May 5, 2011

Project Leader:	Rosen
Project Number:	R/MPA-8
Award #:	09-015
Campus Account or PO#:	10306234

Re: Project Status Report: Year #1

MARE together with our partner Cal State Monterey Bay (CSUMB) had a stellar first field season. We collected approximately 240 hours of video and nearly 8,600 digital still images of the seafloor. MARE is now preparing the ROV for this upcoming season while CSUMB continues to post process the data (geo-referenced video and digital still images).

We effectively spent the entire month of July 2010 offshore, successfully completing all four sets of sites at the Farallon Islands, Half Moon Bay, Bodega Bay and Pt. Arena in year one. Due to superb weather and teamwork aboard the Fishing Vessel Donna Kathleen we were even able to add a day prospecting off Point Reyes National Seashore and finish on time. We also cycled through a half dozen CSUMB students and several observers, and did a fair bit of community outreach especially around the port of Pt. Arena where folks were pretty suspicious of our presence. This winter MARE is modifying the Remotely Operated Vehicle (ROV) to simplify operations and improve reliability based upon lessons learned in 2010. CSUMB has completed their rapid video assessment and is starting still photo metrics and detailed video metrics of the data from the cruise.

North Central California Coast MPA Baseline
ROV Data Collection for Deep Benthic Rock and
Soft-Bottom Ecosystem Characterization and Monitoring (20 -116 m)

Annual Report (Year 1)

China rockfish (*Sebastes nebulosus*) sheltering within the rocky habitat at South Farallon Island

A Report to California Sea Grant

Project # R/MPA-8; Grant Number: 09-015

31 March 2011

Submitted by:

James Lindholm, Institute for Applied Marine Ecology,
California State University Monterey Bay (IfAME/CSUMB)
Dirk Rosen, Marine Applied Research and Exploration (MARE)
Donna Kline, IfAME/CSUMB
Jessica Watson, IfAME/CSUMB
Adam Alfasso, IfAME/CSUMB
Bryon Downey, IfAME/CSUMB

Acknowledgements

Funding provided by:

California Ocean Protection Council
California Sea Grant
Undergraduate Research Opportunities Center (UROC) at California State University Monterey Bay
James W. Rote Professorship of Marine Science and Policy at California State University Monterey Bay

Key Partnerships:

Dr. Mary Gleason - The Nature Conservancy - California Marine Program
Dr. William Head and Jessica Brown - Undergraduate Research Opportunities Center (UROC) at California State University
Local fishermen – Tim Maricich and the crew of the FV *Donna Kathleen*; Ed Ewing, David Wainscott, Gordon Fox and the crew of the FV *South Bay*; Michelle Leary and the crew of the FV *Rita G*; Mark Tognazzini and the crew of the FV *Bonnie Marietta*

Table of Contents

Background

This report summarizes the first year (2010-2011)of the North Central California Coast MPA Baseline ROV Data Collection for Deep Benthic Rock and Soft-Bottom Ecosystem Characterization and Monitoring (20 -116 m). The project is funded by the California Ocean Protection Council (OPC) through University of California Sea Grant, by private donations, and through the in-kind contributions of project partners. This report is submitted to the California Sea Grant as Deliverable X of Task X for Project # XXXX.

The objective of this project is to collect structural and biological community data within four primary geographies that were selected to represent each of the three biogeographic regions identified in the North Central Coast Regional Profile (CMLPAI 2007) and a fourth site requested by proposal reviewers and the MPA Monitoring Enterprise. All are heavily impacted areas expected to show changes related to MPA establishment. They are (listed from north to south) 1): Pt. Arena SMCA and SMR, 2) Bodega Head SMCA and SMR, 3) South Farallon Island SMCA and SMR, and 4) Montara SMR and Pillar Point SMCA (Figure 1). Five treatment sites were selected within each geography for sampling ─ inside and outside the SMR, inside and outside the SMCA, and a site relatively distant from both but of similar depth distribution and bottom habitat composition that will be considered a reference site. Our ultimate aim is characterize seafloor habitats and associated species across representative habitats within each of the geographies at the time of marine protected area implementation.

Participants represent a broad collaborative partnership among non-profits, state and federal agencies, academia, and members of the fishing community, constituents that have not in the past collaborated effectively. The partnership and approach used in this project proved highly efficient resulting in an exceptionally productive and successful field season.

The project was planned as a three year study, including two field seasons using a remotely operated behicle (ROV) to collect imagery used to sample fishes, epifaunal macroinvertebrates and seafloor microhabitats during post-processing. In Project Year 1 we conducted extensive sampling both inside and outside of MPAs, beginning in the south at Montara/Pillar Point, and then worked our way north to South East Farallon Island, Bodega Head, and Pt. Arena. ROV *Beagle*, owned by TNC, operated by MARE was used to collect photographic and videographic imagery, operating from F/V *Donna Kathleen*. Transects completed maximized continuous ROV dive time, encompassing unconsolidated sediment, transitional zones and deep benthic rocky reef habitats.

The goal for year 1 was to complete 2 km transects within each of five separate treatments within each of the geographies chosen. We were successful in collecting at least one kilometer of imagery within all treatments at all geographical sites. Additionally, we collected greater than our goal of 2 km of transect imagery from 16 of the 20 treatment sites. A rapid assessment of Year 1 imagery has been completed and results are included below as is an evaluation of which proposed metrics can reliably be measured with the imagery collected. Detailed frame-by-frame post-processing is now underway.

