R/V Zephyr
2012 Gulf of California Expedition
Mapping AUV Surveys
Expedition Science Plan

Draft 2.0 (8 March 2012)

Shipboard Personnel

Captain Aaron Gregg
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Engineer Jim Boedecker
Relief Mate Paul Ban
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David Clague (Legs 4-6)

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Planned Expedition Timeline:

Transit: February 23-28, 2012
February 23: Depart Moss Landing, California.
February 28: Arrive La Paz, Mexico.

Port stop La Paz Mexico: February 29 – March 9
Hans Thomas arrives February 28.
Dave Caress arrives March 9.
Doug Conlin arrive March 9.

Leg 1: March 10-14, 2012
March 10: Depart La Paz, Mexico.
Conduct Mapping AUV missions:

- 2012_area_14_m1_v2.rte
- 2012_area_13_m1_v2.rte
- 2012_area_9_m1_v2.rte
- 2012_area_5_m1_v2.rte

March 14: Arrive San Carlos, Mexico.

Port stop San Carlos Mexico: March 15-16
Dave Caress departs March 15.

Leg 2: March 17-21, 2012
March 17: Depart San Carlos, Mexico.
Conduct Mapping AUV missions:

- 2012_area_5_m1_v2.rte
- 2012_area_7_m1_v2.rte
- 2012_area_2_m1_v2.rte
    - Contingency missions if currents at too high at site 2:
        - 2012_area_3_m2_v2.rte
        - 2012_area_3_m3_v2.rte
        - 2012_area_4_m1_v2.rte
- 2012_area_5_m2_v2.rte

March 21: Arrive San Carlos, Mexico.

Port stop San Carlos Mexico: March 22-23
Dave Caress arrives March 23.

Leg 3: March 24-28, 2012
March 24: Depart San Carlos, Mexico.
Conduct Mapping AUV missions:

- 2012_area_6_m1_v2.rte
- 2012_area_8_m1_v2.rte
- 2012_area_10_m1_v2.rte
- 2012_area_12_m1_v3.rte

March 28: Arrive San Jose del Cabo, Mexico.

Port stop San Jose del Cabo, Mexico: March 29 - April 2

Dave Caress departs March 29.
Doug Conlin departs
Duane Thompson arrives

Leg 4: April 3-7, 2012
April 3: Depart San Jose del Cabo, Mexico.
Conduct Mapping AUV missions:

- Alarcon_1v1.rte
- Alarcon_2v1.rte
- Alarcon_3v1.rte
- Alarcon_4v1.rte

April 7: Arrive San Jose del Cabo, Mexico.

Port stop San Jose del Cabo, Mexico: April 8-9

Leg 5: April 10-14, 2012
April 10: Depart San Jose del Cabo, Mexico.
Conduct Mapping AUV missions:

- Alarcon_5v1.rte
- Alarcon_6v1.rte
- Alarcon_7v1.rte
- Alarcon_8v1.rte

April 14: Arrive San Jose del Cabo, Mexico.

Port stop San Jose del Cabo, Mexico: April 15-16

Dave Caress arrives April 16

Leg 6: April 17-21, 2012
April 17: Depart San Jose del Cabo, Mexico.
Conduct Mapping AUV missions:

- Alarcon_9v1.rte
- Alarcon_10v1.rte
- Alarcon_11v1.rte
- Alarcon_12v1.rte

April 21: Arrive San Jose del Cabo, Mexico.

Port stop San Jose del Cabo, Mexico: April 22-23

Dave Caress departs April 24
Hans Thomas and Duane Thompson depart after shipping INS.

Transit: April 24-28, 2012
April 24: San Jose del Cabo, Mexico.
April 28: Arrive Moss Landing, California.

Leg	Site Name	Survey Name	Decimal Longitude	Decimal Latitude	Depth (m)
1	Paull Site 14	2012_area_14_m1_v2.rte	-109.829936	25.280658	-2553
1	Paull Site 13	2012_area_13_m1_v2.rte	-109.903043	25.690951	-1253
1	Paull Site 9	2012_area_9_m1_v2.rte	-110.713445	26.403417	-2774
1	Paull Site 5 Mission 1	2012_area_5_m1_v2.rte	-111.444569	27.622225	-1257
2	Paull Site 5 Mission 1 (complete)	2012_area_5_m1_v2.rte	-111.444569	27.622225	-1257
2	Paull Site 7	2012_area_7_m1_v2.rte	-111.177116	26.769719	-1739
2	Paull Site 2	2012_area_2_m1_v2.rte	-112.452866	28.291782	-1057
2	Paull Site 5 Mission 2	2012_area_5_m2_v2.rte	-111.486062	27.647019	-1303
3	Paull Site 6	2012_area_6_m1_v2.rte	-111.302672	26.855318	-1743
3	Paull Site 8	2012_area_8_m1_v2.rte	-110.999747	26.632107	-1573
3	Paull Site 10	2012_area_10_m1_v2.rte	-110.613806	26.175722	-2404
3	Paull Site 12	2012_area_12_m1_v3.rte	-110.148225	25.807823	-1830
4	Alarcon Site 1	Alarcon_1v1.rte	-108.555234	23.367632	-2264
4	Alarcon Site 2	Alarcon_2v1.rte	-108.588992	23.321261	-2389
4	Alarcon Site 3	Alarcon_3v1.rte	-108.628199	23.280418	-2374
4	Alarcon Site 4	Alarcon_4v1.rte	-108.508990	23.406288	-2380
5	Alarcon Site 5	Alarcon_5v1.rte	-108.475629	23.453762	-2388
5	Alarcon Site 6	Alarcon_6v1.rte	-108.441443	23.498811	-2449
5	Alarcon Site 7	Alarcon_7v1.rte	-108.425133	23.555440	-2427
5	Alarcon Site 8	Alarcon_8v1.rte	-108.393034	23.601434	-2414
6	Alarcon Site 9	Alarcon_9v1.rte	-108.614265	23.272948	-2361
6	Alarcon Site 10	Alarcon_10v1.rte	-108.549303	23.332851	-2348
6	Alarcon Site 11	Alarcon_11v1.rte	-108.810378	23.607926	-1232
6	Alarcon Site 12	Alarcon_12v1.rte	-108.615415	23.578722	-2403
	Paull Site 1	2012_area_1_m1_v2.rte	-112.929299	28.629410	-1317
	Paull Site 3 Mission 2	2012_area_3_m2_v2.rte	-112.233188	28.080332	-372
	Paull Site 3 Mission 3	2012_area_3_m3_v2.rte	-112.211904	28.078154	-646
	Paull Site 4	2012_area_4_m1_v2.rte	-111.945434	27.902028	-837
	Paull Site 11	2012_area_11_m1_v2.rte	-110.278183	25.917675	-1785

Table 1. Mapping AUV Survey launch points in decimal degrees.

Leg	Survey Name	Longitude	Latitude	Water Depth (m)
1	2012_area_14_m1_v2.rte	109° 49.796' W	25° 16.839' N	-2553
1	2012_area_13_m1_v2.rte	109° 54.183' W	25° 41.457' N	-1253
1	2012_area_9_m1_v2.rte	110° 42.807' W	26° 24.205' N	-2774
1	2012_area_5_m1_v2.rte	111° 29.674' W	27° 37.334' N	-1257
2	2012_area_5_m1_v2.rte	111° 29.674' W	27° 37.334' N	-1257
2	2012_area_7_m1_v2.rte	111° 10.627' W	26° 46.183' N	-1739
2	2012_area_2_m1_v2.rte	112° 27.172' W	28° 17.507' N	-1057
2	2012_area_5_m2_v2.rte	111° 29.164' W	27° 38.821' N	-1303
3	2012_area_6_m1_v2.rte	111° 18.160' W	26° 51.319' N	-1743
3	2012_area_8_m1_v2.rte	110° 59.985' W	26° 37.926' N	-1573
3	2012_area_10_m1_v2.rte	110° 36.828' W	26° 10.543' N	-2404
3	2012_area_12_m1_v2.rte	110° 8.893' W	25° 48.469' N	-1830
4	Alarcon_1v1.rte	108° 33.314' W	23° 22.058' N	-2264
4	Alarcon_2v1.rte	108° 35.340' W	23° 19.276' N	-2389
4	Alarcon_3v1.rte	108° 37.692' W	23° 16.825' N	-2374
4	Alarcon_4v1.rte	108° 30.539' W	23° 24.377' N	-2379
5	Alarcon_5v1.rte	108° 28.538' W	23° 27.226' N	-2388
5	Alarcon_6v1.rte	108° 26.487' W	23° 29.929' N	-2449
5	Alarcon_7v1.rte	108° 25.508' W	23° 33.326' N	-2427
5	Alarcon_8v1.rte	108° 23.582' W	23° 36.086' N	-2413
6	Alarcon_9v1.rte	108° 36.856' W	23° 16.377' N	-2360
6	Alarcon_10v1.rte	108° 32.958' W	23° 19.971' N	-2348
6	Alarcon_11v1.rte	108° 48.623' W	23° 36.476' N	-1232
6	Alarcon_12v1.rte	108° 36.925' W	23° 34.723' N	-2402
	2012_area_1_m1_v2.rte	112° 55.758' W	28° 37.765' N	-1317
	2012_area_3_m2_v2.rte	112° 13.991' W	28° 4.820' N	-373
	2012_area_3_m3_v2.rte	112° 12.714' W	28° 4.689' N	-646
	2012_area_4_m1_v2.rte	111° 56.726' W	27° 54.122' N	-812
	2012_area_11_m1_v2.rte	110° 16.691' W	25° 55.060' N	-1782

Table 2. Mapping AUV Survey launch points in degrees and minutes.

Some notes on mission priorities for the Charlie Paull sites of legs 1-3

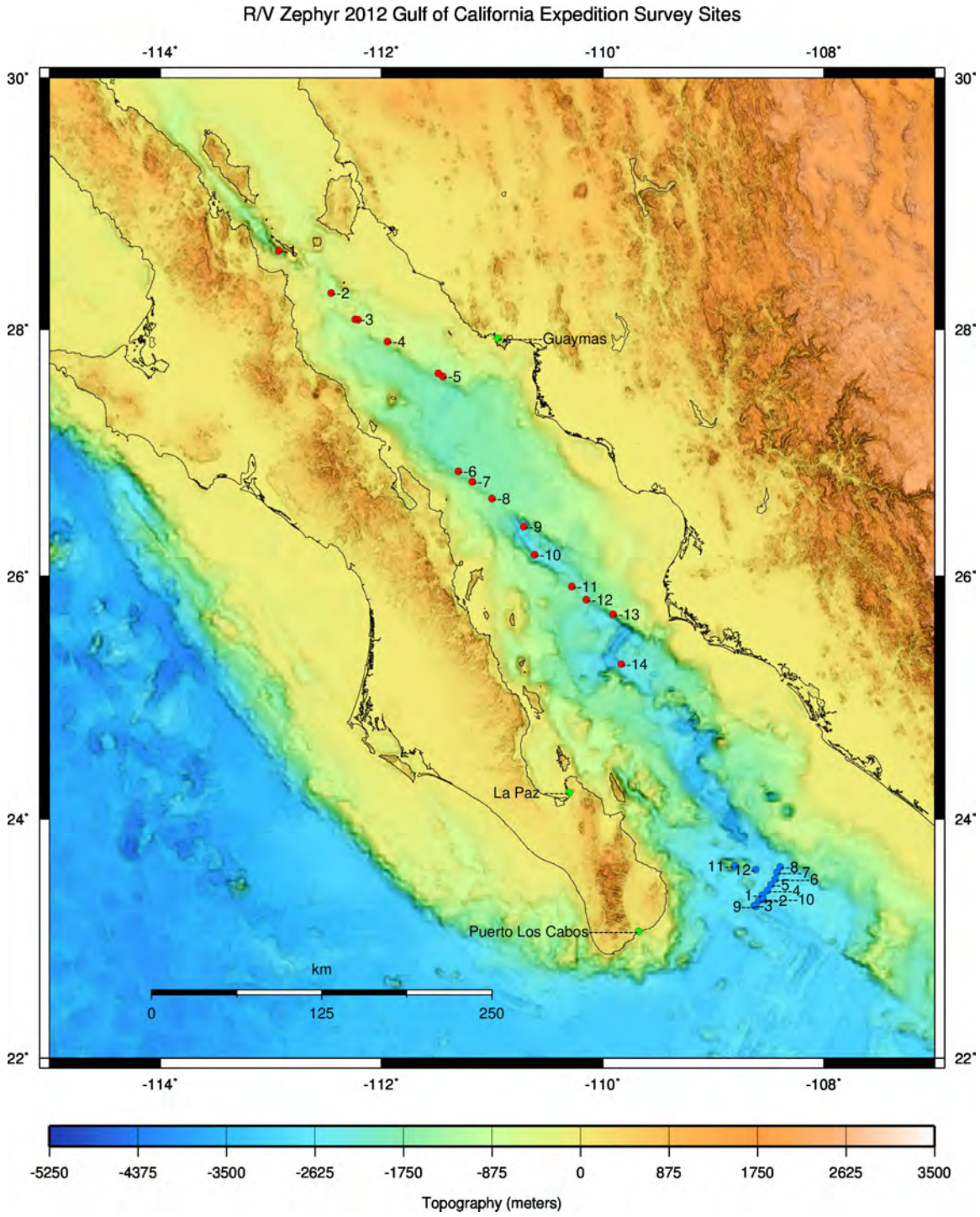
The surveys at sites 13 and 14 are of interest to Peter Brewer, and the bathymetry should be communicated to him as well as to Charlie Paull.

At the end of leg 1, we should start the survey at site 5 (mission 1) even if we only have time for a partial survey. In that case, finishing this survey is the first mission of leg 2.

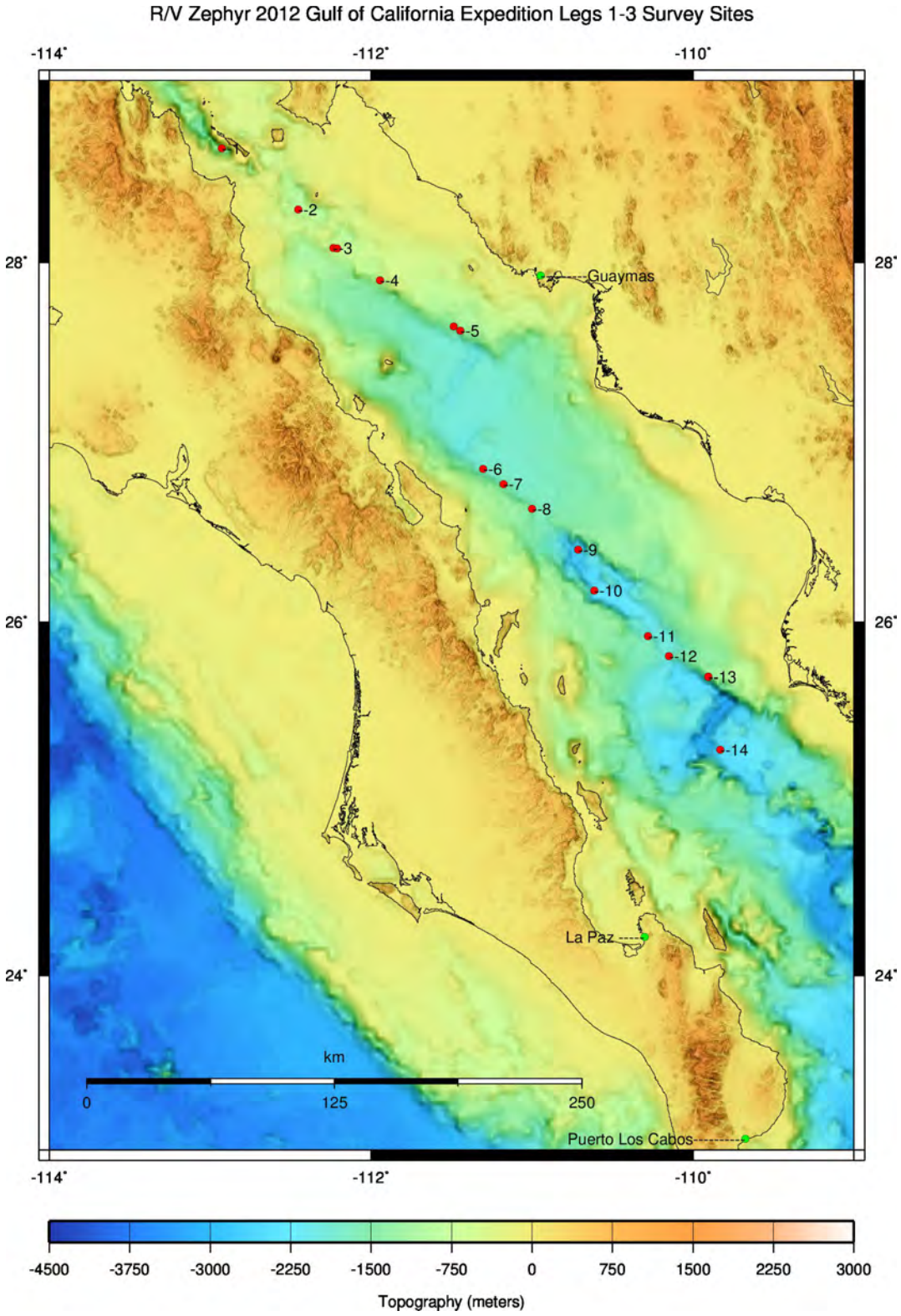
During leg 2, site Paull-2 potentially has currents too strong for the AUV. If we judge the currents to be too high to launch, we should do the northernmost site of 3 and 4 that is practical. We have replaced site 1 with site 2 in this expedition plan due to concern regarding tidal currents at that northernmost site.

