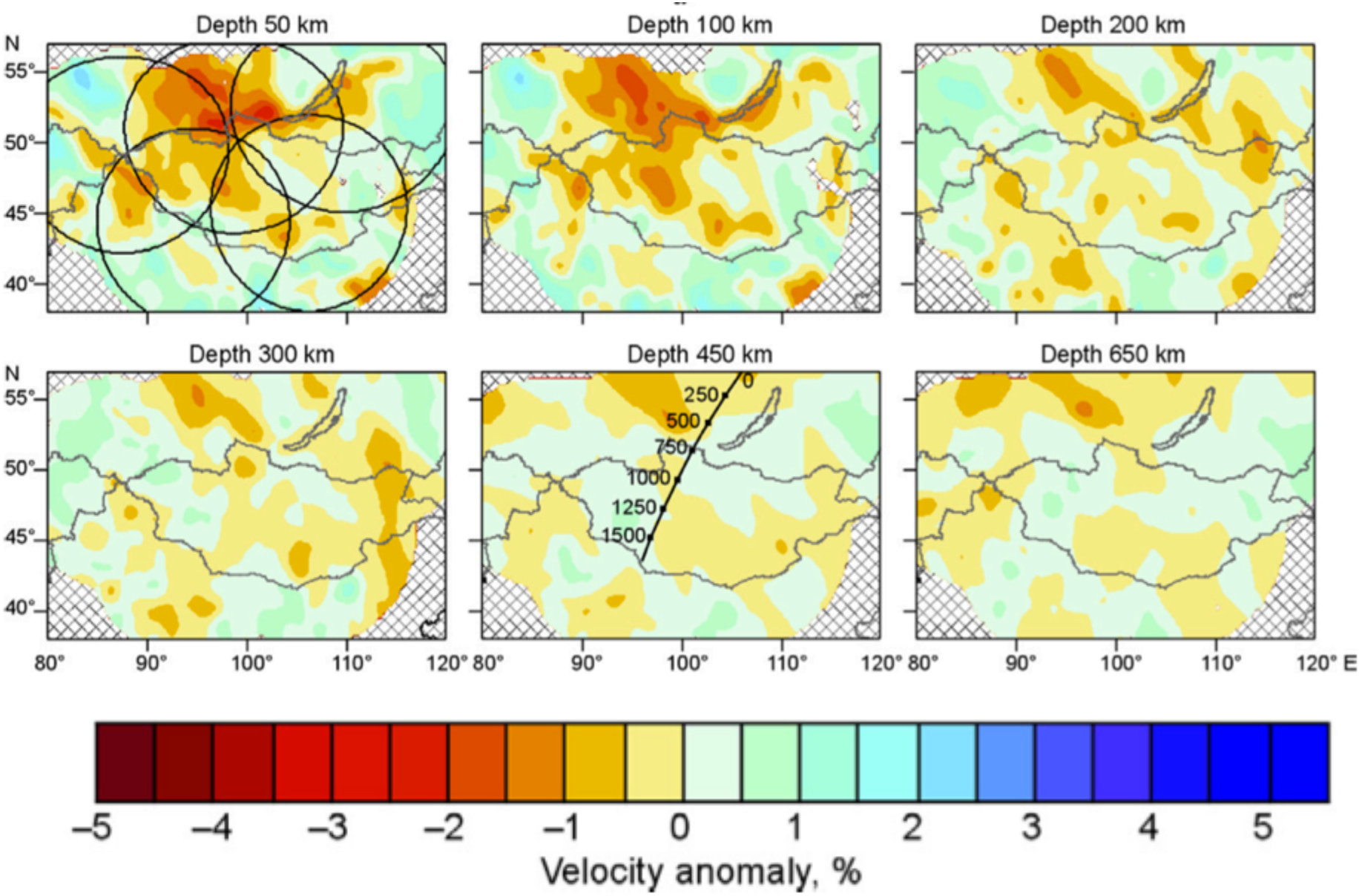

Latitude, degrees
80
60
40
20
0
-20
-40
-60
-80
0
50
100
150
200
250
300
350
Longitude, degrees
75
70
65
60
55
50
45
40
80
90
100
110
Longitude, degrees