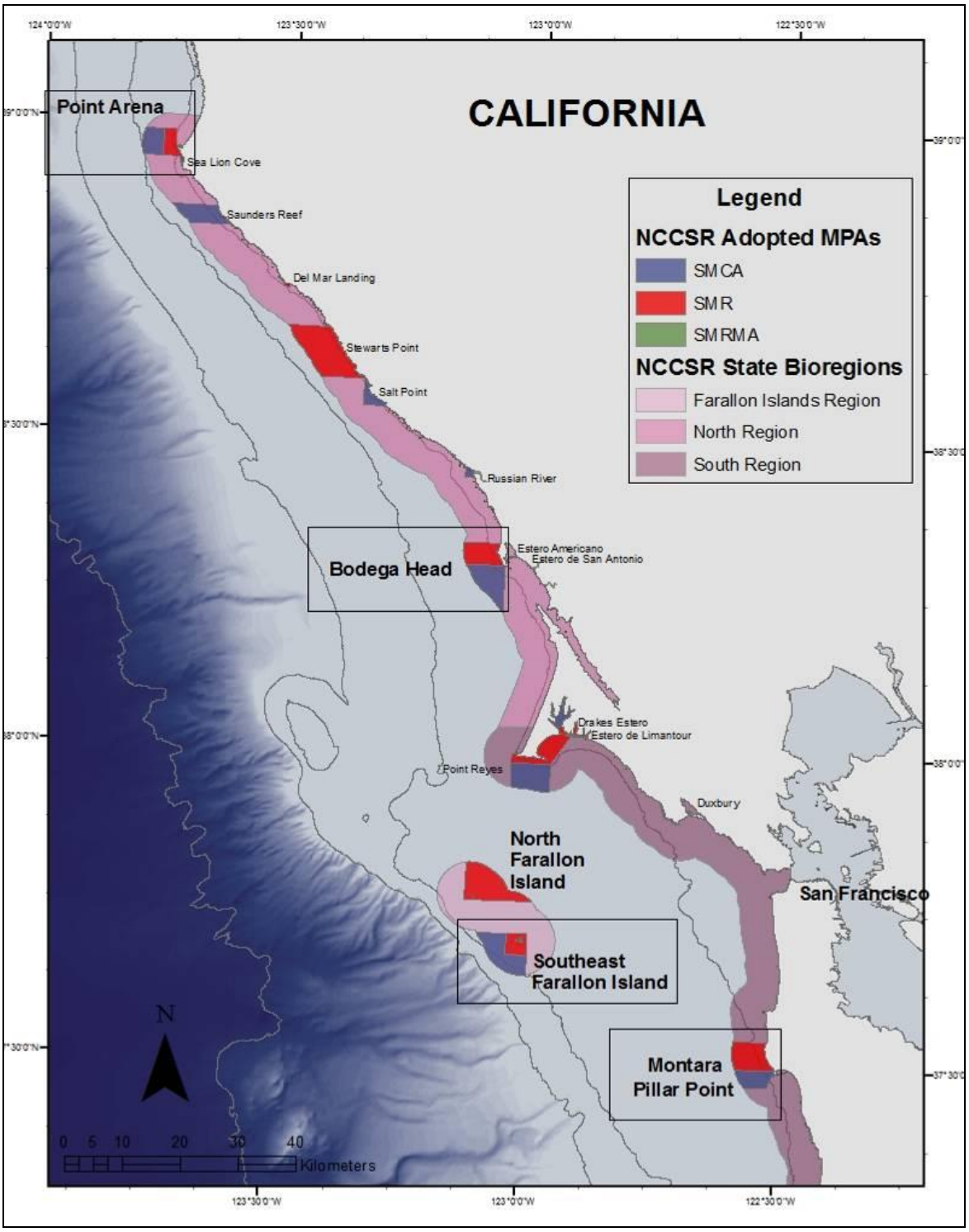


Figure 1: Map of NCC study area including four sites selected for sampling.

Budget Summary

Below is a summary of expenditures for Year 1. Three budget categories exceed the 10% difference from our planned expenditures. The difference in Salaries & Wages (Staff and Faculty) and Fringe Benefits is due to $29,832 in course buyout for James Lindholm that is still pending due to University budget cycles. The difference in Travel is due to a planned poster presentation at the December 2010 California Cooperative Oceanic Fisheries Investigations Conference in San Diego which we were not able to make at the last minute due to discussions among project partners.

		Year 1 Planned 3/1/10 - 2/28/11	Year 1 Actual 3/1/10 - 2/28/11	Year 1 Percent under budget 3/1/10 - 2/28/11
I. SALARIES & WAGES - STAFF & FACULTY 601000				
Total as of 02/28/2011:		**57,147**	28,282	51%
SALARIES & WAGES - STUDENTS 601303				
Total as of 002/28/2011:		**15,120**	14,442	4%
II. FRINGE BENEFITS 603001-603090				
Total as of 02/28/2011:		**10,332**	7,563	27%
III. TRAVEL				
Total as of 02/28/2011:		**2,500**	200	92%
IV. OTHER				
Total as of 02/28/2011:		**13,000**	13,337	-3%
TOTAL DIRECT COST		**98,099**	63,824	
F&A/INDIRECT COST- MTDC (660117)	25.00%	**24,525**	16,660	
TOTAL COSTS:		**122,624**	80,484	

ROV Sampling

The TNC ROV “Beagle” (Figure 2) is configured with two video cameras (forward-oblique and down-looking), a down-looking digital still camera, two down-looking lasers for image calibration, and two forward-looking lasers for estimating size of organisms. The vehicle is also equipped with an altimeter and is “flown” at an altitude of approximately 0.6 – 0.8 m above the seafloor.

Each ROV transect consists of continuous video and digital-still photographs recorded on DVD and digital tape. Each video transect is treated as a series of non-overlapping video frames (or quadrats). The size of a down-looking video frame at a height of 0.75 m from the seafloor is approximately 0.40 m^2. Still photographs are taken at approximately 1-minute intervals along each transect for a minimum of 20 photographs. Each still photograph covers an area of approximately 0.40 m^2. Paired parallel lasers (10-cm spacing) are used to indicate a consistent reference for still photographs (to maintain constancy in area of coverage for each image) and to size individual organisms where desired.

Figure 2: The Vector M4 ROV “Beagle” configured for this project with a forward mount to support a down-looking still and video camera and paired lasers in addition to the existing oblique video camera and lasers.