Mission priorities for the David Clague sites of legs 4-6

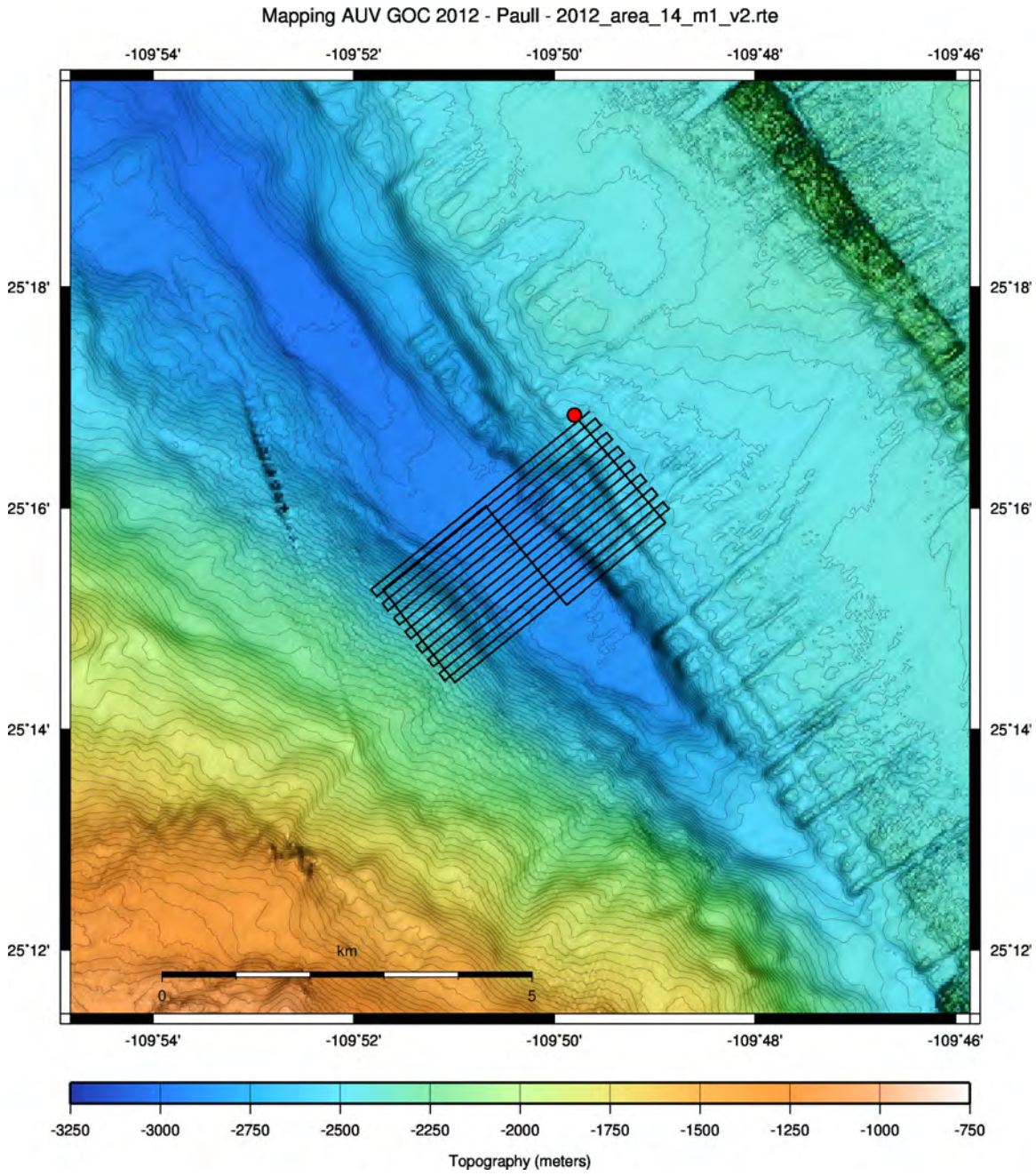
The surveys are prioritized in the order of the numbering. We will start with site 1 and keep going until we run out of time (or are done).



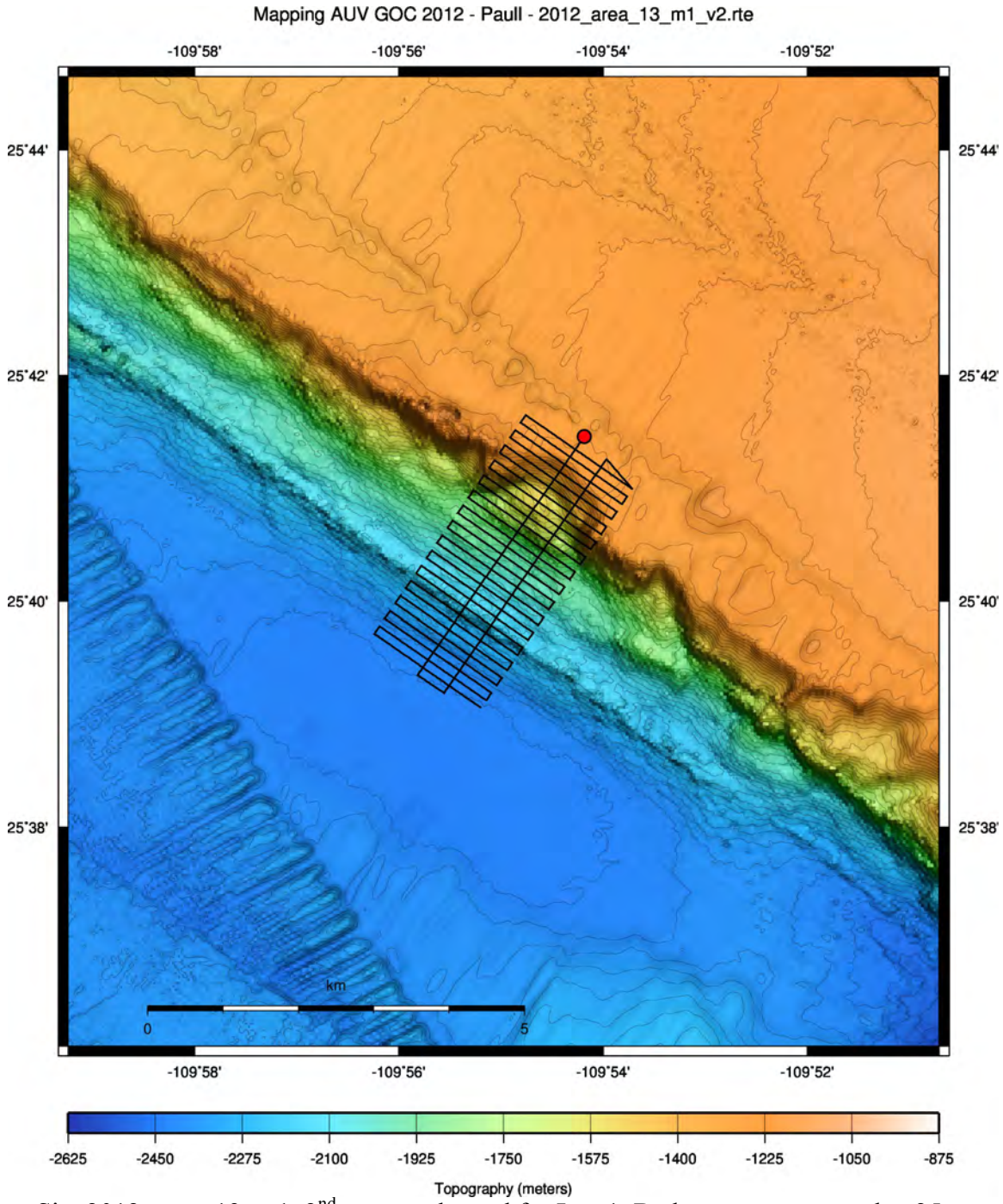
Locations of the complete set of AUV survey missions that have been planned for the GOC Expedition. Leg 1-3 sites are shown in red; leg 4-6 sites are shown in blue. This map shows all 28 missions that have been planned, but no more than 24 can actually be executed during the six 5-day legs.



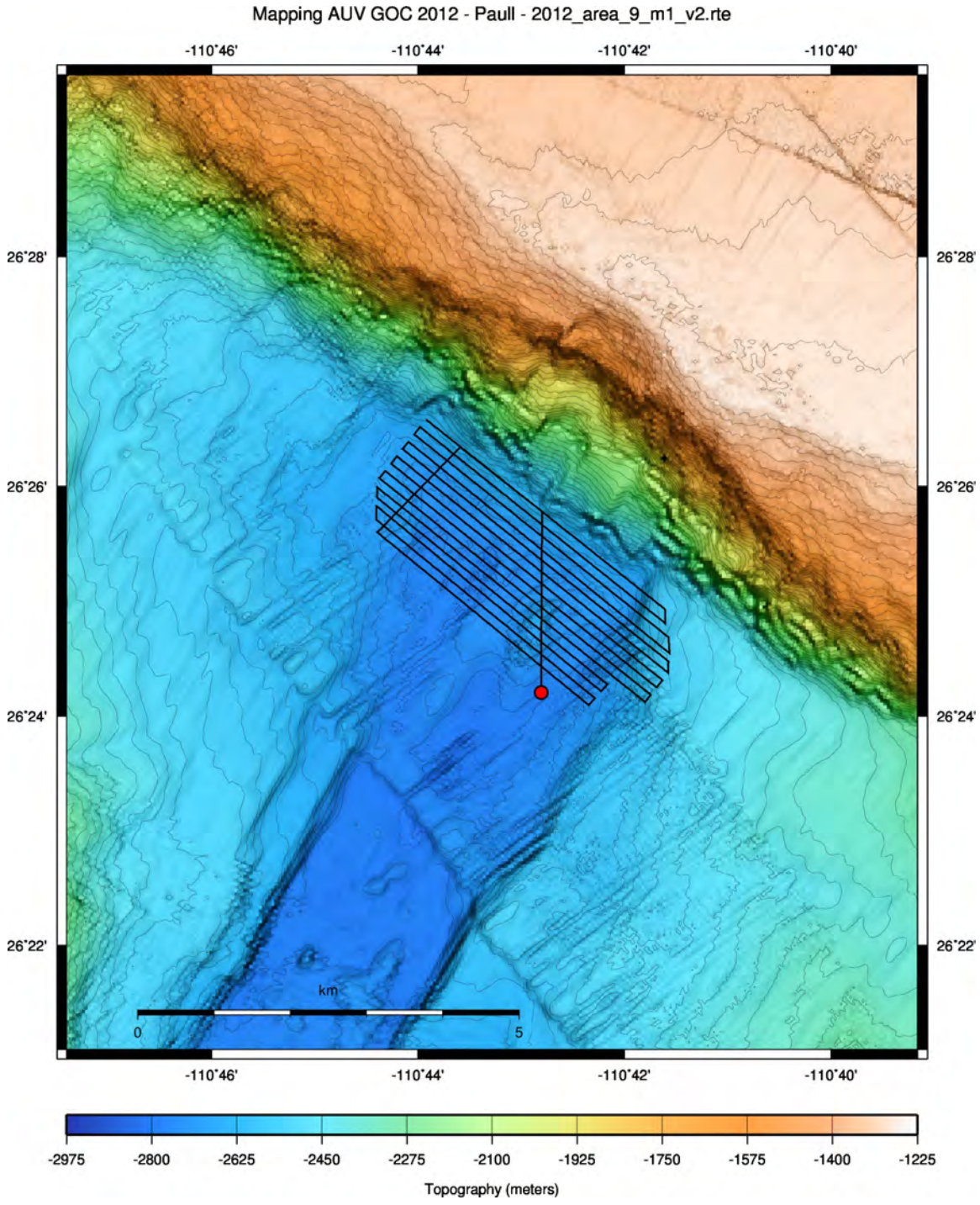
Locations of the AUV survey missions that have been planned for legs 1-3 of the GOC Expedition. Leg 1 will include 14, 13, 9, and 5m1. Leg 2 will include 5m1 (if needed), 7, 2, and 5m2. Leg 3 will include 6, 8, 10, and 12. Missions 1, 3m1, 3m2, 4, and 11 are contingency missions that are unlikely to be run.



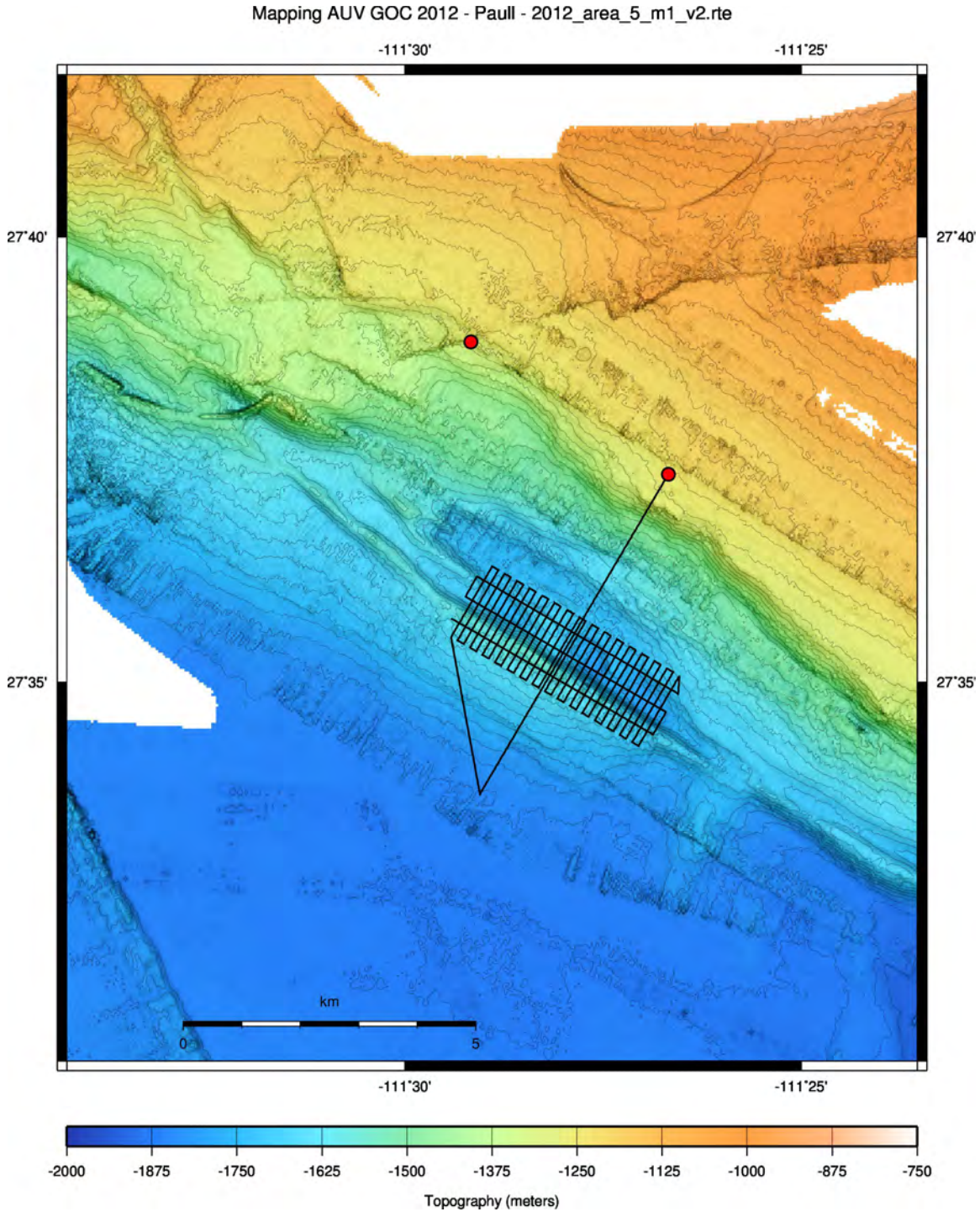
Site 2012_area_14_m1, 1st survey planned for Leg 1. Bathymetry contoured at 25 m intervals.