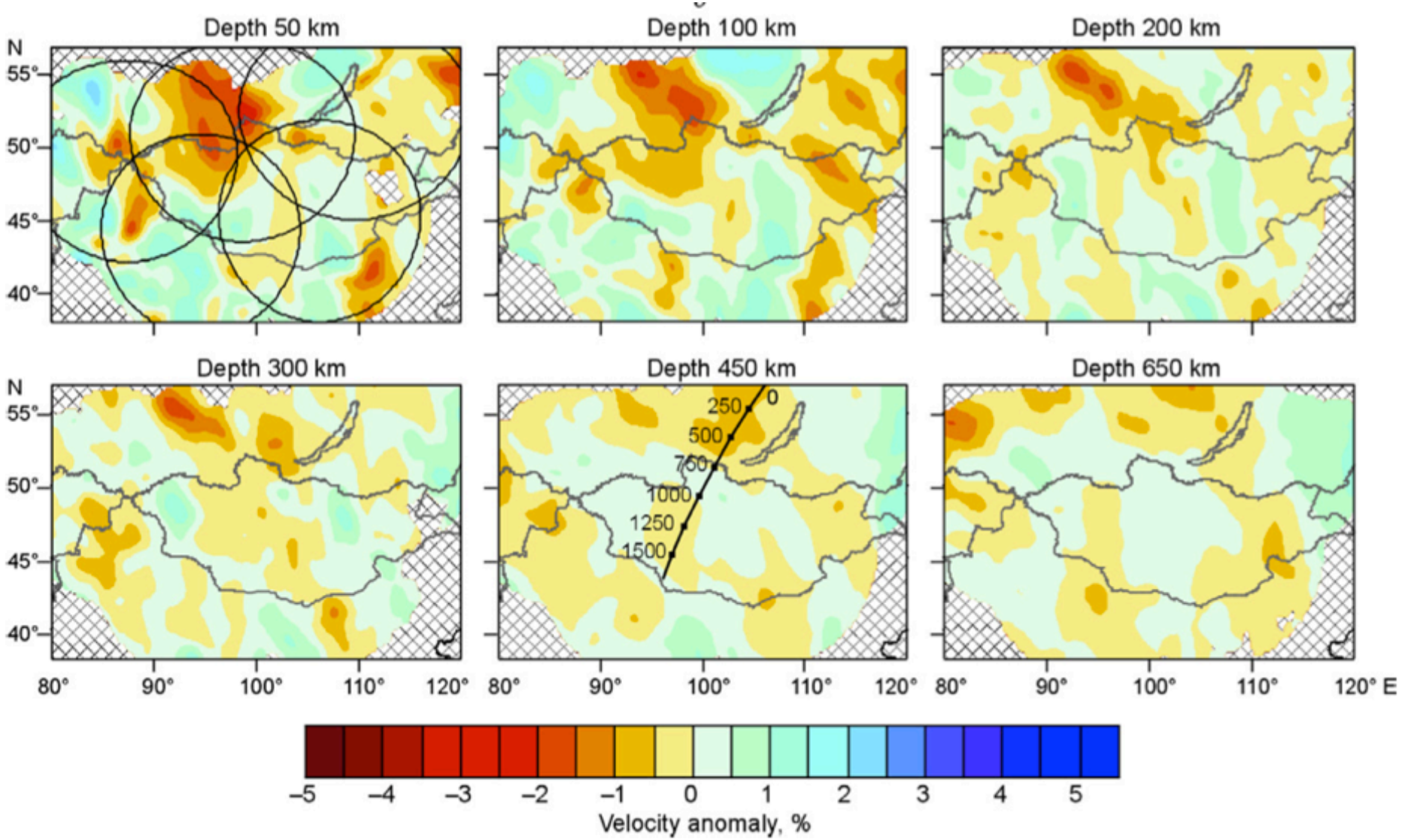

Depth: 50 km, P model
Depth: 200 km, P model
Depth: 400 km, P model
Depth: 600 km, P model
Section 1
Section 2
Latitude, degrees
Longitude, degrees
Velocity anomalies, %
2
1.6
1.2
0.8
0.4
0
-0.4
-0.8
-1.2
-1.6
-2
40
50
60
70
80
90
100
110