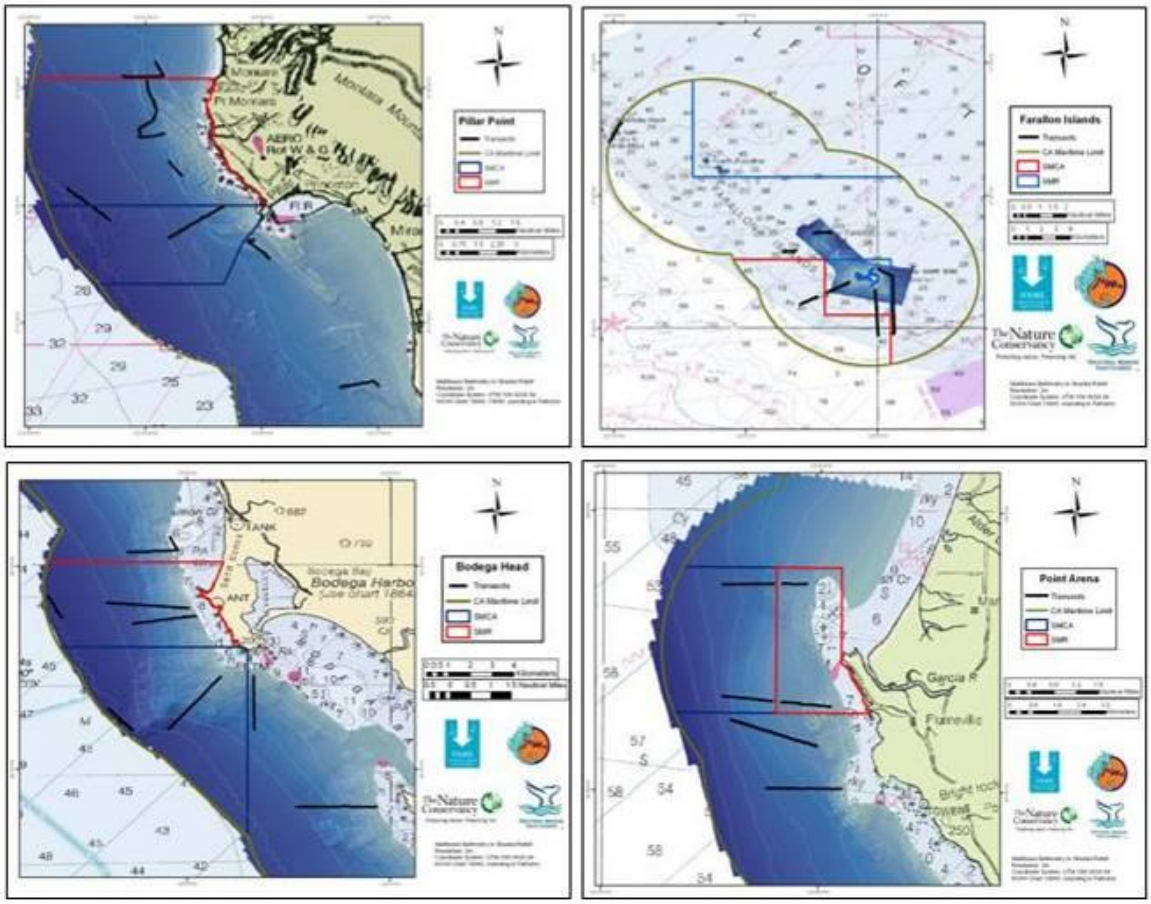


Figure 3: Maps of transects completed within each geographical site surveyed in Year 1.

ROV Operations Log

Imagery Collection Cruise aboard F/V *Donna Kathleen*: 02 - 23 July 2010

This cruise was the first of two cruises planned for the larger study. It represents the first baseline survey through which we will refine the sampling regime and subsequent data collection and analyses from the imagery gathered. A second survey will be conducted in July 2011. The year 1 cruise was conducted from 2-23 July, 2010 aboard the fishing vessel *F/V Donna Kathleen*. A day-by-day breakdown of operations completed is provided in Table 1 below. A summary of ROV sampling effort is provided in Table 2.

Table 2. Summary of daily operations for July 2010.

Date	Operations	Location	Notes
2 July	MOB ROV	Pillar Point Harbor	
3 July	ROV operations	Montara SMR inside	One hour of imagery collection
4 July	ROV operations	Montara SMR In/Out	½ day of imagery collection.
5 July	ROV operations	Pillar Point Ref Site/SMCA In/Out	Full day of imagery collection.
6 July	ROV operations	Montara SMR In/Out, Pillar Point SMCA In/Out	Full day of imagery collection.
7 July	Transit/ROV operations	Transit to Farallon Is., S. Farallon SMR/SMCA In	½ day transit, full day imagery collection.
8 July	ROV operations	Ref site, Farallones SMR/SMCA Out	Full day of imagery collection.
9 July	ROV operations/ transit	Farallones SMR/SMCA In/Out, transit to Pillar Point Harbor	Full day of imagery collection.
10 July	Transit to Bodega Harbor		Boat and personnel relocate to Bodega Bay.
11 July	ROV operations	Bodega Head SMR In	½ day imagery collection.
12 July	ROV operations	Bodega Head SMCA In	½ day imagery collection.
13 July	ROV operations	Bodega Head SMR/SMCA Out	Full day of imagery collection.
14 July	ROV operations	Bodega Head Ref site, SMR/SMCA In	Full day of imagery collection.
15 July	Transit/ROV operations	Transit to Pt Arena, Pt. Arena SMCA/SMR In/Out	Relocated to Pt Arena early, full day of imagery collection.
16 July	ROV operations	Pt Arena SMCA ref site, SMCA/SMR In	Full day of imagery collection.
17 July	Transit/ROV operations	Bodega Head SMR In	Transit to Bodega Bay, ½ day imagery collection.
18-21 July	No operations		Weather prohibited operations.
22 July	Transit/ROV operations	Transit to Pt Reyes SMR	No data collection.
23 July	DEMOB ROV	Pillar Point Harbor	

Table 3: Summary distribution of sampling effort completed in July 2010. Some dives extended into multiple treatment sites.

Geography	Treatment	Dive(s)	Bottom time	Kilometers
Pillar Point	SMR inside	4	4:58	5.1
	SMR outside	1	2:56	2.0
	SMCA inside	2	4:21	4.0
	SMCA outside	1	1:28	1.0
	Reference site	1	1:56	1.4
	TOTAL	*9*	*16:39*	*13.5*
Farallon Islands	SMR inside	3	5:18	4.9
	SMR outside	3	2:52	4.6
	SMCA inside	2	3:29	3.0
	SMCA outside	2	3:00	2.8
	Reference site	1	3:04	1.9
	TOTAL	*11*	*17:43*	*17.2*
Bodega Head	SMR inside	2	4:32	4.1
	SMR outside	1	2:27	2.0
	SMCA inside	2	4:54	4.2
	SMCA outside	1	2:56	2.5
	Reference site	1	3:46	2.9
	TOTAL	*7*	*18:35*	*16.7*
Pt. Arena	SMR inside	2	1:18	3.0
	SMR outside	1	1:27	1.5
	SMCA inside	2	2:14	3.5
	SMCA outside	1	1:26	1.7
	Reference site	1	2:33	2.5
	TOTAL	*7*	*13:01*	*12.0*

Evaluation of Monitoring Metrics

Table 4: Assessment of metrics proposed in the North Central Coast Monitoring Plan and the initial proposal for baseline data collection.

Taxa	Metric	Vital Sign	Monitoring Plan	CDFG NFMP	CDFG	Cordell Bank	NMFS	2010 Post processing: Can we collect statistically?	No obs	Few obs
Deep Rock Ecosystems (30-116 m)										
Community										
Multiple species	Species diversity							yes		
Multiple species	Species richness							yes		
Dominant habitat (50% coverage)	Composition and relief							yes		
Subdominant habitat (20% coverage)	Composition and relief							yes		
Biogenic habitat										
Biogenic habitat composition	Height and complexity							yes		
Microhabitat composition	Relative height and complexity							yes		
Structure-forming	Density and cover		X					yes		
Encrusting Invertebrates	Cover		X					yes		
Sessile Invertebrates										
Metridium spp.	Bed cover		X					yes		X
Hydrocoral	Density		X					yes		
Mobile Invertebrates										
Dungeness crab (*Cancer magister*)	Abundance, density	X	X					yes		
Sheep (spider) crabs (*Loxorhynchus grandis*)	Density		X					no		X
Box crabs (*Lopholithodes foraminatus*)	Density		X					no		X
Fishes										
Bocaccio (*Sebastes paucispinis*)	Density and size structure		X			X	X	no	X	
Yelloweye (*Sebastes ruberrimus*)	Density and size structure		X				X	no	X	
Vermilion (*Sebastes miniatus*)	Density and size structure		X	X	X	X		no		X
Lingcod (*Ophiodon elongatus*)	Density and size structure	X	X		X			maybe		
Dwarf rockfish: Halfbanded (*S. semicinctus*), pygmy (*S. wilsoni*), etc.	Total abundance	X	X			X	X	maybe		
Gopher rockfish (*Sebastes carnatus*)	Density and size structure		X	X	X			no		X
China rockfish (*Sebastes nebulosus*)	Density and size structure		X	X	X			maybe		
Ratfish (*Hydrolagus colliei*)	Density and size structure					X		no		X
Rosy rockfish (Sebastes rosaceus)	Density and size structure					X		maybe		
Black rockfish (*Sebastes melanops*)	Abundance and freq. of occurrence			X	X		X	maybe		