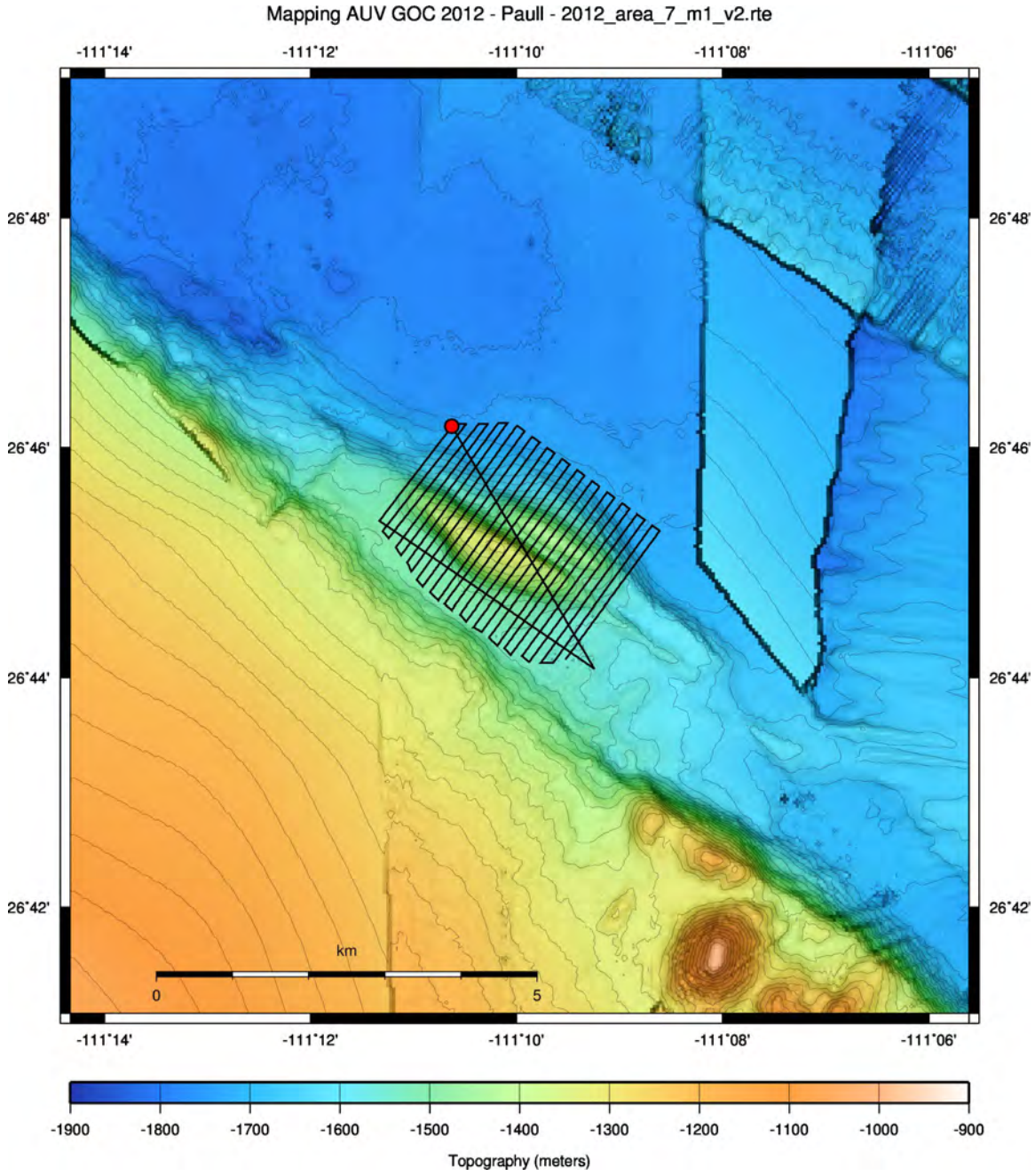
Site 2012_area_13_m1, 2nd survey planned for Leg 1. Bathymetry contoured at 25 m intervals.



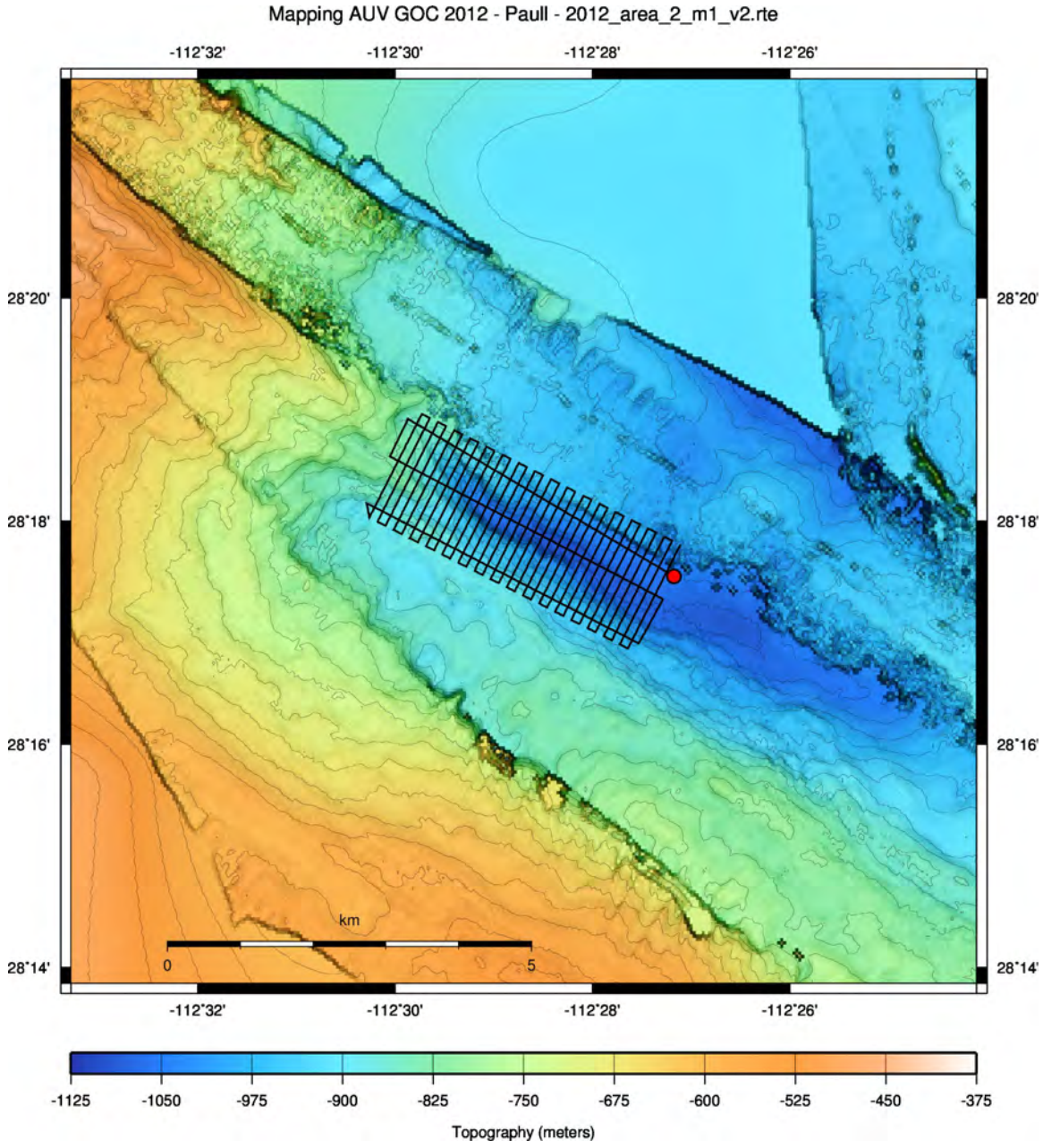
Site 2012_area_9_m1, 3rd survey planned for Leg 1. Bathymetry contoured at 25 m intervals.



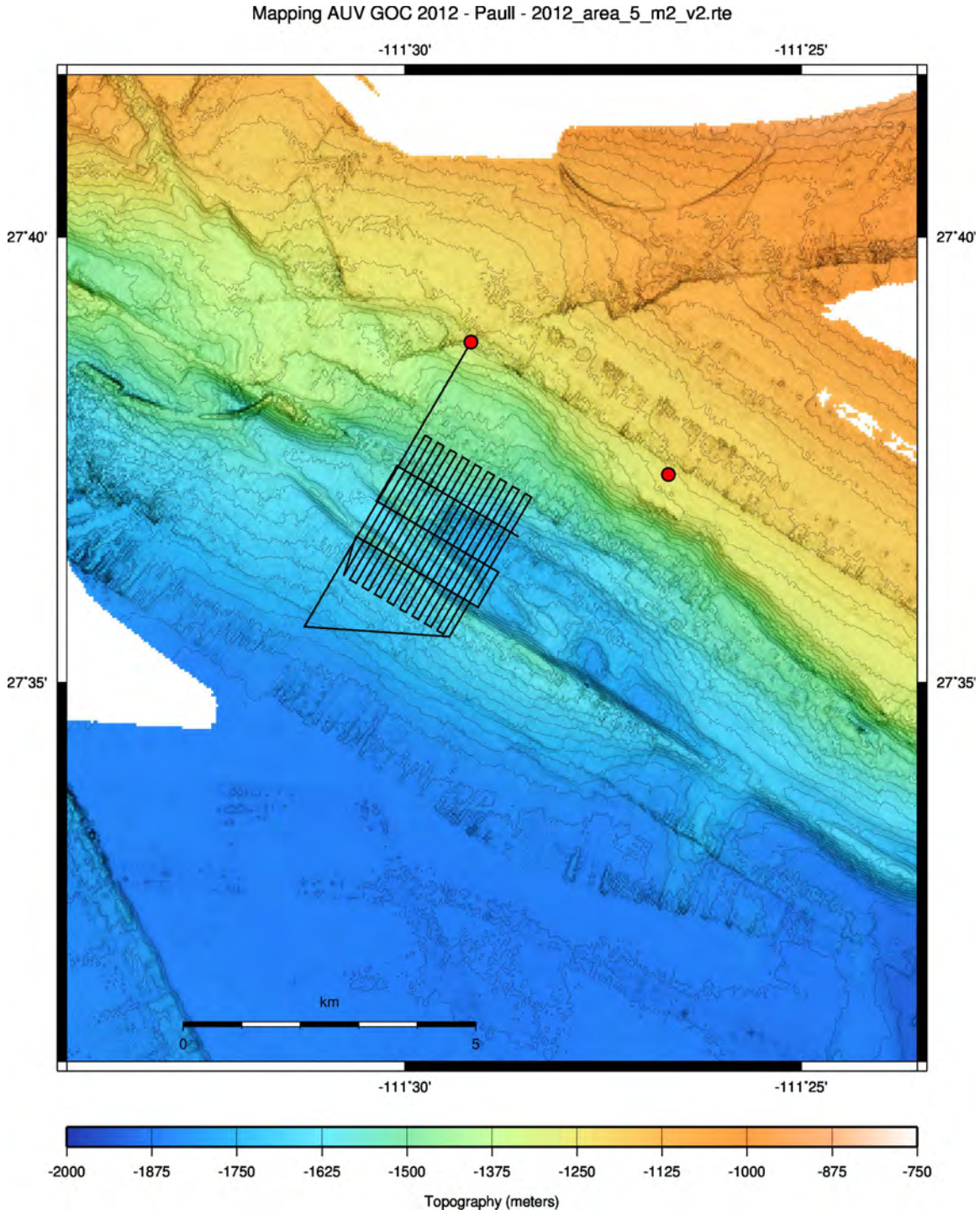
Site 2012_area_5_m1, 4th survey planned for Leg 1.
This survey will likely need to be completed at the start of leg 2. Bathymetry contoured at 25 m intervals.



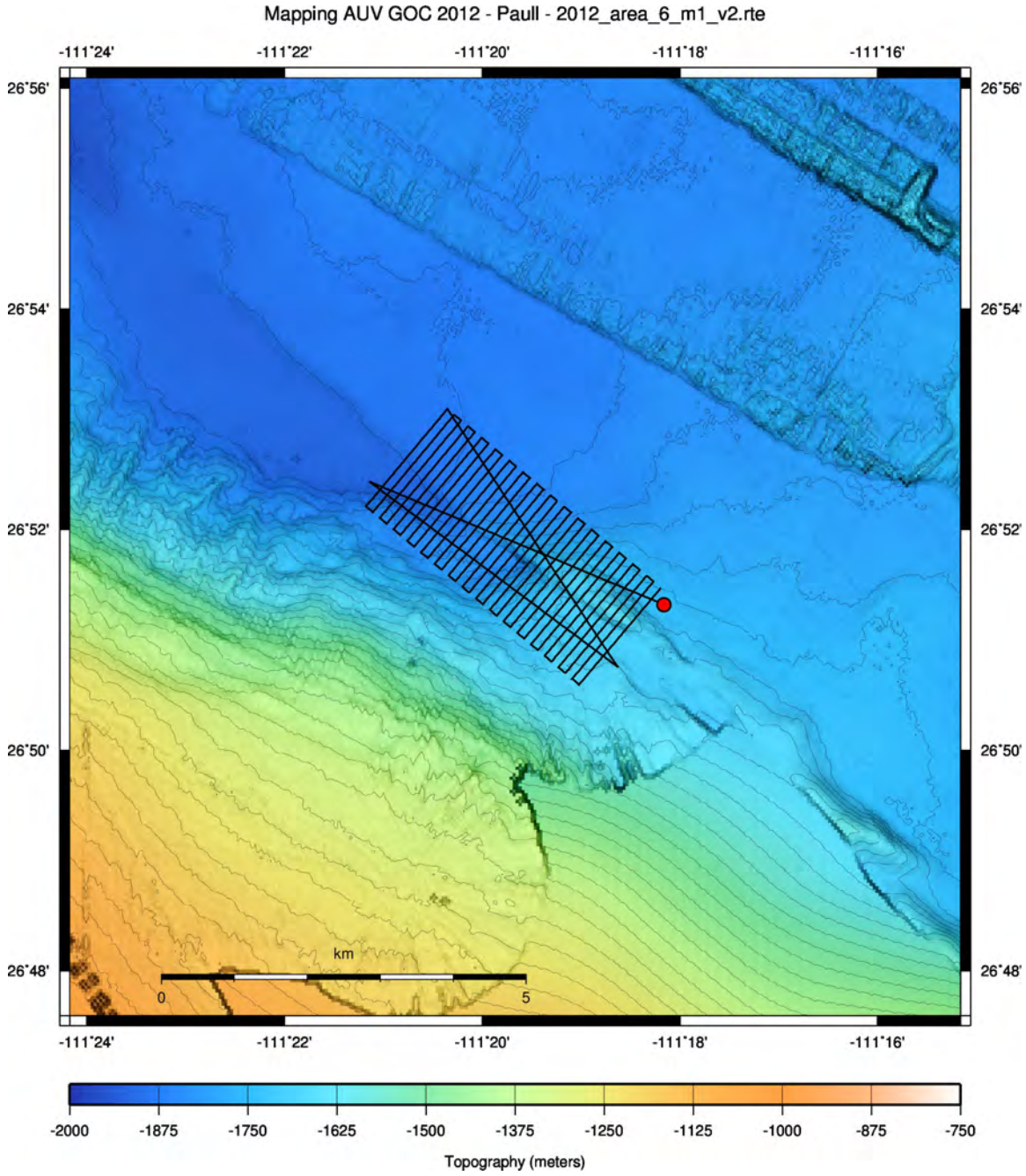
Site 2012_area_7_m1, 2nd survey planned for Leg 2. Bathymetry contoured at 25 m intervals.



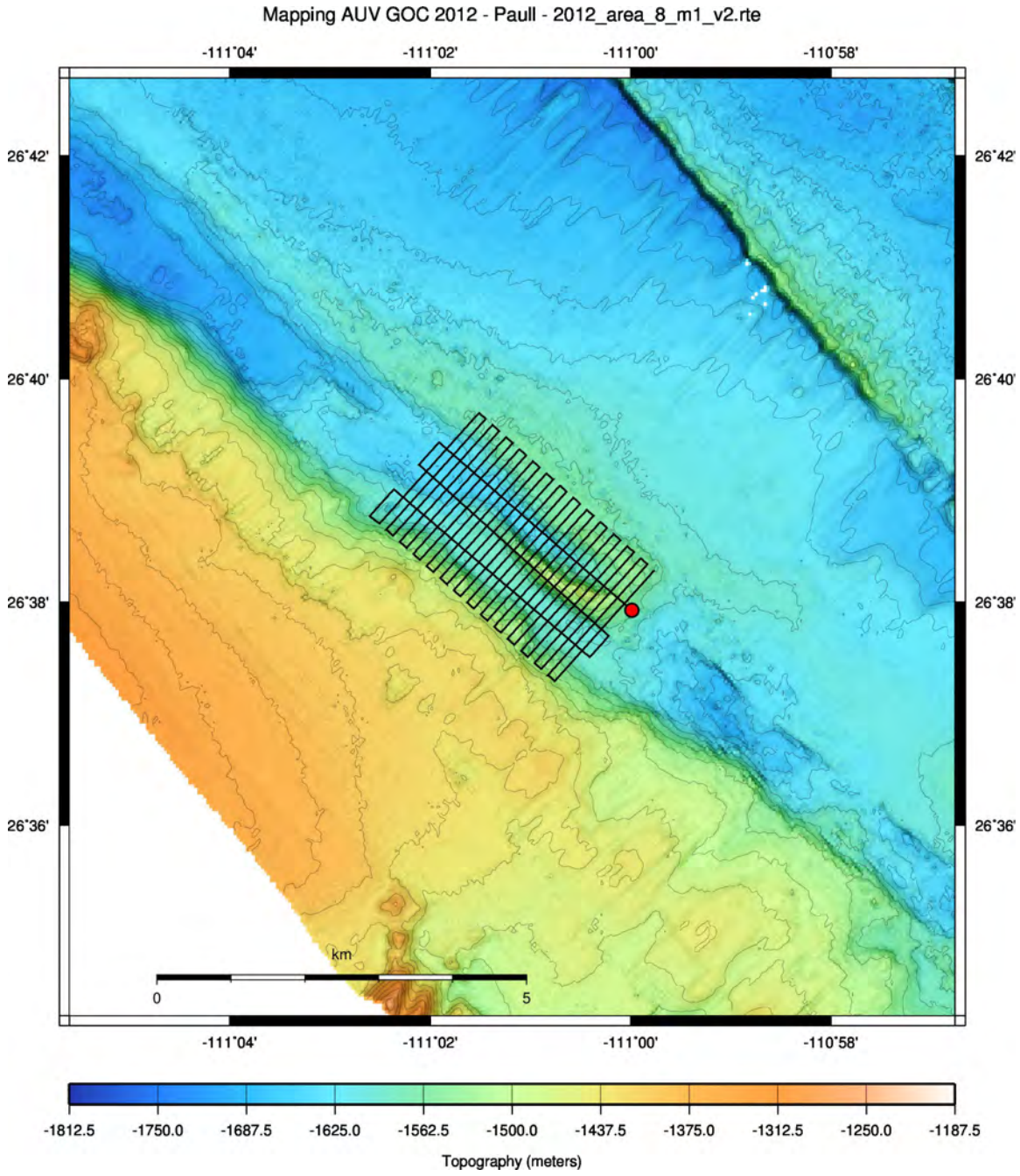
Site 2012_area_2_m1, 3rd survey planned for Leg 2. Bathymetry contoured at 25 m intervals.