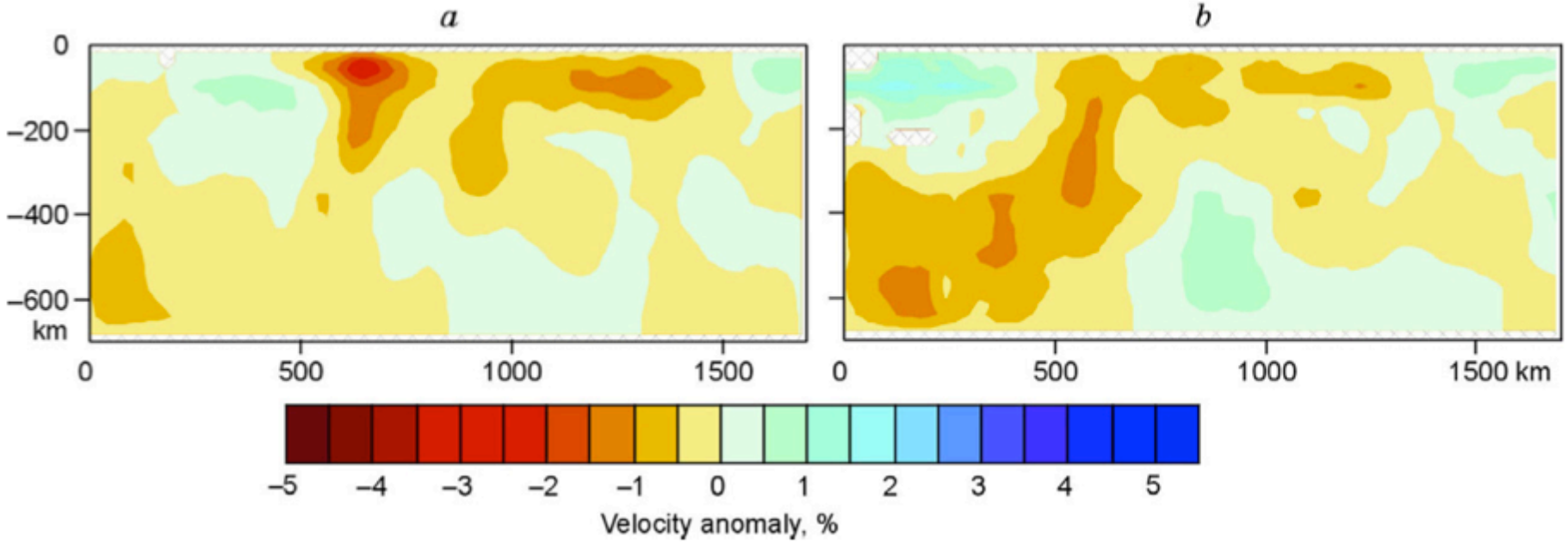

Real data inversion (merged)
Real data inversion (merged)
Synthetic model
Synthetic model
Reconstructed model (merged)
Reconstructed model (merged)
Depth, km
0
-200
-400
-600
0
500
1000
1500
2000
2500
3000
-1.5 %
-0.7 %
-1.5 %
0.7 %
-0.4 %
0.7 %
-0.5 %
-0.5 %
-0.4 %
-0.4 %
-0.7 %
-1.5 %
-0.4 %
-0.4 %
0.7 %
-1 %
-0.5 %
0.5 %
-0.5 %
-0.4 %
-0.4 %
Distance along profile, km
-2
-1.6
-1.2
-0.8
-0.4
0
0.4
0.8
1.2
1.6
2
Velocity anomalies, %


Synthetic model: depth 0 - 350 km
Synthetic model: depth 350 - 700 km
Depth: 50 km
Depth: 150 km
Depth: 500 km
Synthetic model: depth 0 - 350 km
Synthetic model: depth 350 - 700 km
Depth: 50 km
Depth: 150 km
Depth: 300 km
Longitude, degrees
Latitude, degrees
40
50
60
70
80
90
100
110
Velocity anomalies, %
2
1.6
1.2
0.8
0.4
0
-0.4
-0.8
-1.2
-1.6
-2


a
b
30°
20°
10°
0°
–10°
–20°
–30°
–20°
–10°
0°
10°
20°
30°


Depth 50 km
Depth 100 km
Depth 200 km
Depth 300 km
Depth 450 km
Depth 650 km
N
55°
50°
45°
40°
80°
90°
100°
110°
120° E
0
250
500
750
1000
1250
1500
–5
–4
–3
–2
–1
0
1
2
3
4
5
Velocity anomaly, %


Depth 50 km
Depth 100 km
Depth 200 km
Depth 300 km
Depth 450 km
Depth 650 km
N
55°
50°
45°
40°
0
250
500
750
1000
1250
1500
80°
90°
100°
110°
120°
120° E
–5
–4
–3
–2
–1
0
1
2
3
4
5
Velocity anomaly, %


a
b
0
–200
–400
–600
km
0
500
1000
1500
0
500
1000
1500 km
–5
–4
–3
–2
–1
0
1
2
3
4
5
Velocity anomaly, %

Thank you !