Taxa	Metric	Vital Sign	Monitoring Plan	CDFG NFMP	CDFG	Cordell Bank	NMFS	Can we collect statistically?	No obs	Few obs
Blue rockfish (*Sebastes mystinus*)	Abundance and freq. of occurrence			X	X		X	maybe		
Brown rockfish (*S. auriculatus*)	Abundance and size structure			X	X			no		X
Cabezon (*Scorpaenichthys marmoratus*)	Abundance and size structure			X	X			no		X
Copper rockfish (*S. caurinus*)	Abundance and size structure			X	X			no		X
Kelp greenling (*Hexagrammos decagrammus*)	Abundance and size structure			X	X			yes		
Calico rockfish - Sebastes dallii	Abundance and size structure			X				no	X	
Grass rockfish - Sebastes rastrelliger	Abundance and size structure		X	X				no	X	
Olive rockfish - Sebastes serranoides	Abundance and size structure		X	X				no		X
Quillback rockfish - Sebastes maliger	Abundance and size structure		X	X				yes		
Treefish – Sebastes serriceps	Abundance and size structure		X	X				no	X	
Rock greenling - Hexagrammos lagocephalus	Abundance and size structure		X	X						X
Soft-bottom (20-116 m)										
Community										
Multiple species	Species diversity							yes		
Multiple species	Species richness							yes		
Dominant habitat (50% coverage)	Composition and relief							yes		
Subdominant habitat (20% coverage)	Composition and relief							yes		
Biogenic habitat										
Multiple species	Total cover and diversity		X					yes		
Biogenic mounds and depressions	Density and relative abundance							yes		
Biogenic habitat composition	Height and complexity							yes		
Microhabitat composition	Relative height and complexity							yes		
Benthic invertebrate predators										
Dungeness crab (*Cancer magister*)	Density and size structure	X	X					yes		
Box crabs (*Lopholithodes foraminatus*)	Density and size structure							no	X	
Sea star (multiple species: *Rathbunaster/ Pycnopodia/Luidia/Stylasterias/Mediaster etc.*)	Abundance and size structure	X	X					yes		
Demersal fish predators										
California halibut (*Paralichthys californicus*)	Density and size structure	X	X					no	X	
Starry flounder (*Platichthys stellatus*)	Density and size structure	X	X					no		X
Pacific sanddab (*Citharichthys sordidus*)	Density and size structure		X		X			yes		
Other flatfish	Density and size structure	X						yes		
Lingcod (*Ophiodon elongatus*)	Density and size structure				X			yes		X

Rapid Assessment

Initial site and imagery evaluations were completed using a semi-quantitative rapid assessment technique developed specifically for this project. The technique involves reviewing the down-video records and recording gross habitat and organismal metrics frame-by-frame during the first 20 seconds of each minute using an event logging board known as x-keys. The resulting TDAP (Taxonomic Distribution and Abundance Plot) graphs illustrate frequency distributions for each metric across habitat characteristics. These data will allow a first look at taxa distribution and frequency of occurrence prior to detailed data collection and analyses. Table 5 includes definition of each metric recorded during the rapid assessment and Figures X – X are examples of TDAPs from each site at which the data were collected.

Table 5. Rapid assessment metric definitions.

TDAP (X-Key) Metric Definitions

Habitat

Continuous rock **-** Outcropping or bed of solid rock
Rock Large - Loose rock greater than 20 cm diameter
Rock Small - Loose rock less than 20 cm
Sand - Fine and/or coarse unconsolidated sediment

Relief

High - >2 meter vertical relief
Moderate - 1-2 meter vertical relief
Low - >0 -1m vertical relief
Flat – No relief
Crested - Sand waves and/or ripples with defined crests with consistent pattern
Degraded crest - Sand waves and/or ripples with rounded or degraded crests

Biogenic

Bio low - Biogenic (sessile, structure-forming invertebrate) less than 10 cm
Bio high - Biogenic (sessile, structure-forming invertebrate) greater than 10 cm
Mounds/Depressions-representation of bioturbation level
Mound/Depress small - Mound/Depression where diameter at the widest point is less than 10 cm
Mound/Depress large - Mound/Depression where diameter at the widest point is greater than 10 cm
Single hole small – Distinct hole in the sediment with rounded edges where the diameter is less than 10 cm.
Single hole large - Distinct hole in the sediment with rounded edges where the diameter is greater than 10 cm.
Multiple small holes – Distinct hole in the sediment with rounded edges where the diameter is less than 10 cm.
Multiple large holes - Distinct hole in the sediment with rounded edges where the diameter is greater than 10 cm.

Mobile organisms

Single fin - Any solitary finfish NOT in contact with the seafloor
Group fin - Group of 2-10 finfish NOT in contact with the seafloor
Aggregation fin - Group of 10+ finfish NOT in contact with the seafloor
Single fin ON - Any solitary finfish in physical contact with the seafloor

Group fin ON - Group of 2-10 finfish in physical contact with the seafloor
Aggregation fin ON - Group of 10+ finfish in physical contact with the seafloor
Single flat - Any solitary flatfish
Group flat - Group of 2-10 flatfish
Aggregation of flat – Group of 10+ flatfish