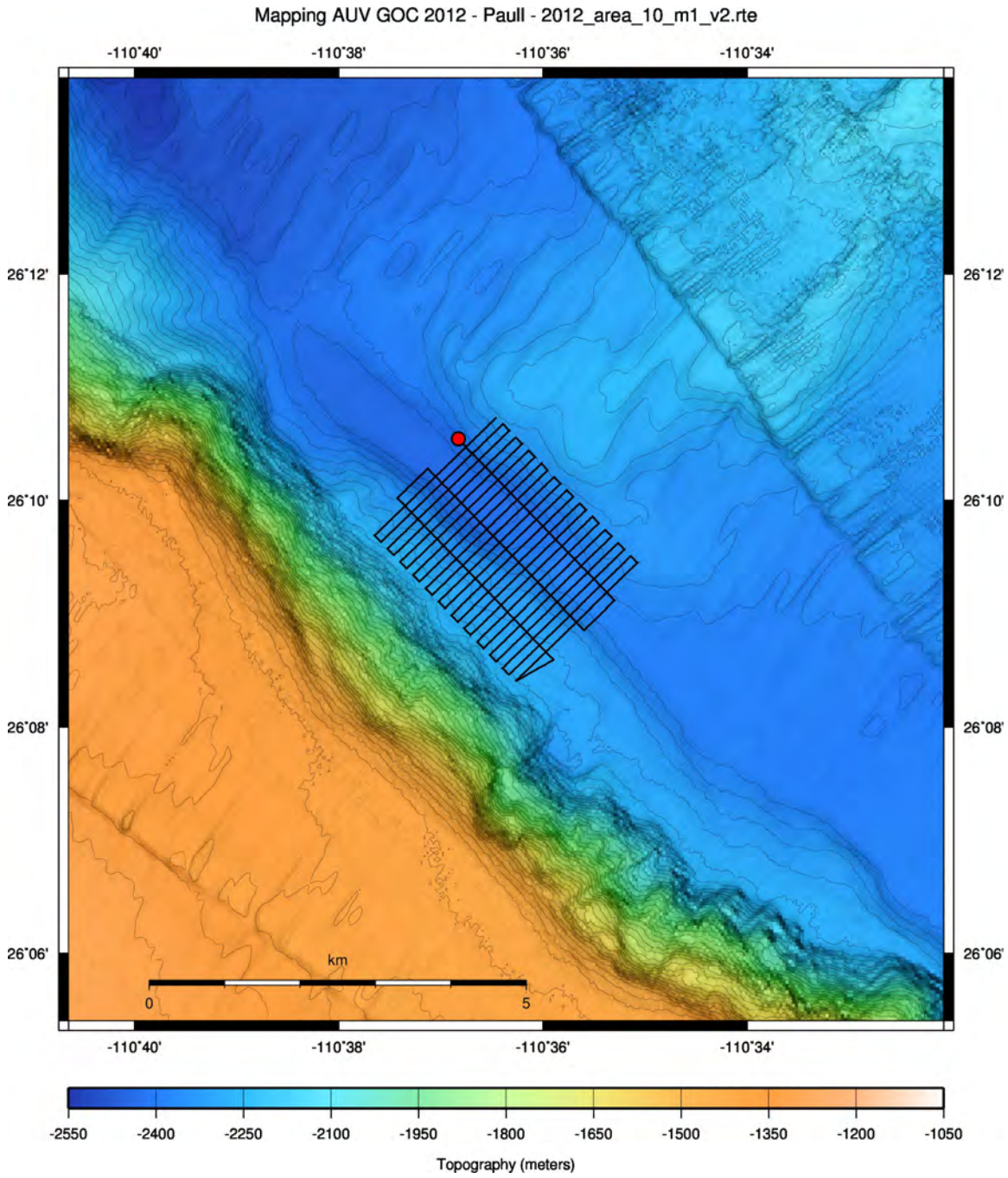
Site 2012_area_5_m2, 4th survey planned for Leg 2. Bathymetry contoured at 25 m intervals.



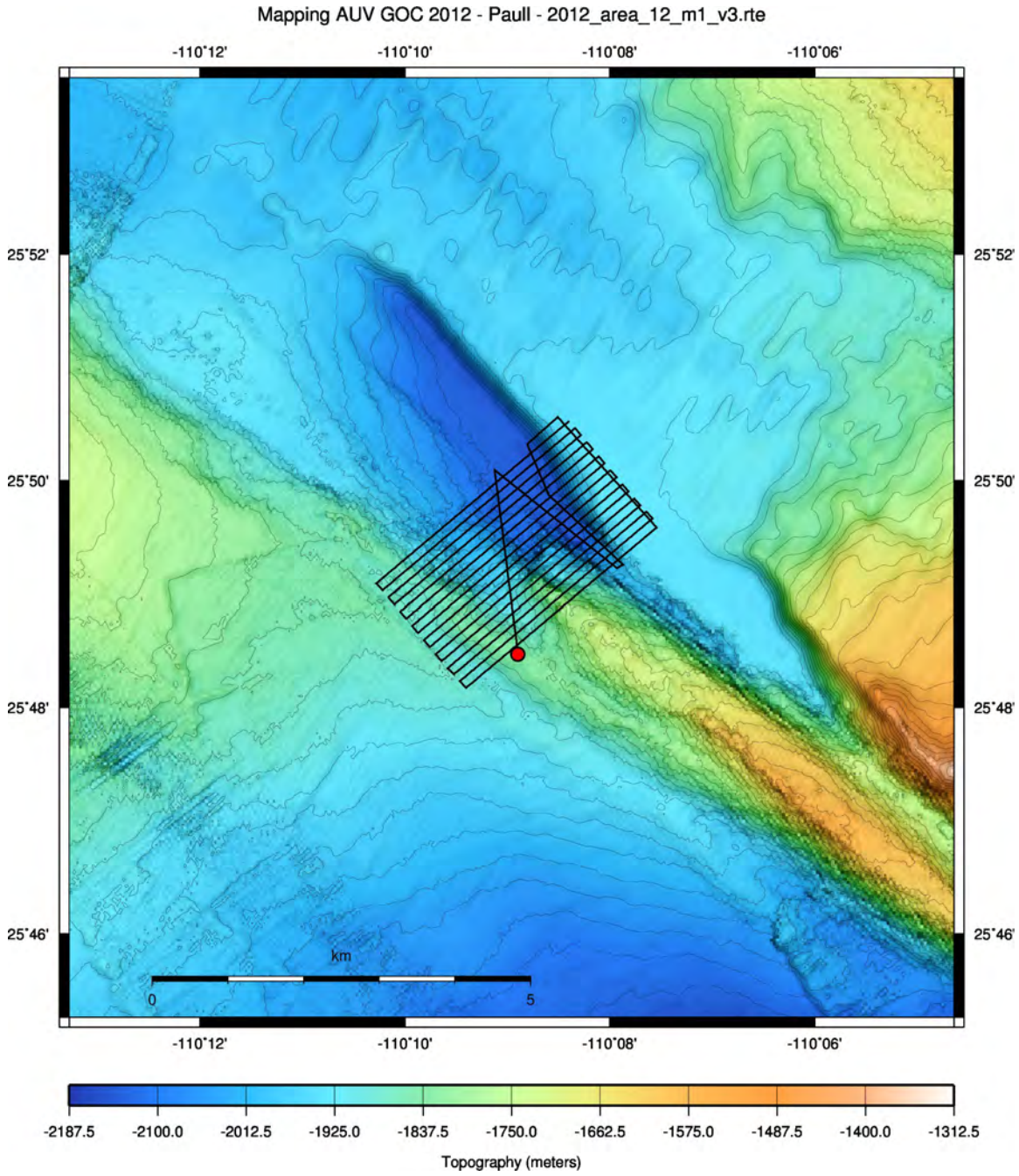
Site 2012_area_6_m1, 1st survey planned for Leg 3. Bathymetry contoured at 25 m intervals.



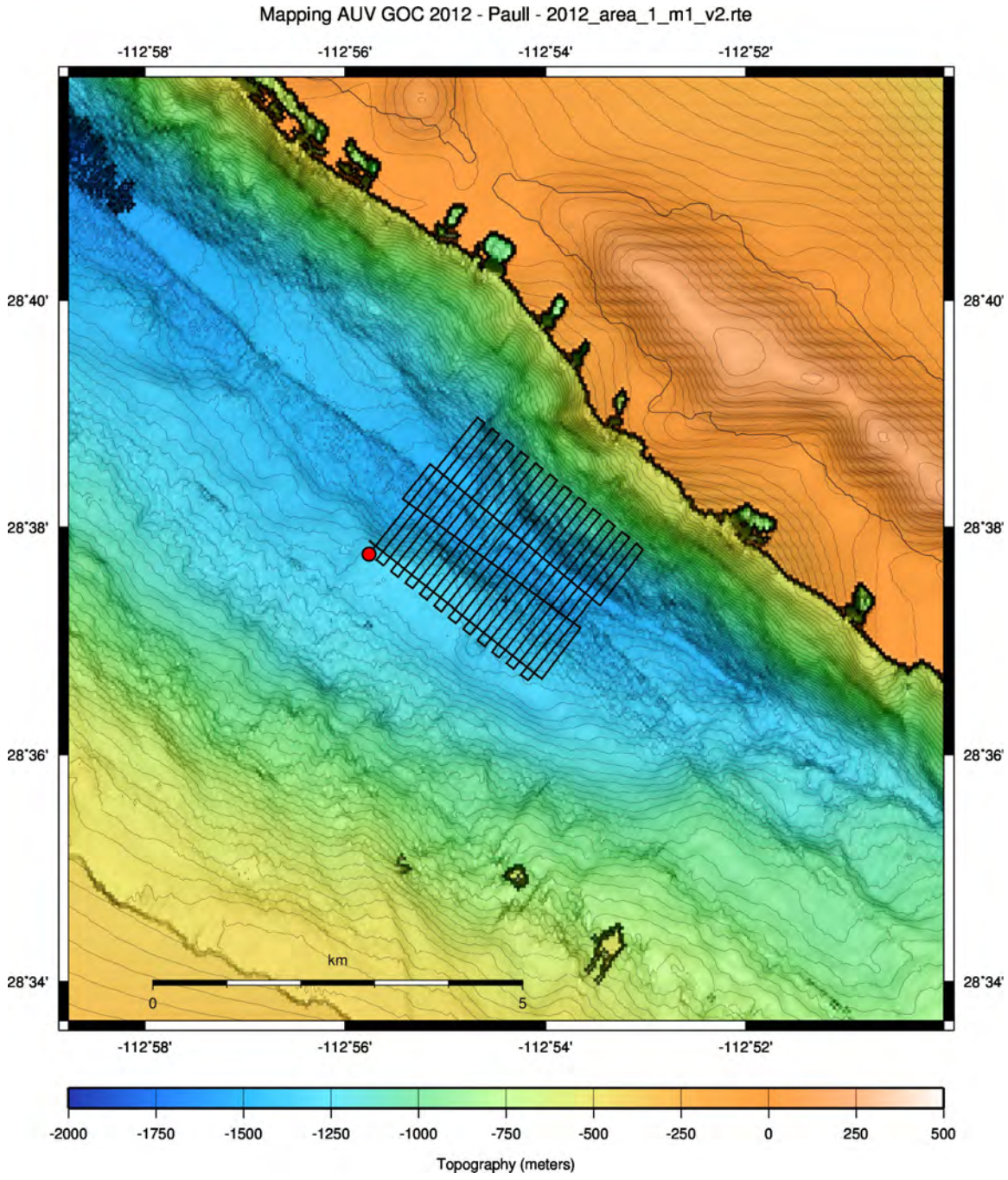
Site 2012_area_8_m1, 2nd survey planned for Leg 3. Bathymetry contoured at 25 m intervals.



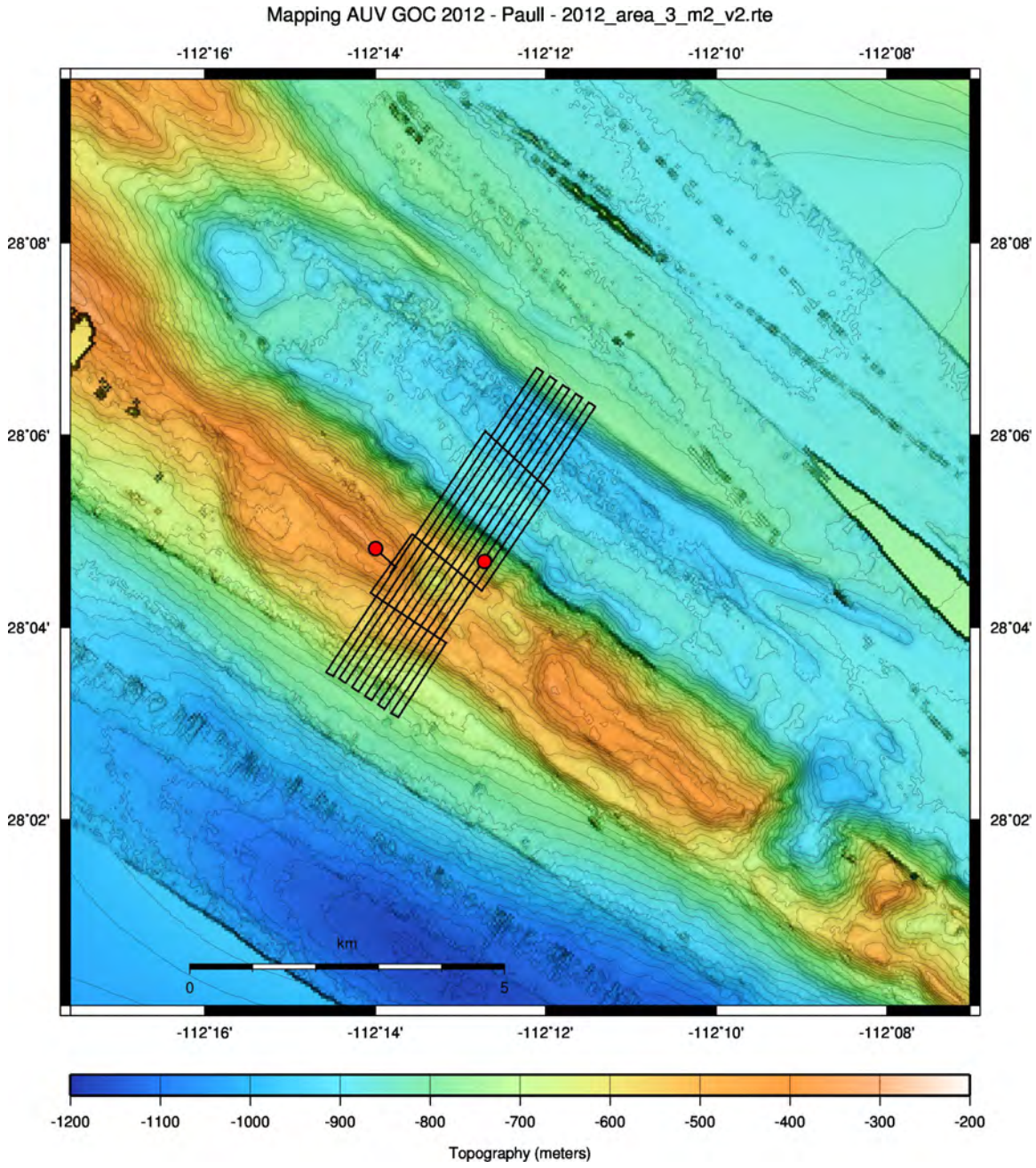
Site 2012_area_10_m1, 3rd survey planned for Leg 3. Bathymetry contoured at 25 m intervals.