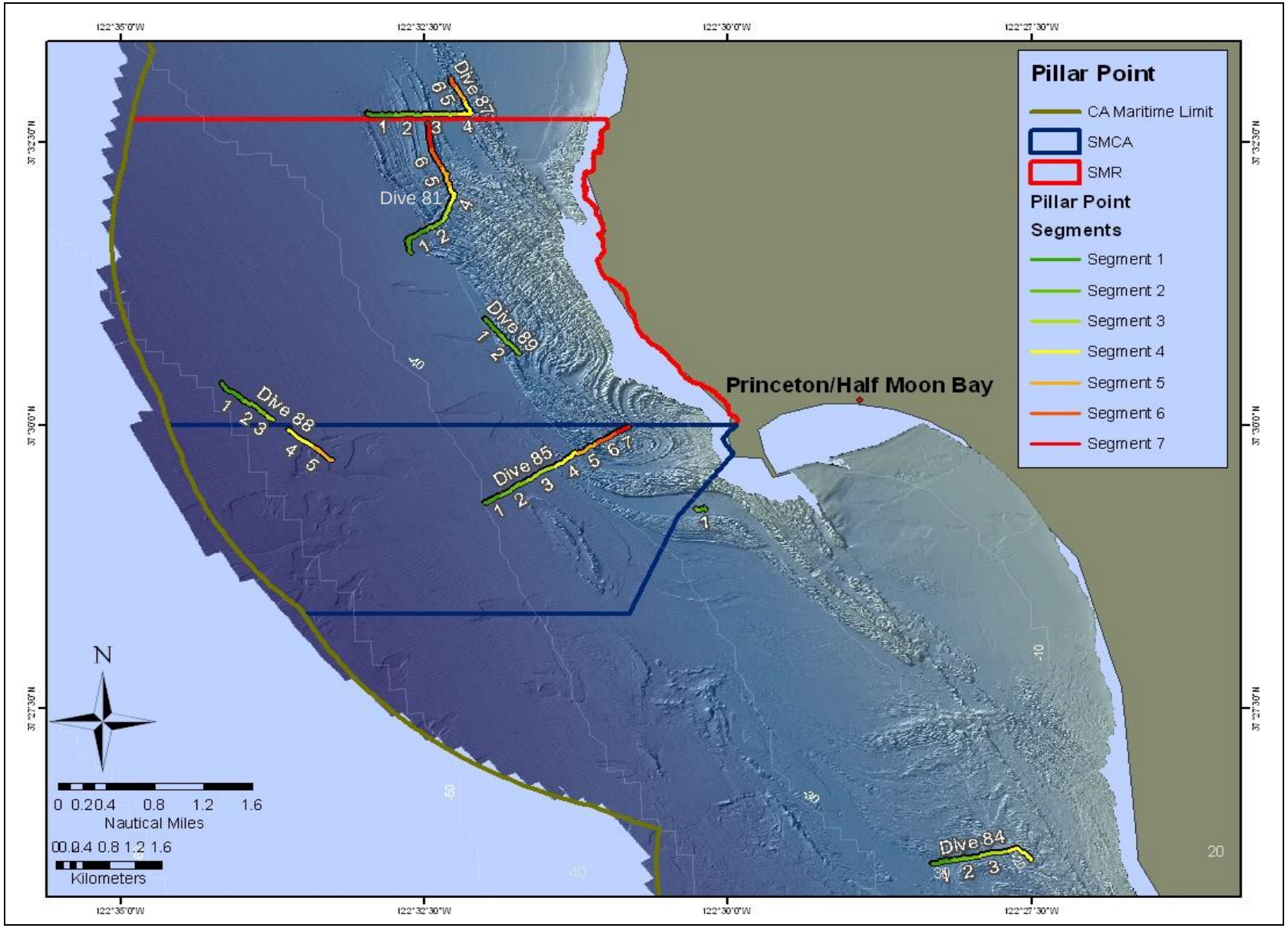


Figure 4: Pillar Point SMCA and Montara SMR Operating Area

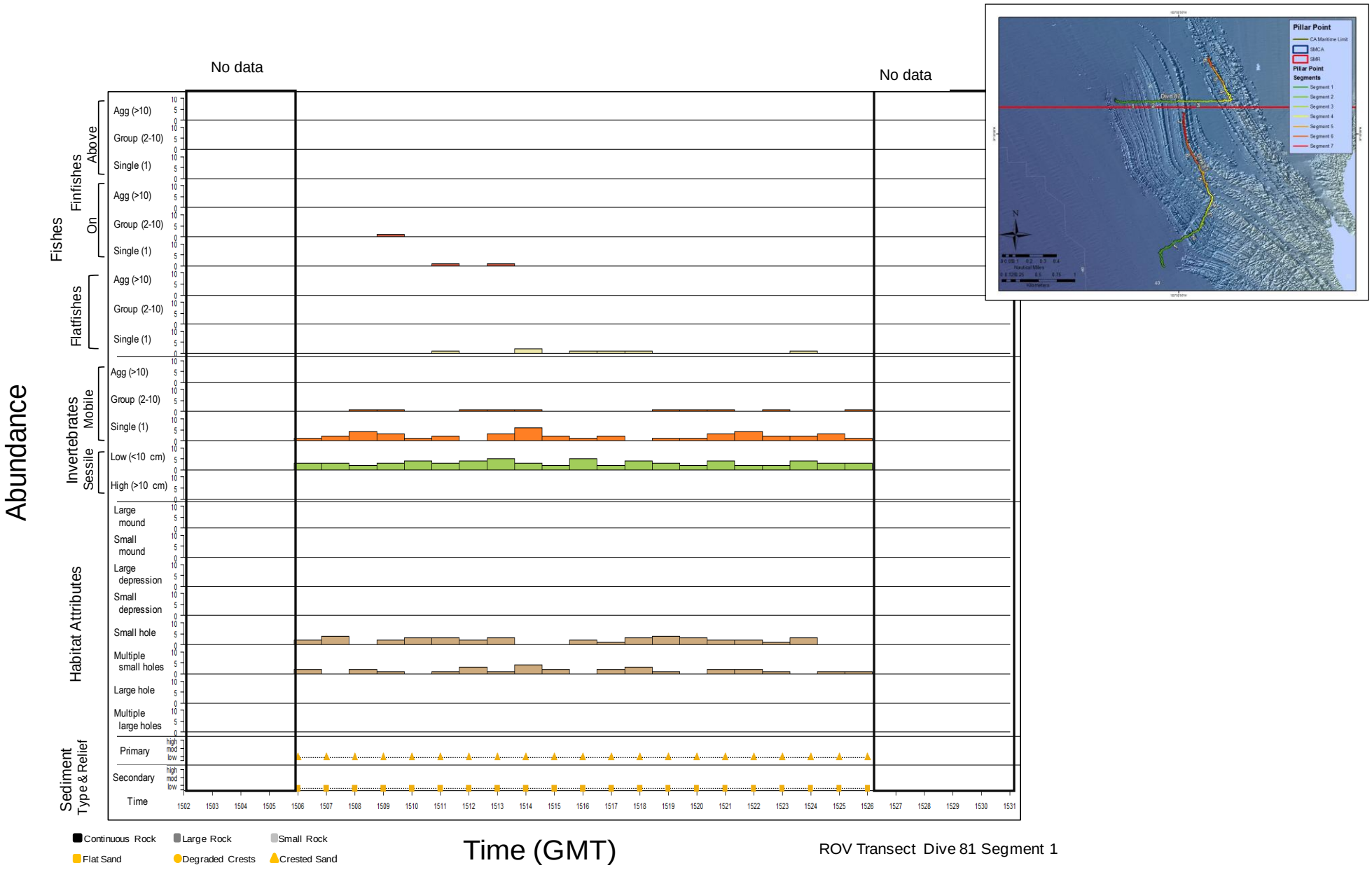

No data
No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1502 1503 1504 1505 1506 1507 1508 1509 1510 1511 1512 1513 1514 1515 1516 1517 1518 1519 1520 1521 1522 1523 1524 1525 1526 1527 1528 1529 1530 1531
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 81 Segment 1
Pillar Point
Pillar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7

Figure 5

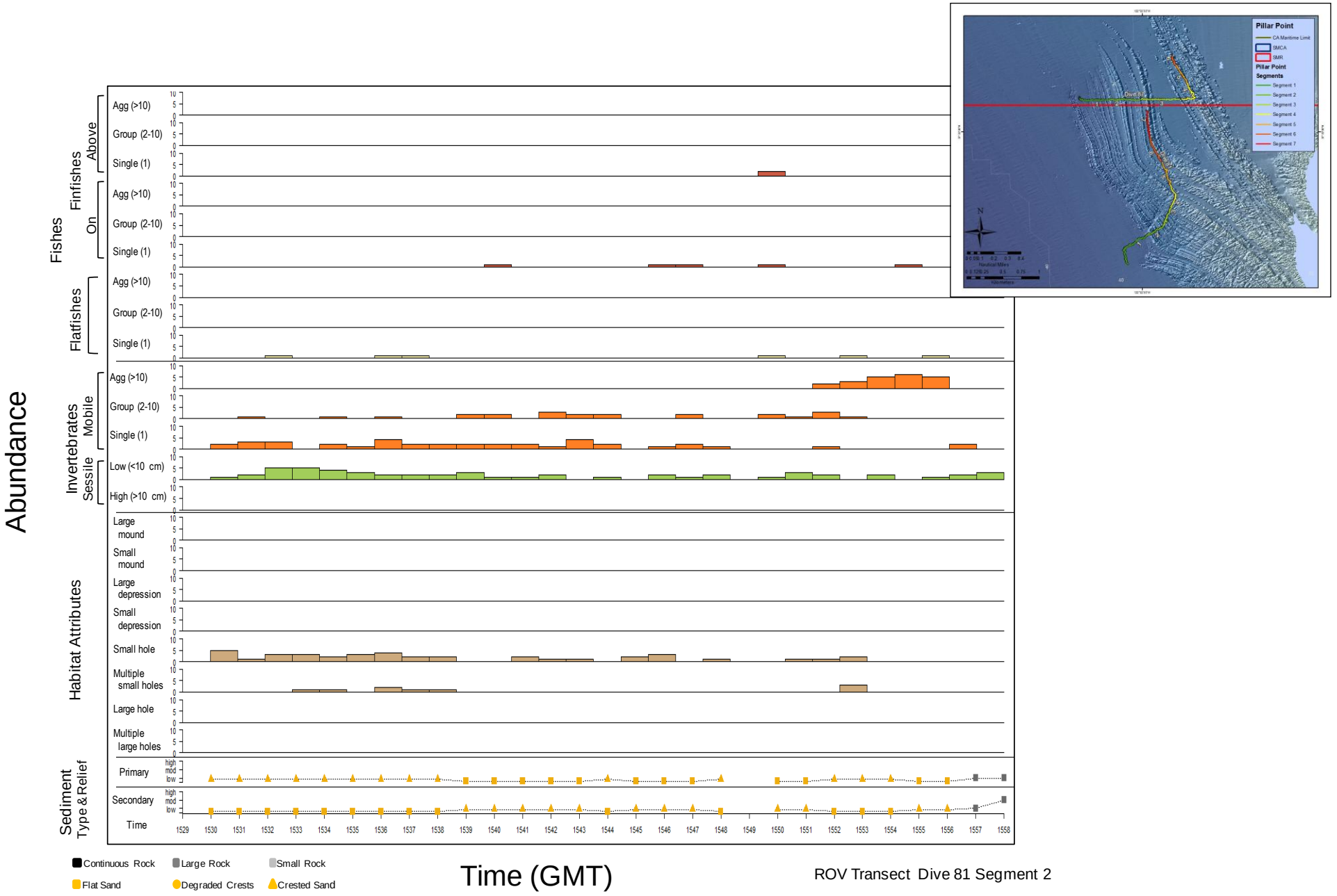
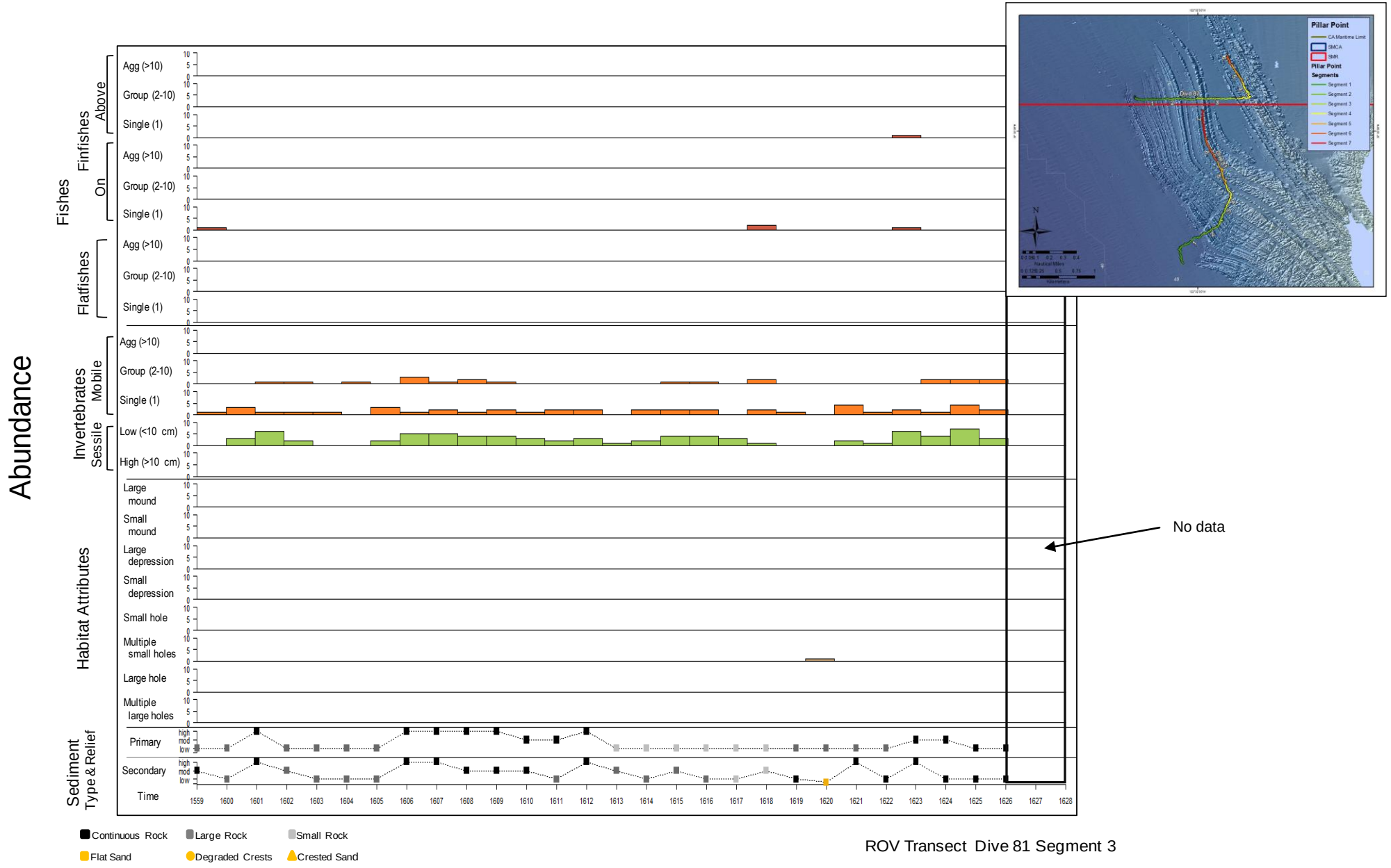