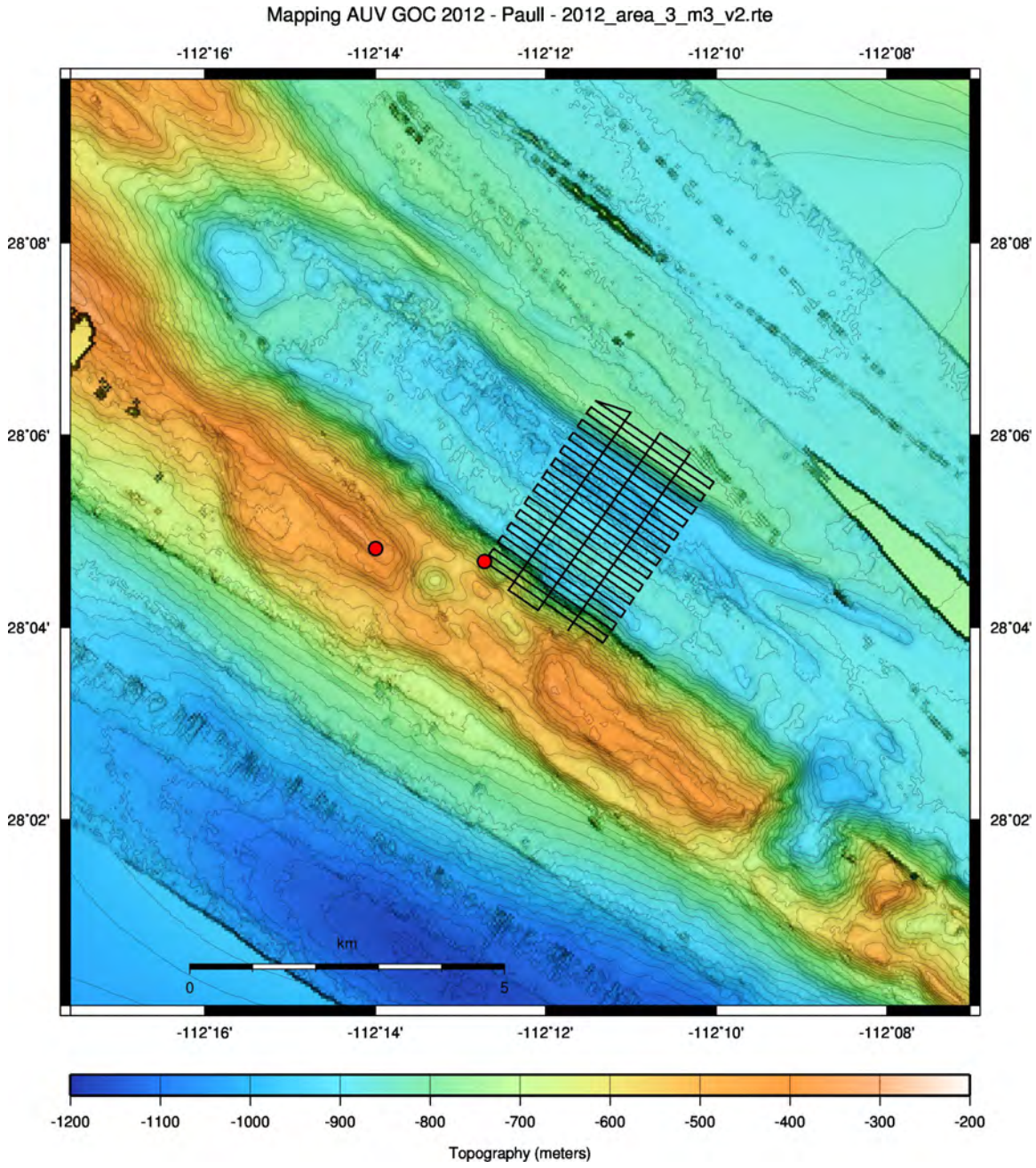
Site 2012_area_12_m1, 4th survey planned for Leg 3. Bathymetry contoured at 25 m intervals.



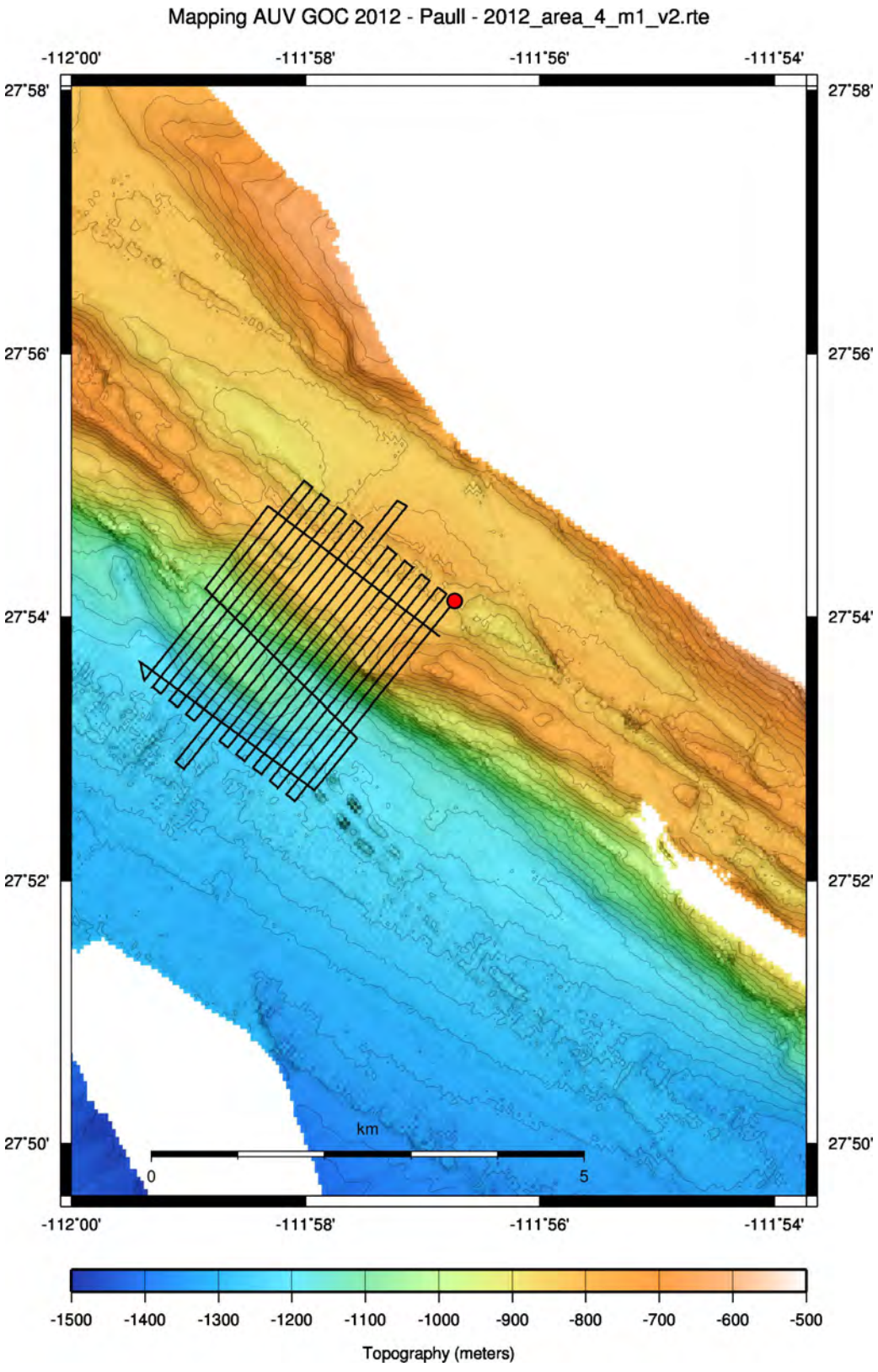
Site 2012_area_1_m1, contingency survey possibly done in place of Site 2012_area_2_m1 during leg 2. This site was dropped to contingency after R/V *Western Flyer* encountered extremely strong tidal currents at another location adjacent to an island during the Barry leg. Bathymetry contoured at 25 m intervals.



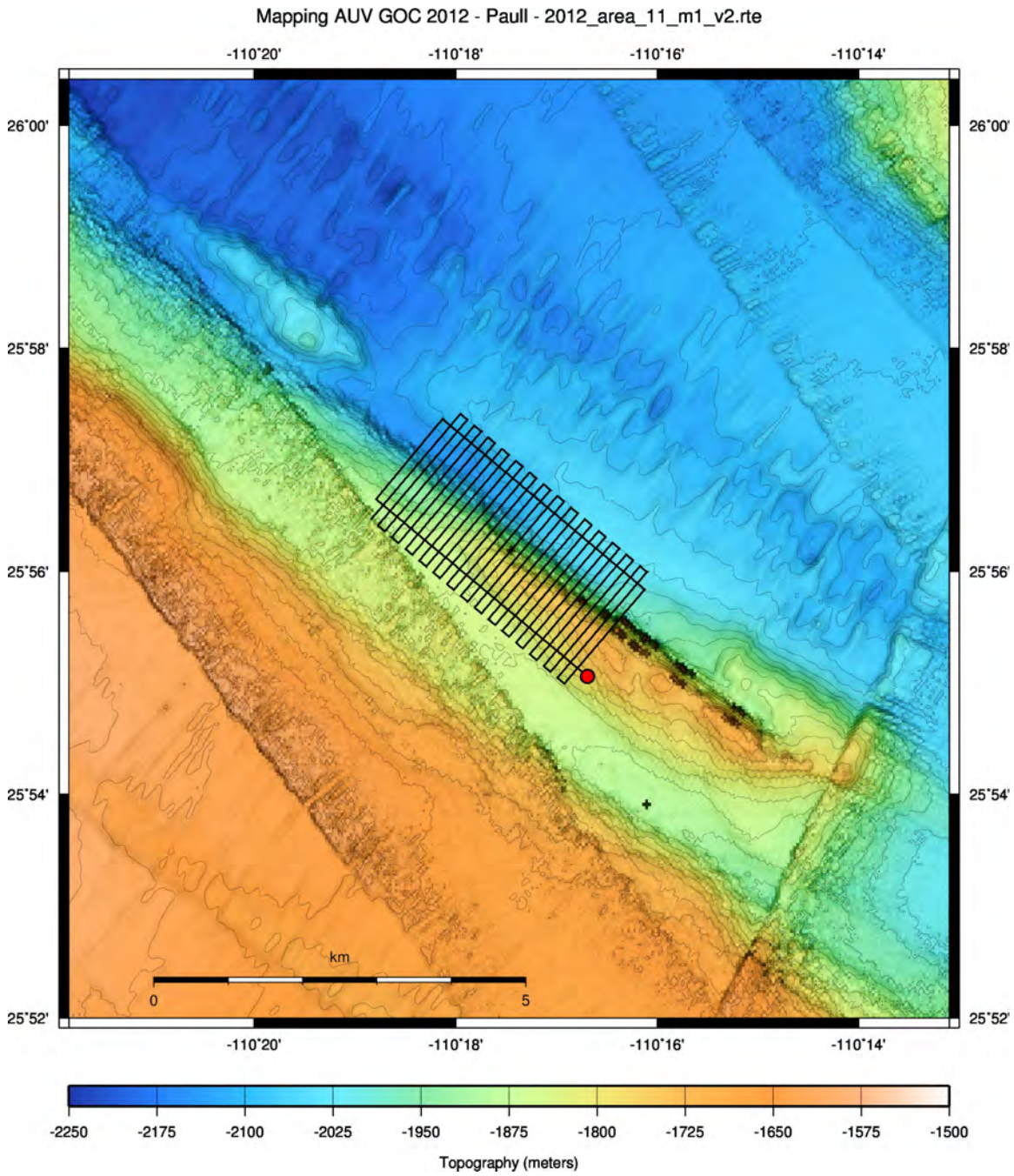
Site 2012_area_3_m2, contingency survey possibly done in place of Site 2012_area_1_m1 during leg 2. Bathymetry contoured at 25 m intervals.



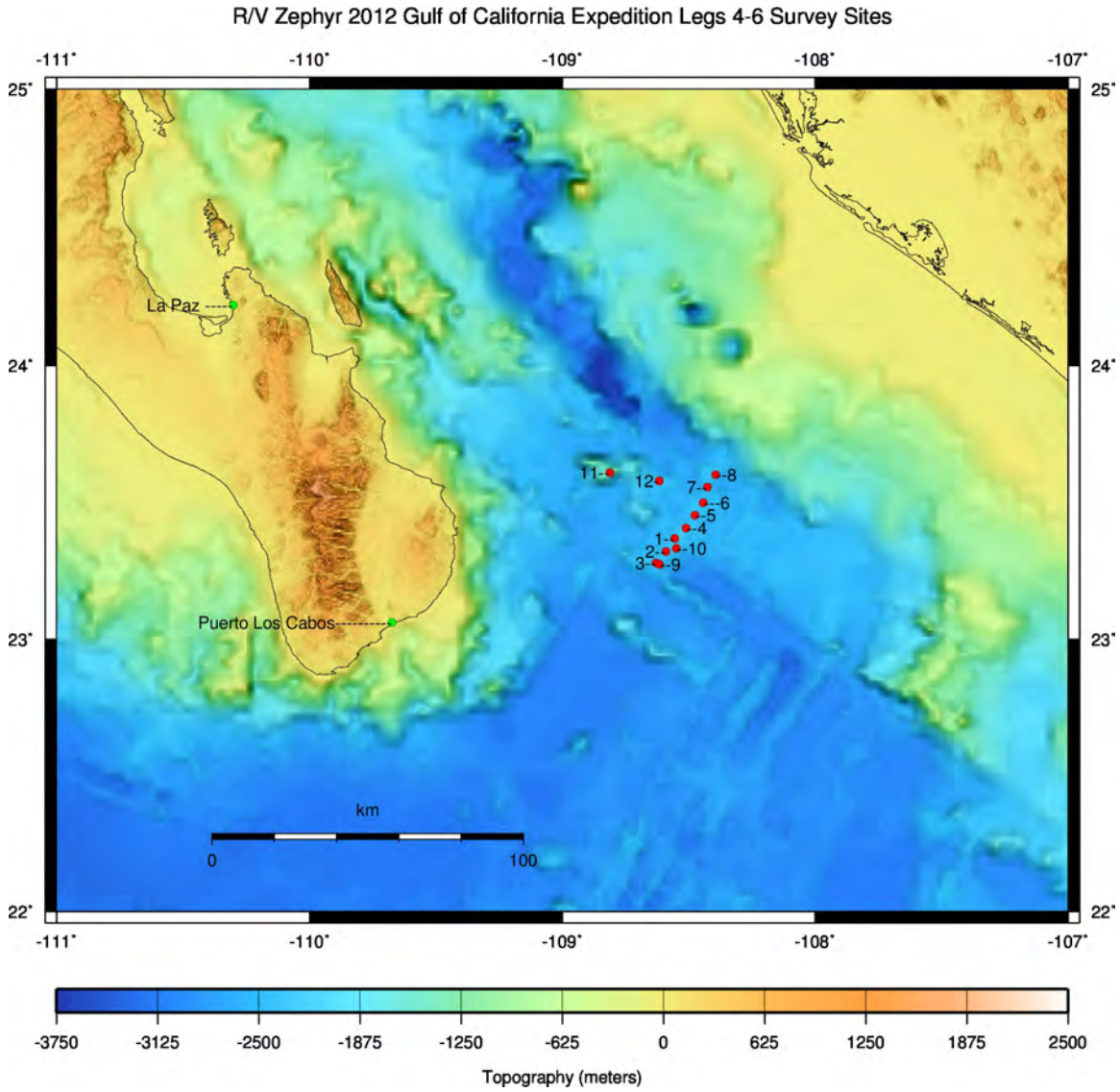
Site 2012_area_3_m3, contingency survey. Bathymetry contoured at 25 m intervals.



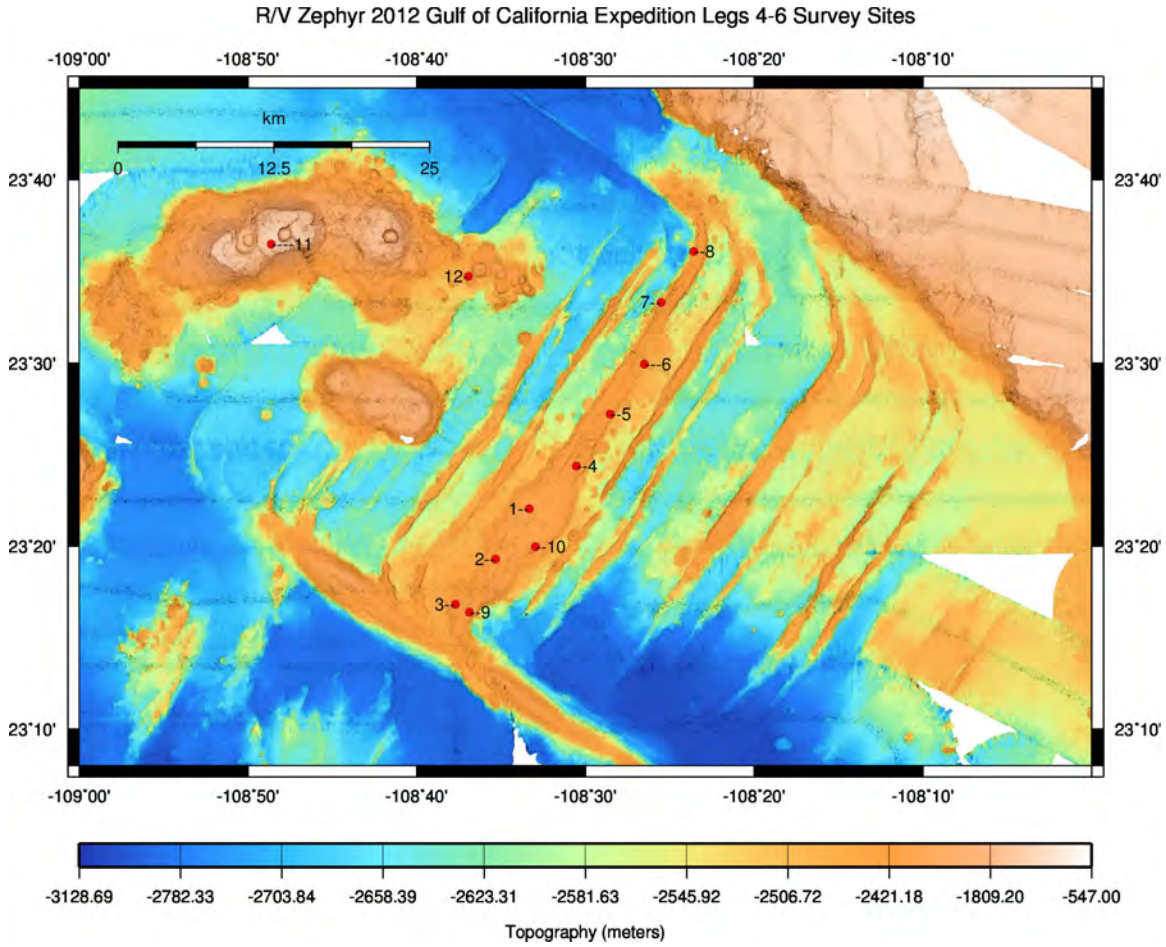
Site 2012_area_4_m1, contingency survey possibly done in place of Site 2012_area_1_m1 during leg 2. Bathymetry contoured at 25 m intervals.