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1529 1530 1531 1532 1533 1534 1535 1536 1537 1538 1539 1540 1541 1542 1543 1544 1545 1546 1547 1548 1549 1550 1551 1552 1553 1554 1555 1556 1557 1558
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 81 Segment 2
Pillar Point
CA Maritime Limit
SMCA
SMR
Pillar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Dive 81
N

Figure 6



ROV Transect Dive 81 Segment 3

Figure 7

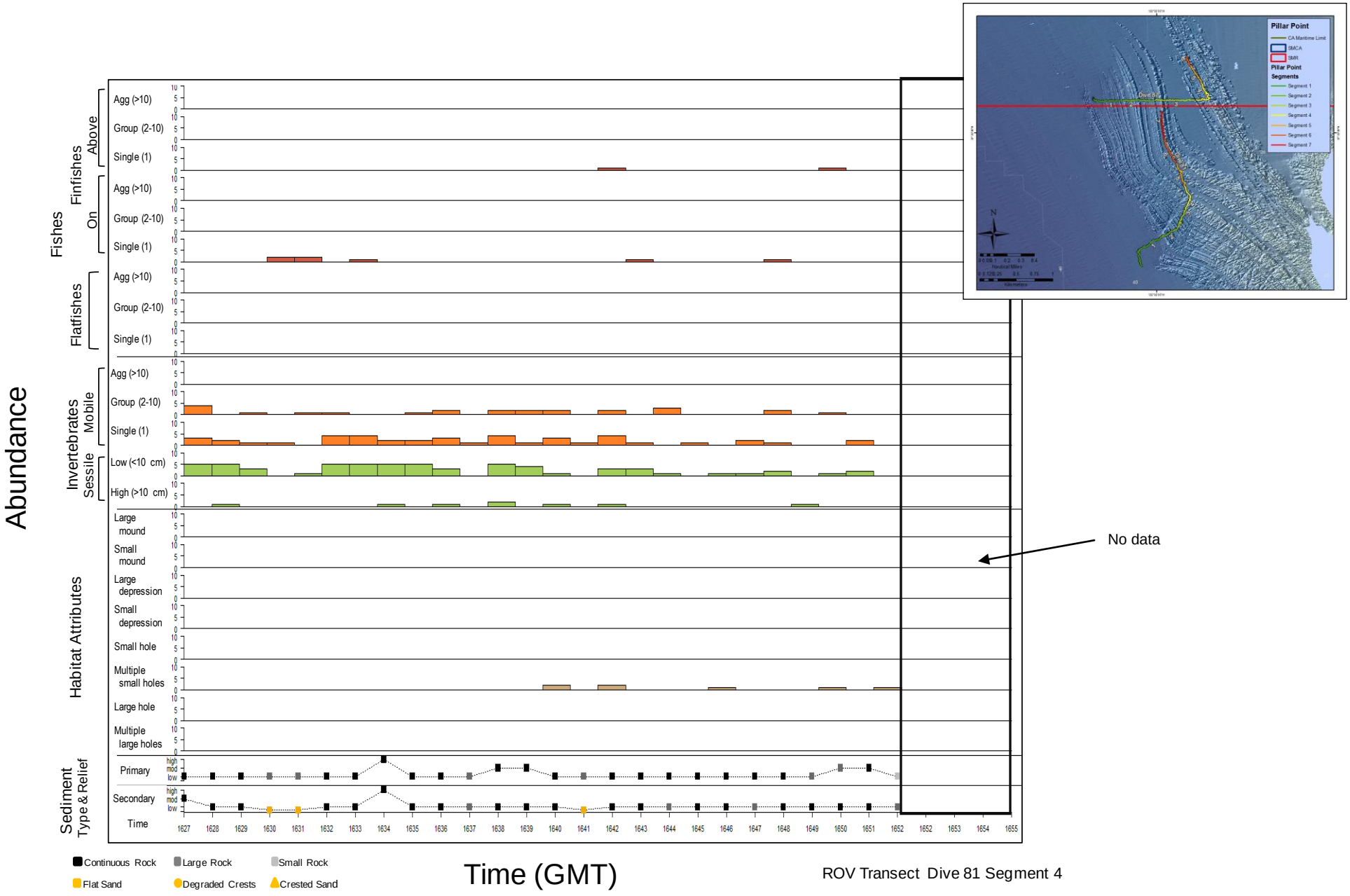

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1627 1628 1629 1630 1631 1632 1633 1634 1635 1636 1637 1638 1639 1640 1641 1642 1643 1644 1645 1646 1647 1648 1649 1650 1651 1652 1652 1653 1654 1655
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
No data
Pillar Point
CA Maritime Limit
SMCA
SMR
Pillar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
ROV Transect Dive 81 Segment 4