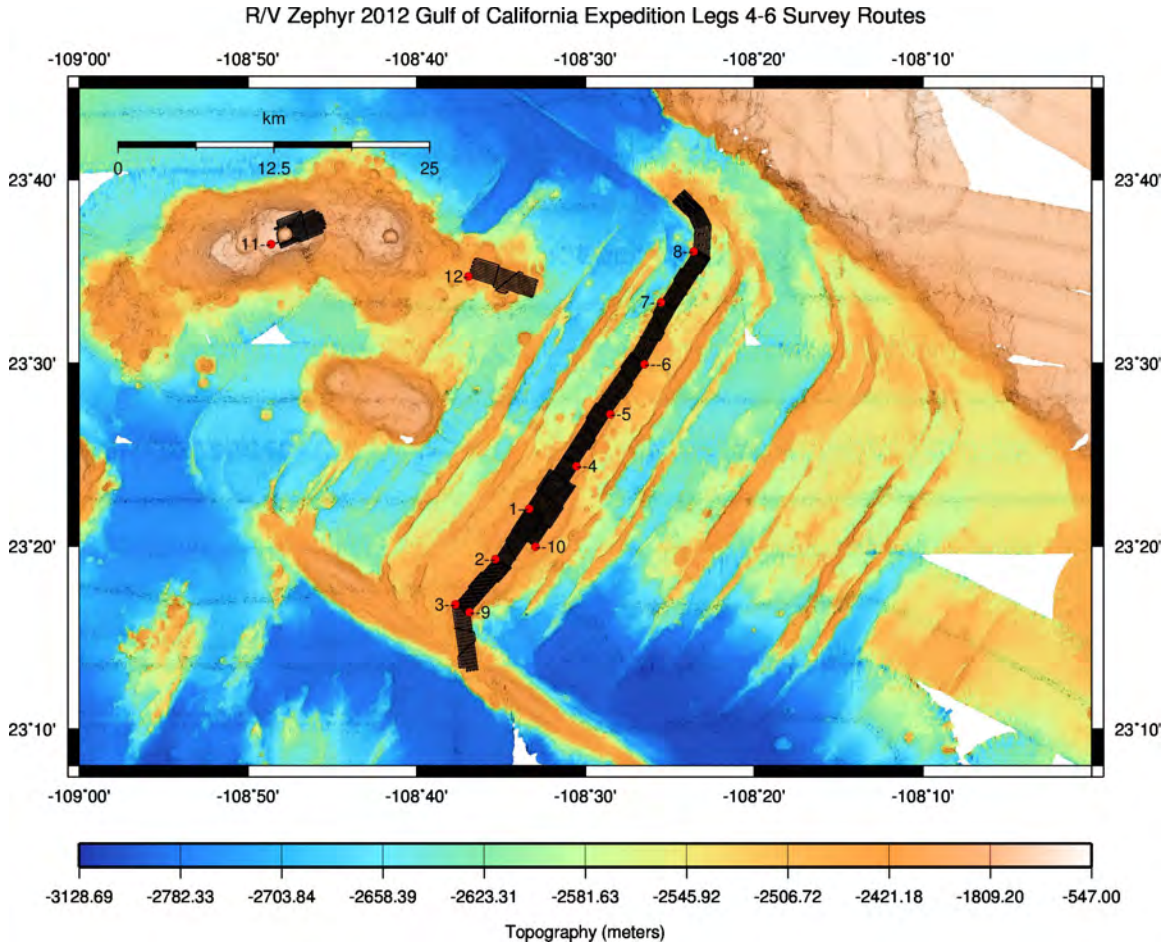
Site 2012_area_4_m1, contingency survey. Bathymetry contoured at 25 m intervals.



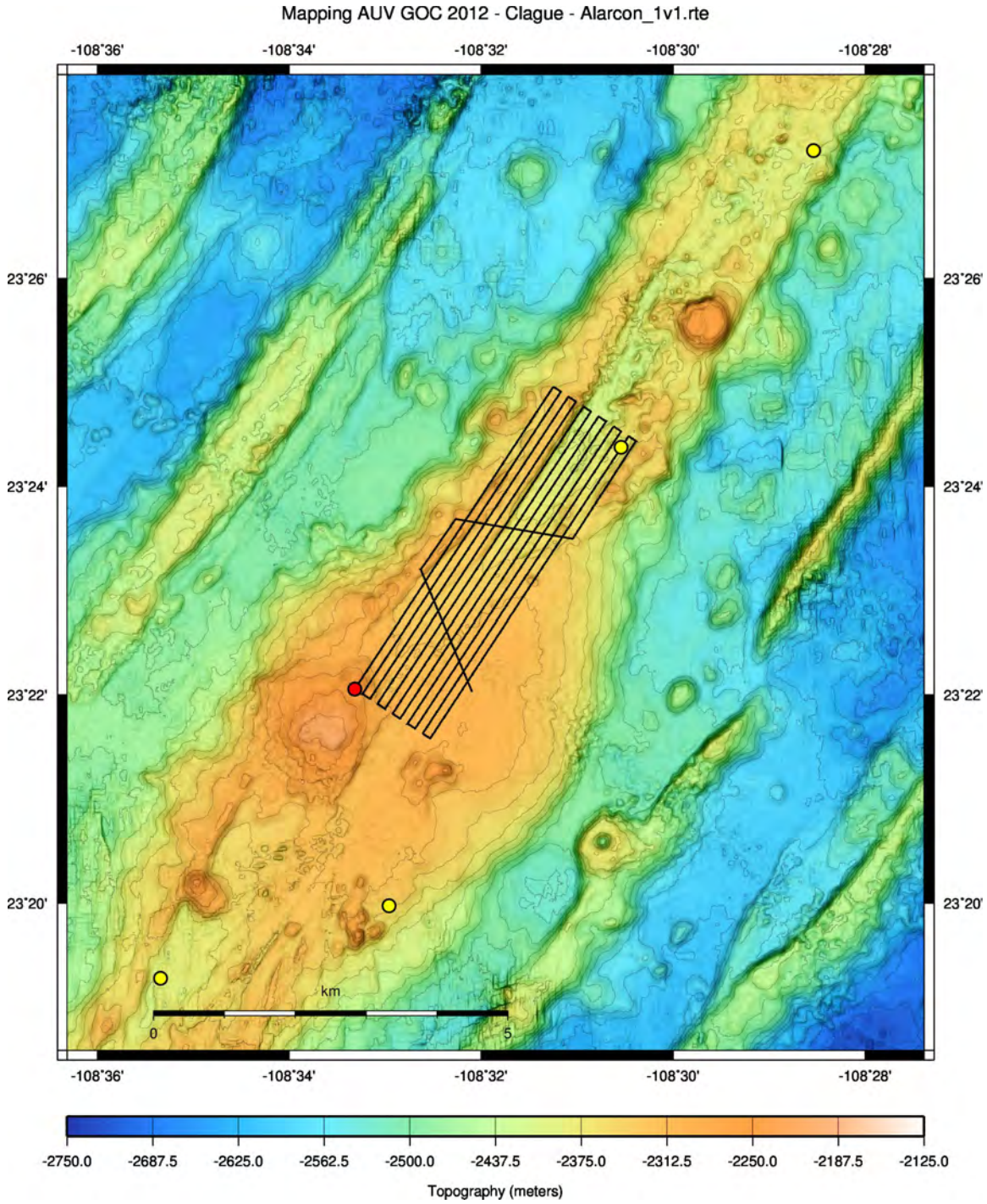
Locations of Mapping AUV survey launch points planned for legs 4-6. The surveys are prioritized in the order of the numbering. We will start with site 1 and keep going until we run out of time (or are done), with four surveys nominally planned for each leg.



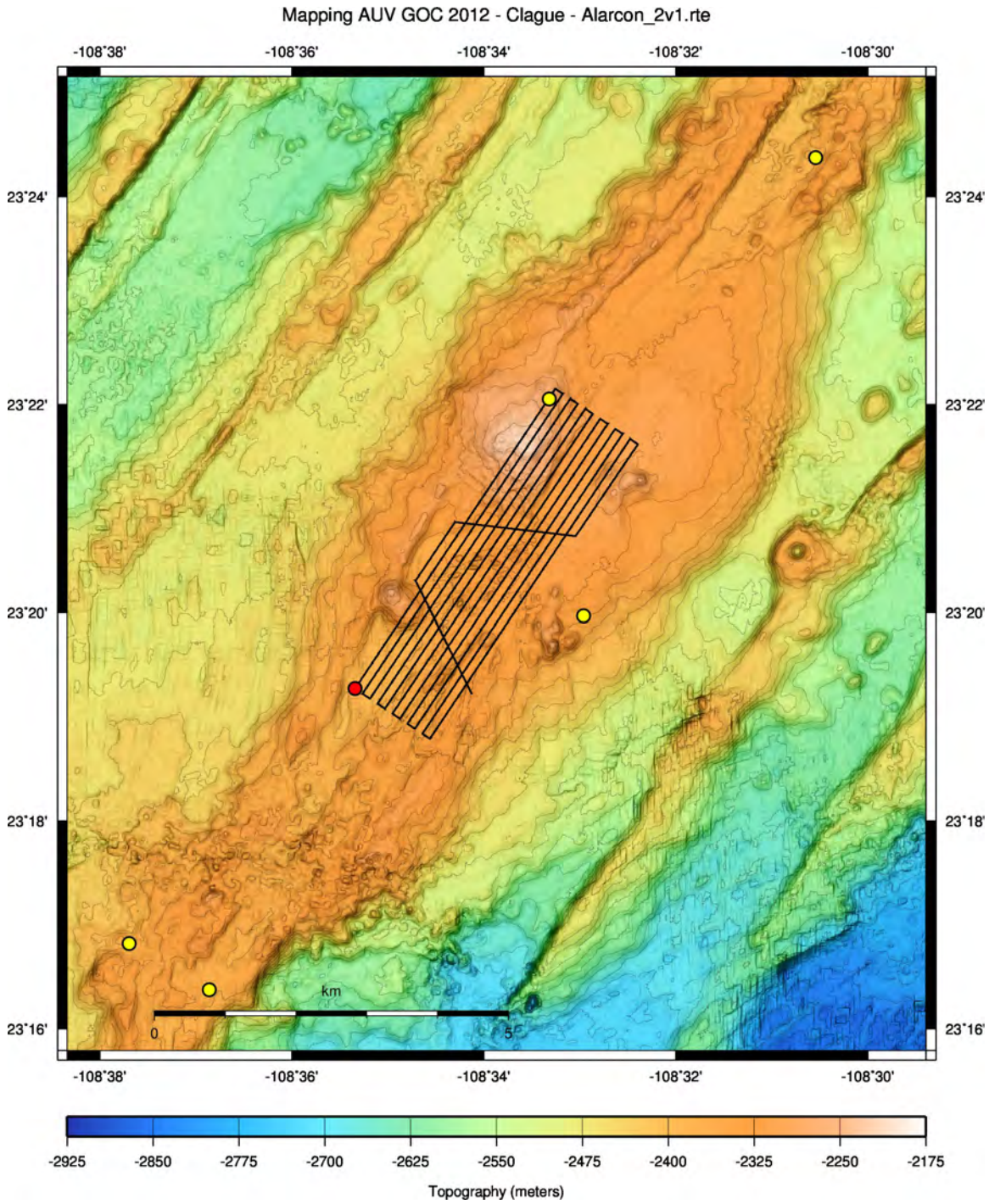
Locations of Mapping AUV survey launch points planned for legs 4-6. The surveys are prioritized in the order of the numbering. We will start with site 1 and keep going until we run out of time (or are done), with four surveys nominally planned for each leg.



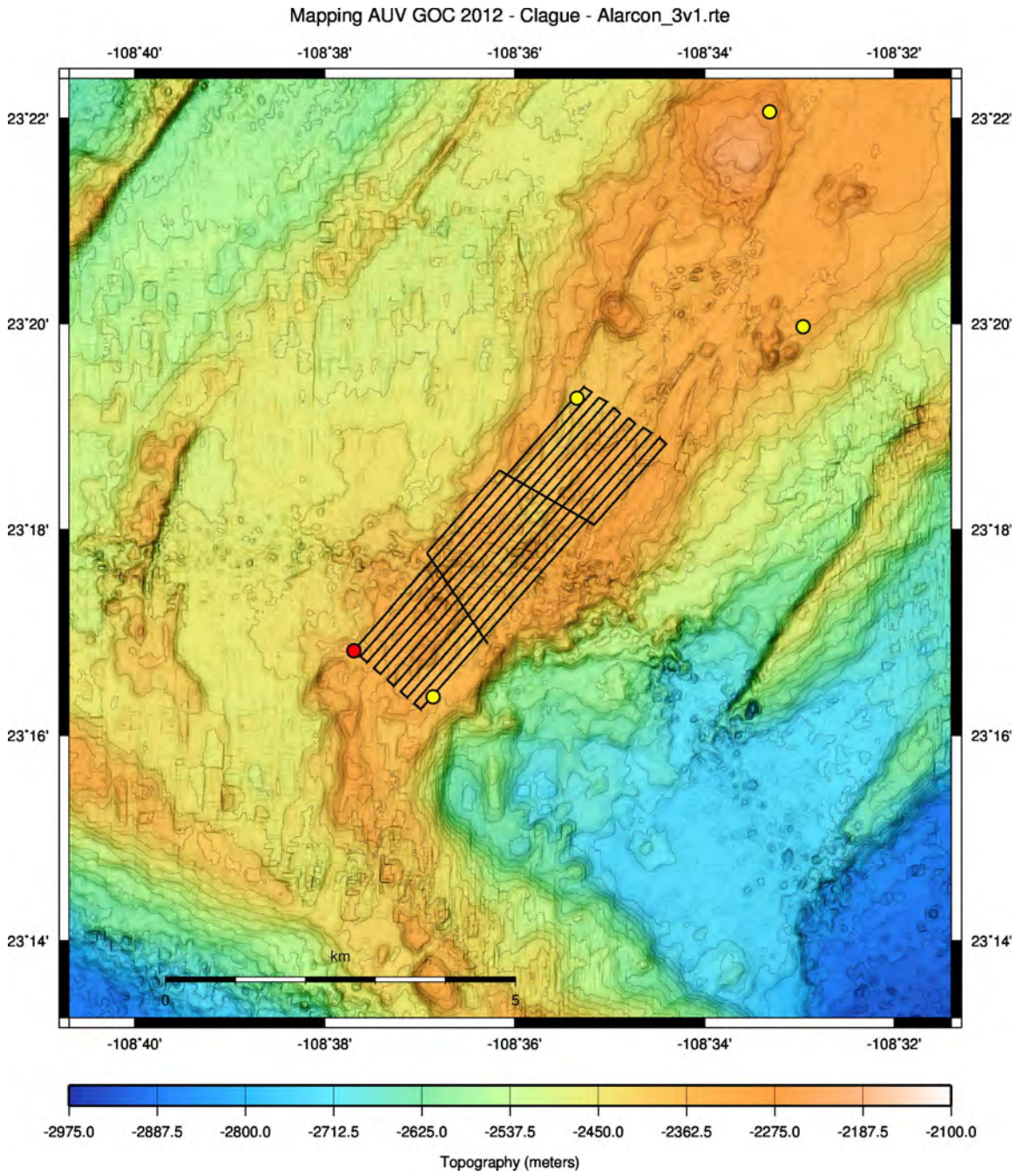
Mapping AUV survey routes planned for legs 4-6. The surveys are prioritized in the order of the numbering. We will start with site 1 and keep going until we run out of time (or are done), with four surveys nominally planned for each leg. Surveys 1-10 will, if completed, provided the first-ever complete coverage of a spreading center segment axis at 1-m resolution.



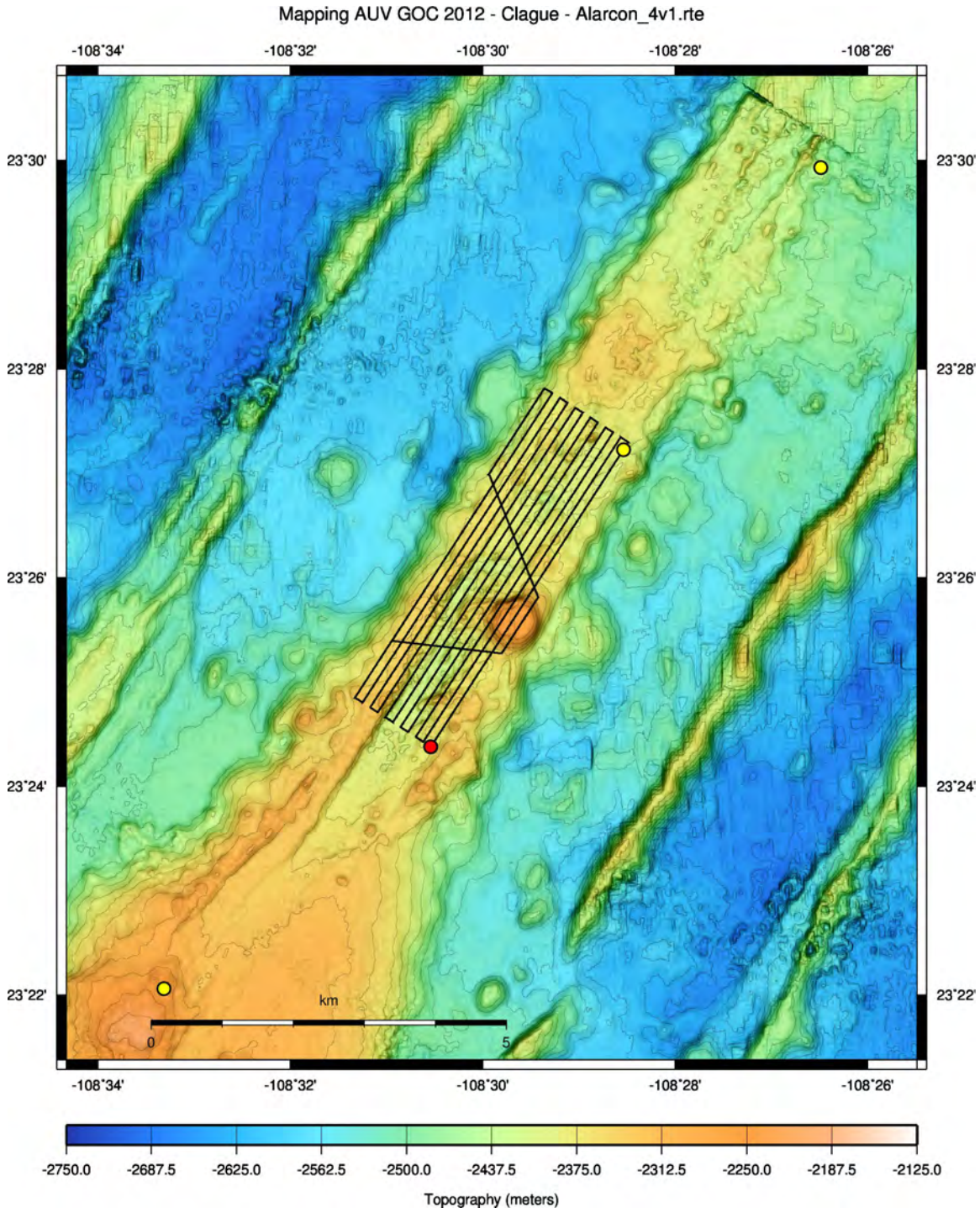
Site Alarcon_1v1, 1st survey planned for Leg 4. Bathymetry contoured at 25 m intervals.



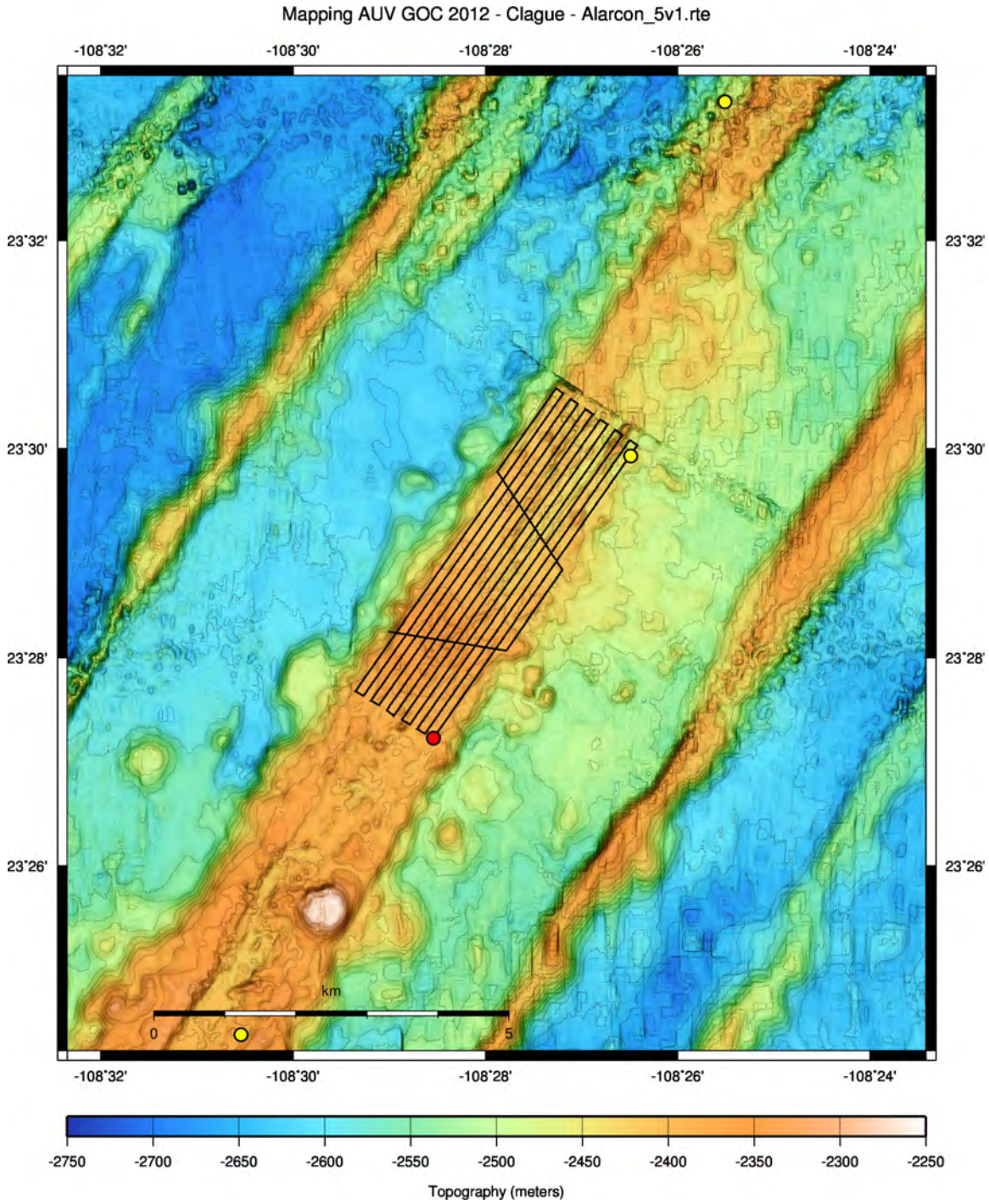
Site Alarcon_2v1, 2nd survey planned for Leg 4. Bathymetry contoured at 25 m intervals.



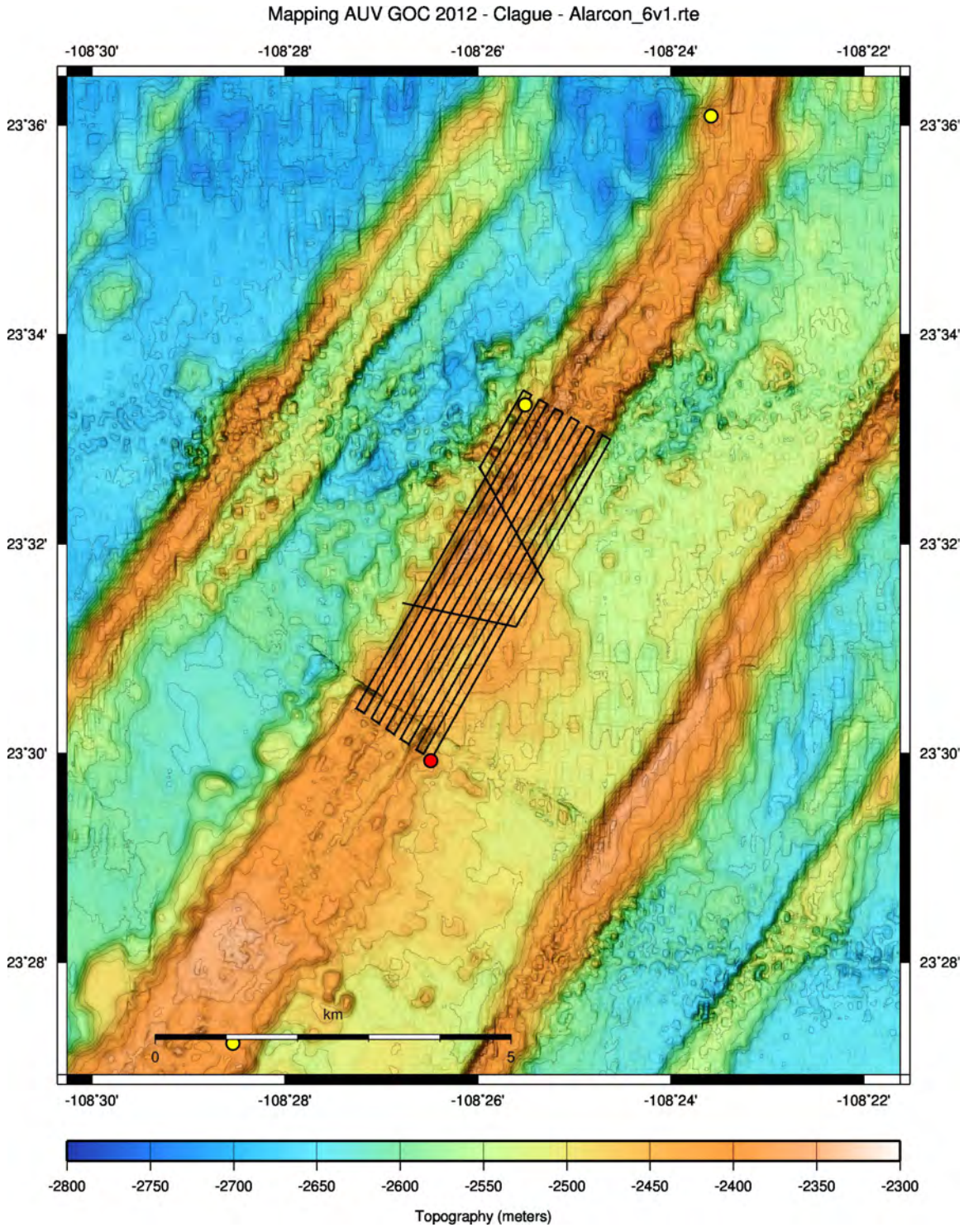
Site Alarcon_3v1, 3rd survey planned for Leg 4. Bathymetry contoured at 25 m intervals.



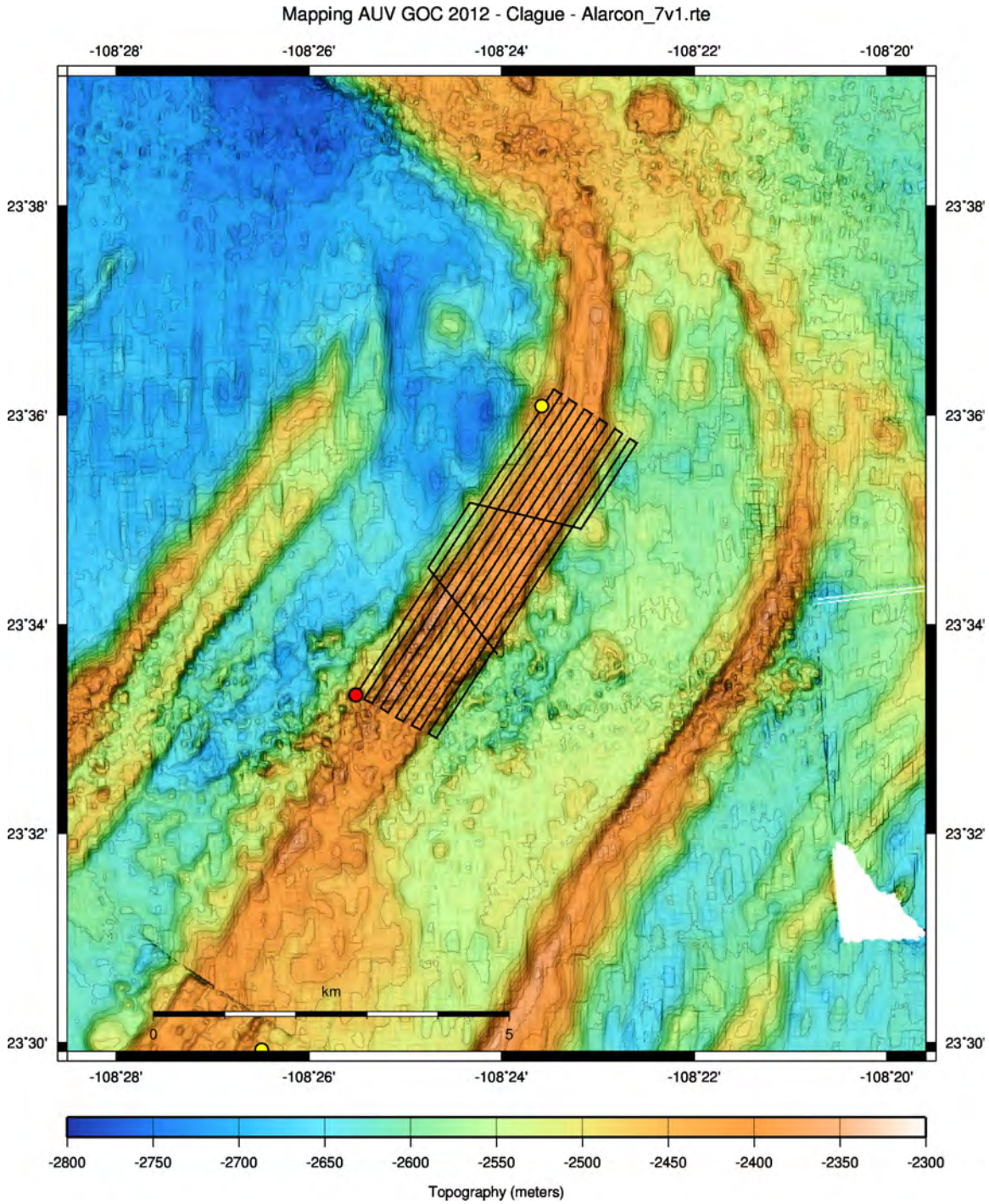
Site Alarcon_4v1, 4th survey planned for Leg 4. Bathymetry contoured at 25 m intervals.



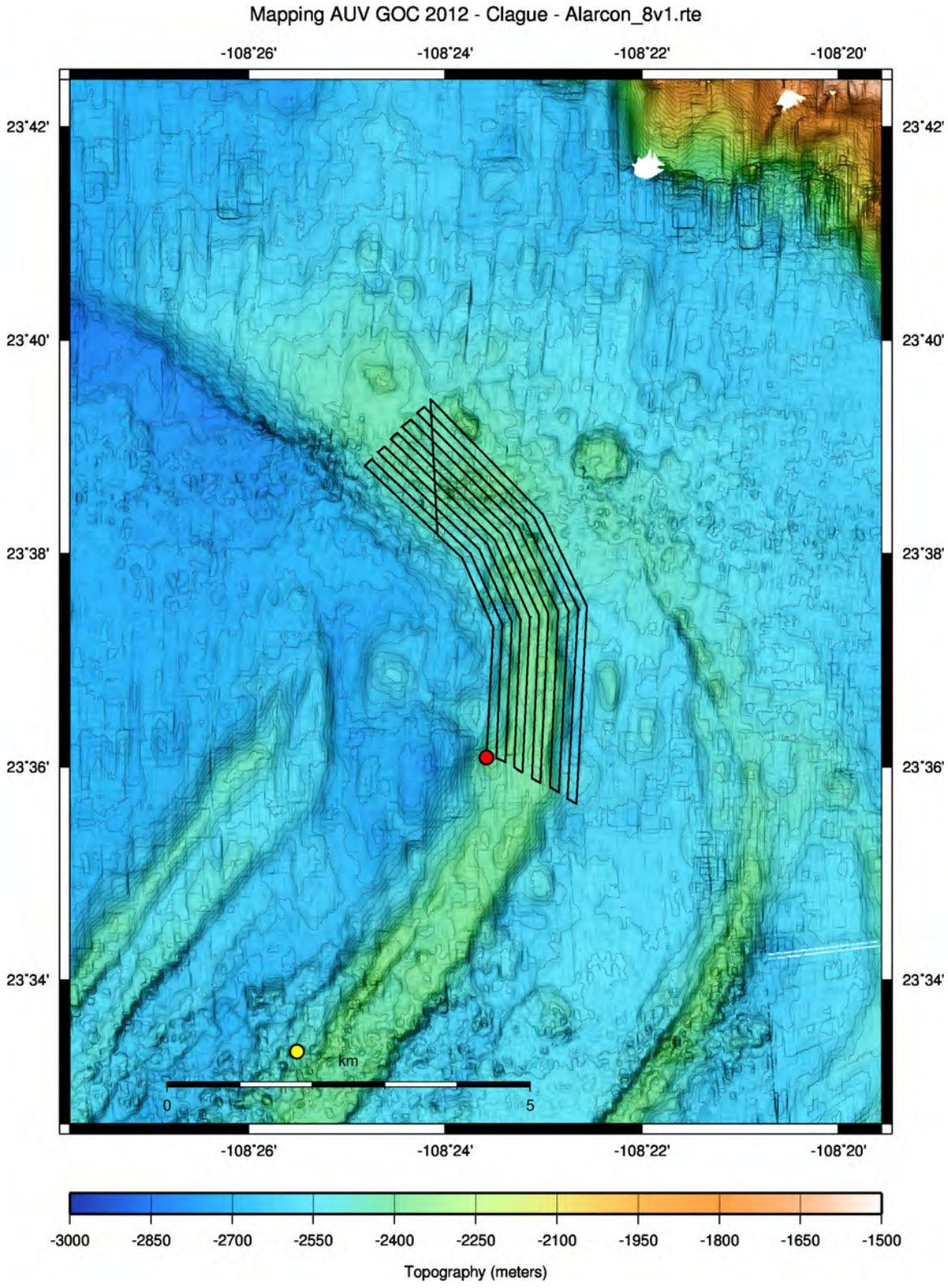
Site Alarcon_5v1, 1st survey planned for Leg 5. Bathymetry contoured at 25 m intervals.



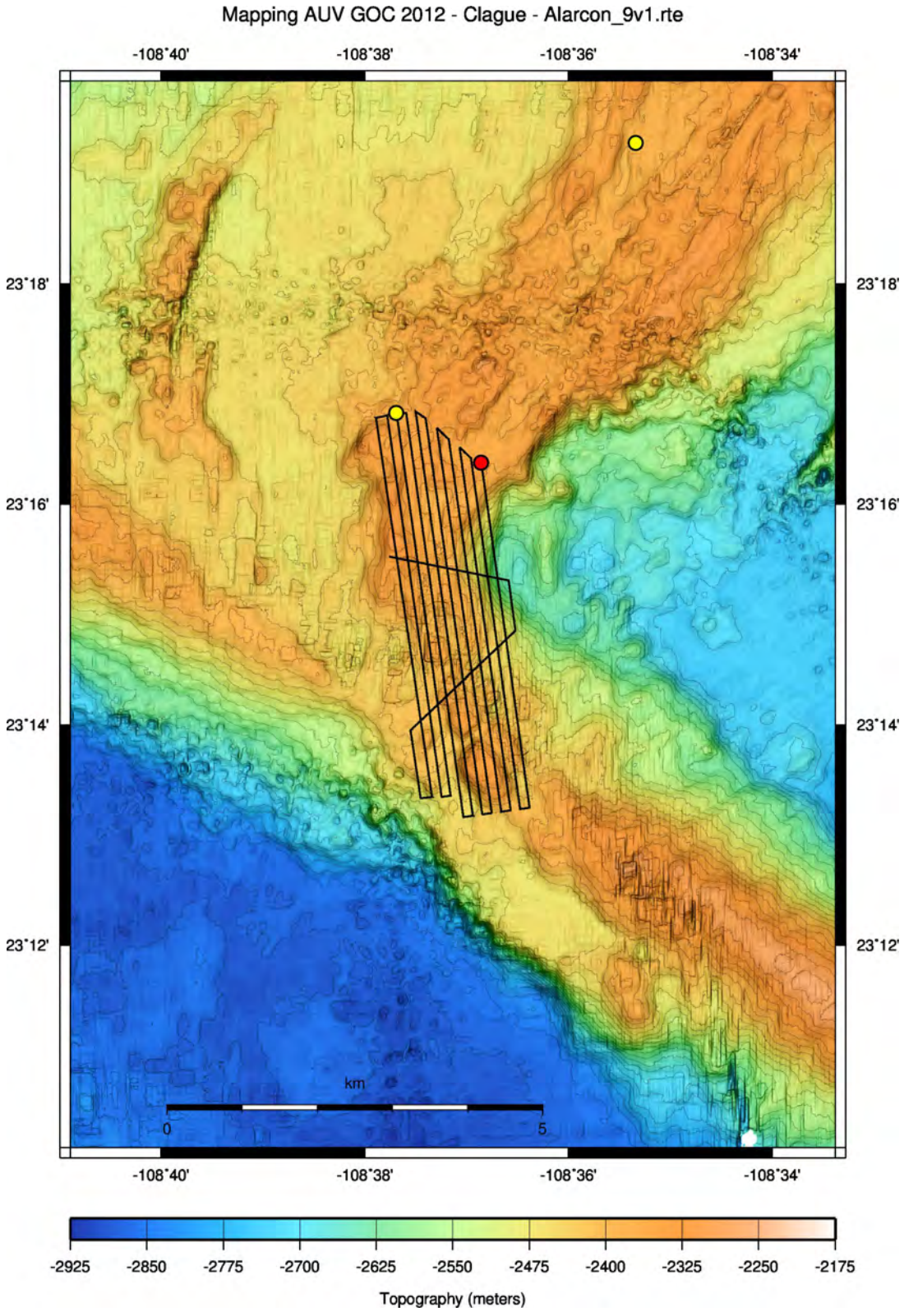
Site Alarcon_6v1, 2nd survey planned for Leg 5. Bathymetry contoured at 25 m intervals.



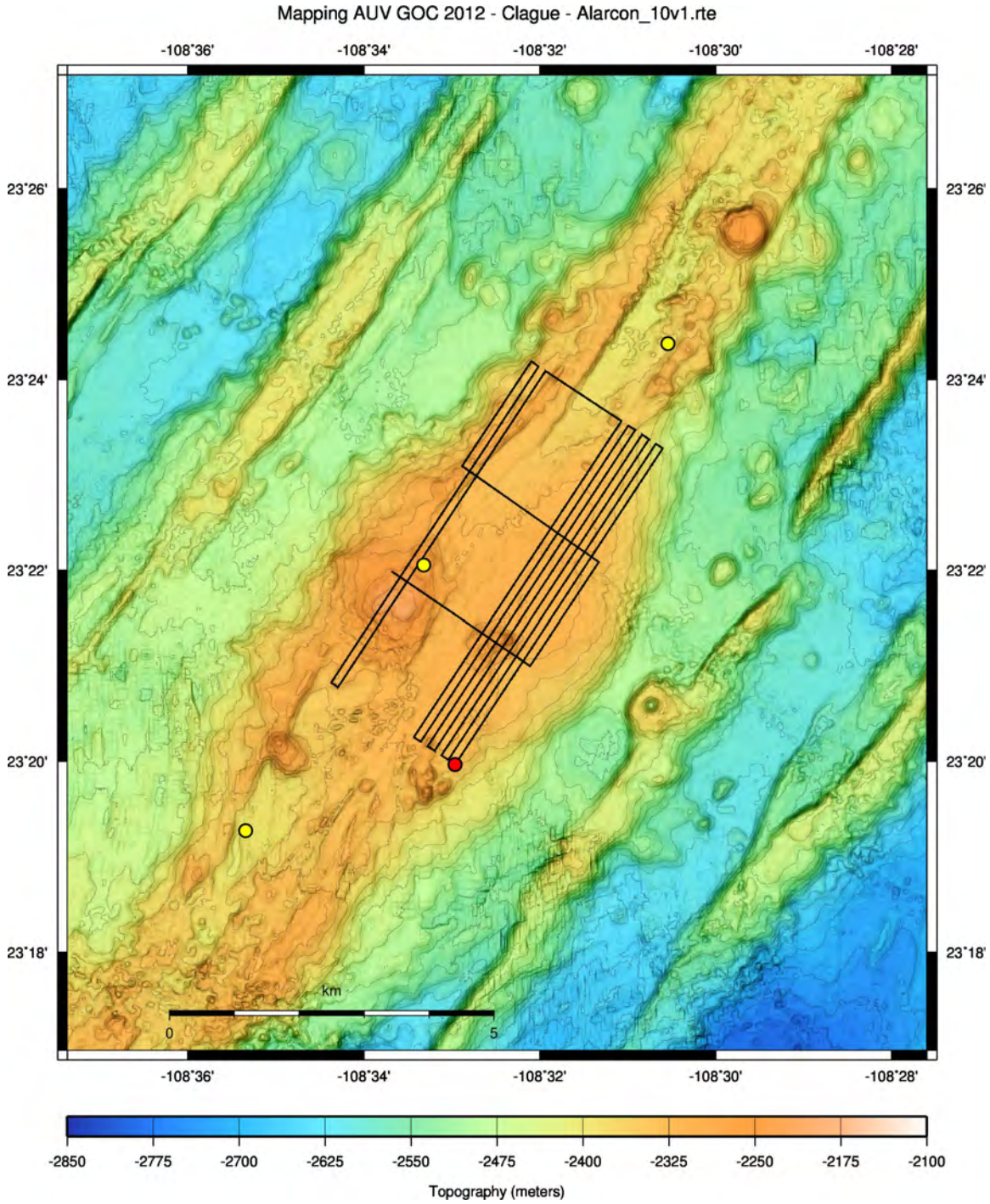
Site Alarcon_7v1, 3rd survey planned for Leg 5. Bathymetry contoured at 25 m intervals.



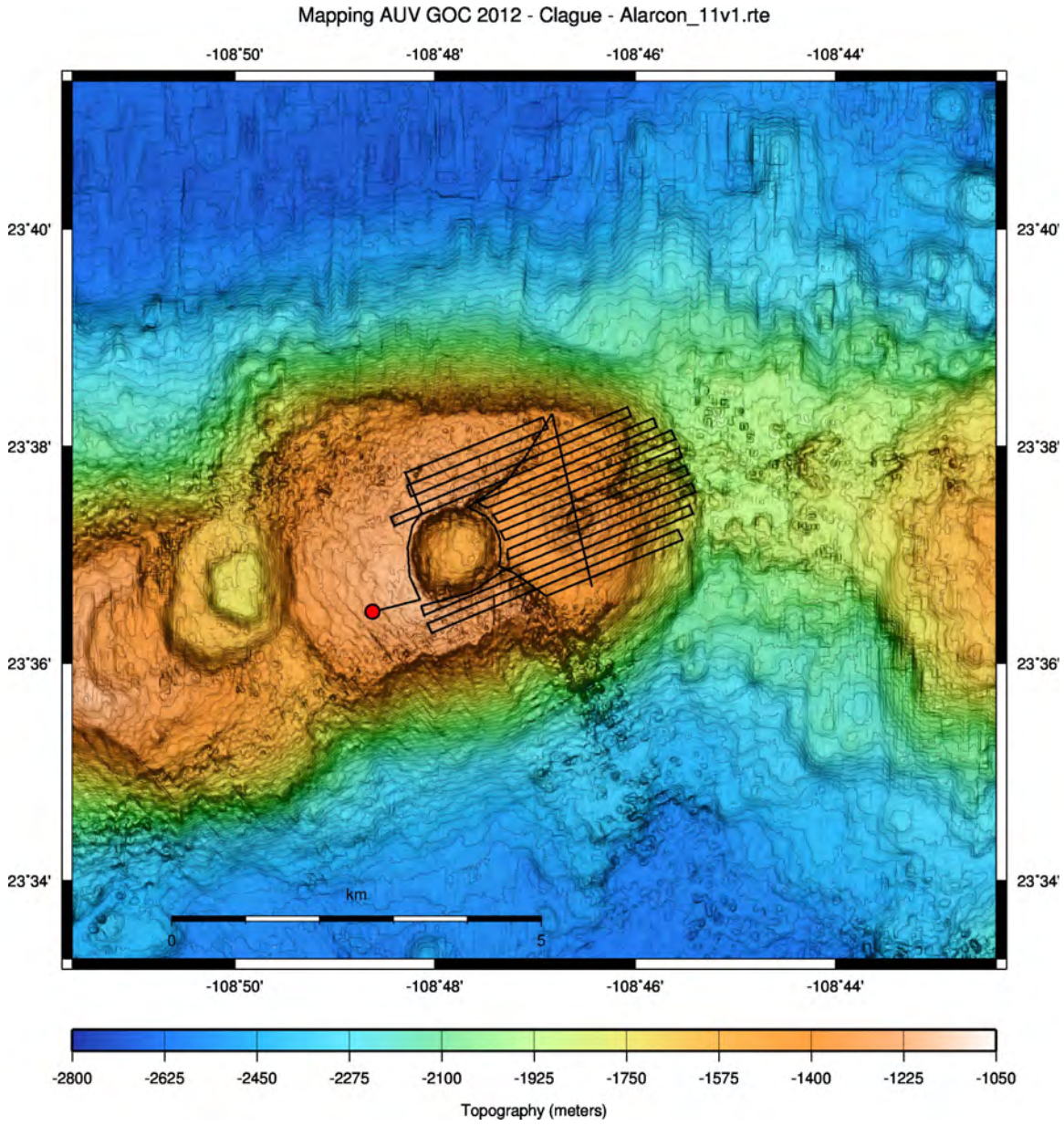
Site Alarcon_8v1, 4th survey planned for Leg 5. Bathymetry contoured at 25 m intervals.



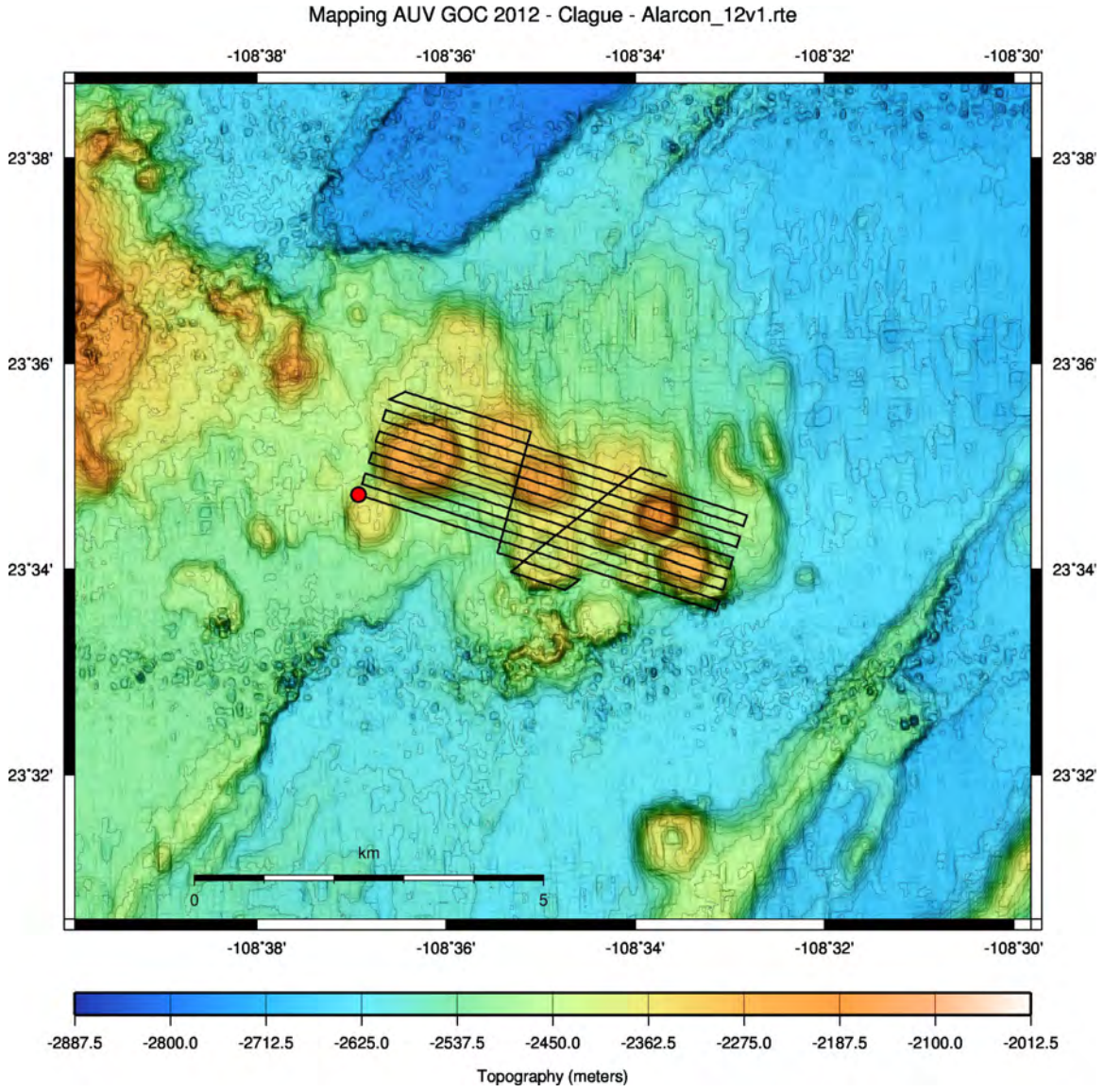
Site Alarcon_9v1, 1st survey planned for Leg 6. Bathymetry contoured at 25 m intervals.



Site Alarcon_10v1, 2nd survey planned for Leg 6. Bathymetry contoured at 25 m intervals.



Site Alarcon_11v1, 3rd survey planned for Leg 6. Bathymetry contoured at 25 m intervals.



Site Alarcon_12v1, 4th survey planned for Leg 6. Bathymetry contoured at 25 m intervals.