Figure 8

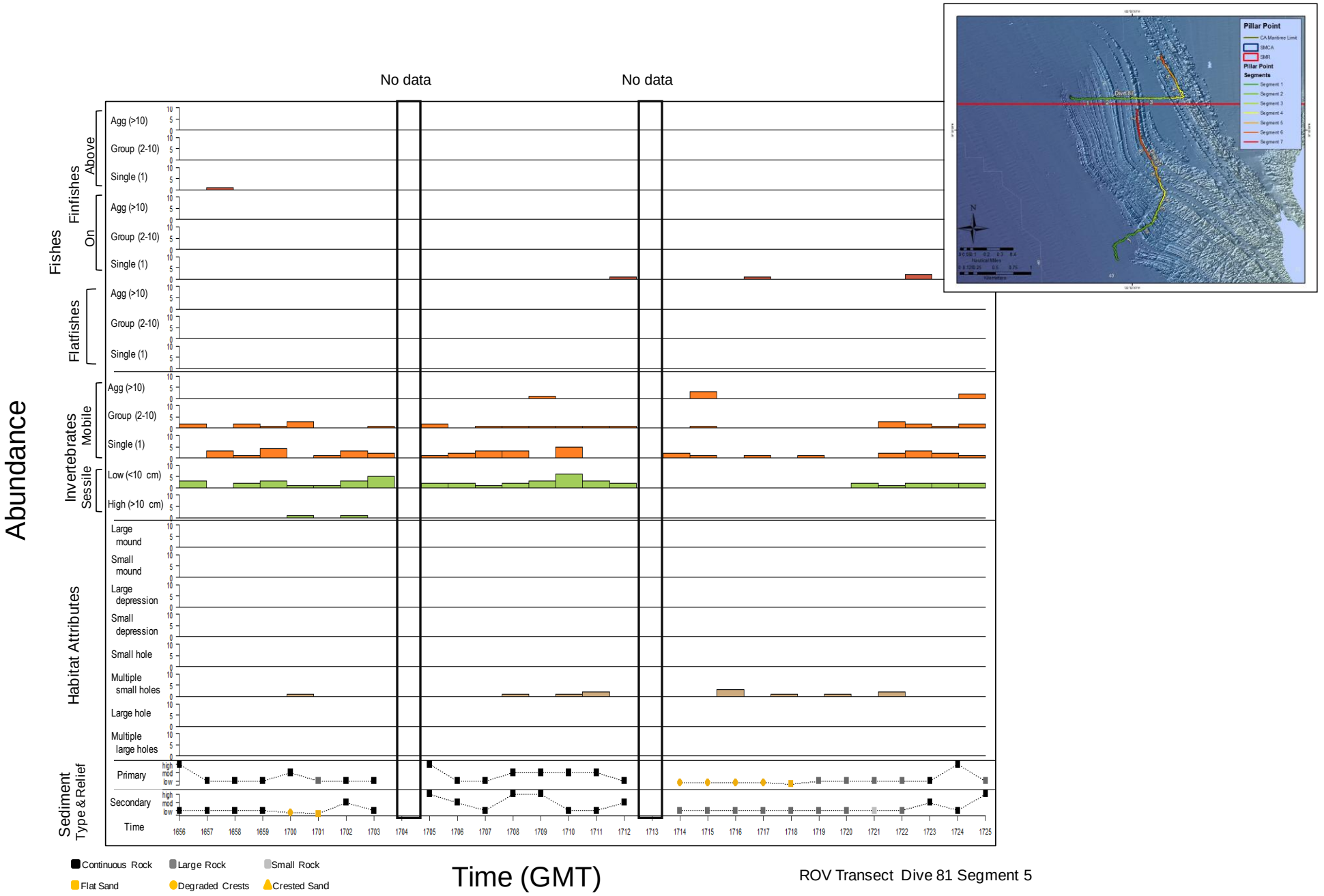

No data
No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
1656 1657 1658 1659 1700 1701 1702 1703 1704 1705 1706 1707 1708 1709 1710 1711 1712 1713 1714 1715 1716 1717 1718 1719 1720 1721 1722 1723 1724 1725
Pillar Point
CA Maritime Limit
SMCA
SMR
Pillar Point Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 81 Segment 5

Figure 9

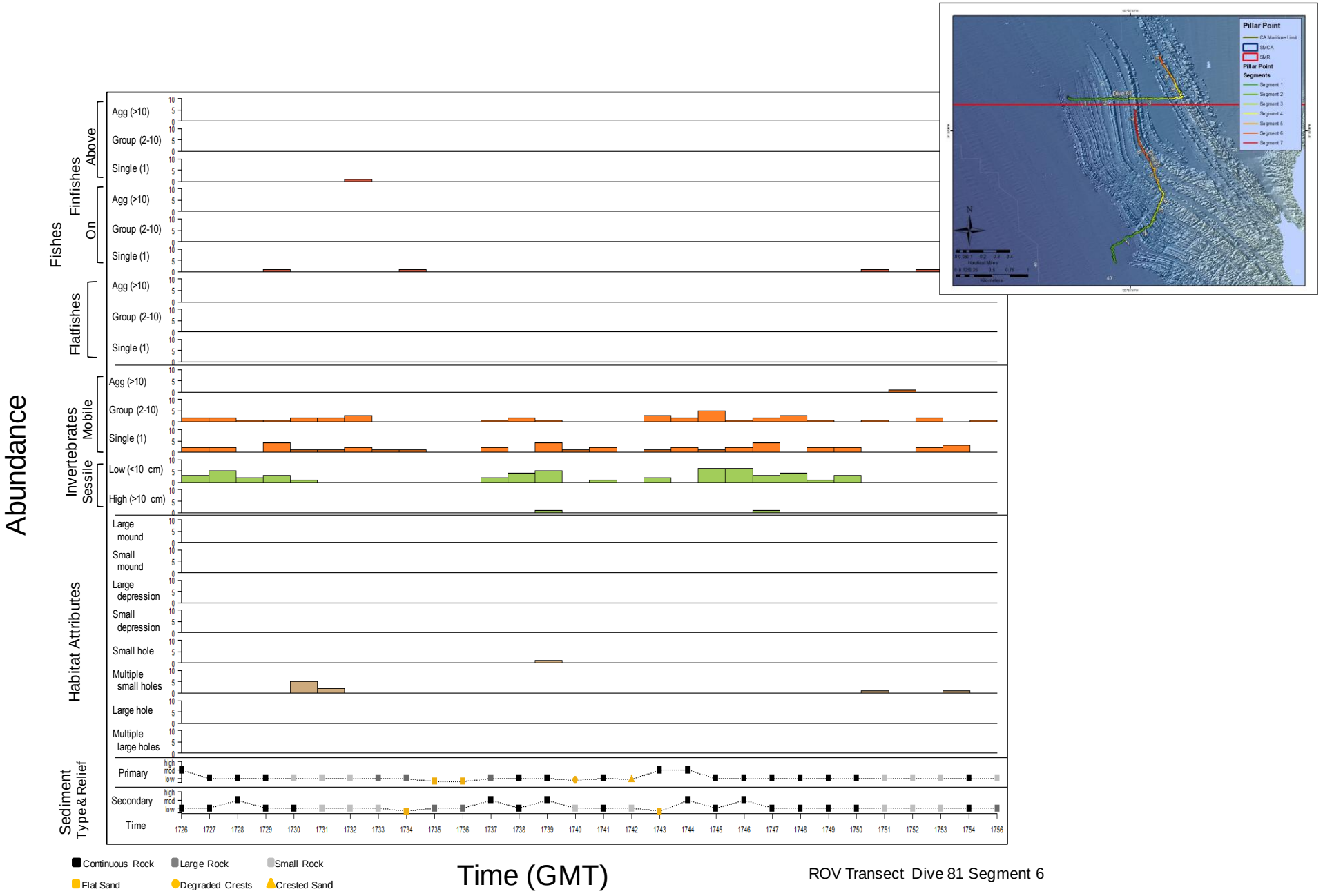

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
1726 1727 1728 1729 1730 1731 1732 1733 1734 1735 1736 1737 1738 1739 1740 1741 1742 1743 1744 1745 1746 1747 1748 1749 1750 1751 1752 1753 1754 1756
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 81 Segment 6
Pillar Point
CA Maritime Limit
SMCA
SMR
Pillar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Dive 81
N

Figure 10

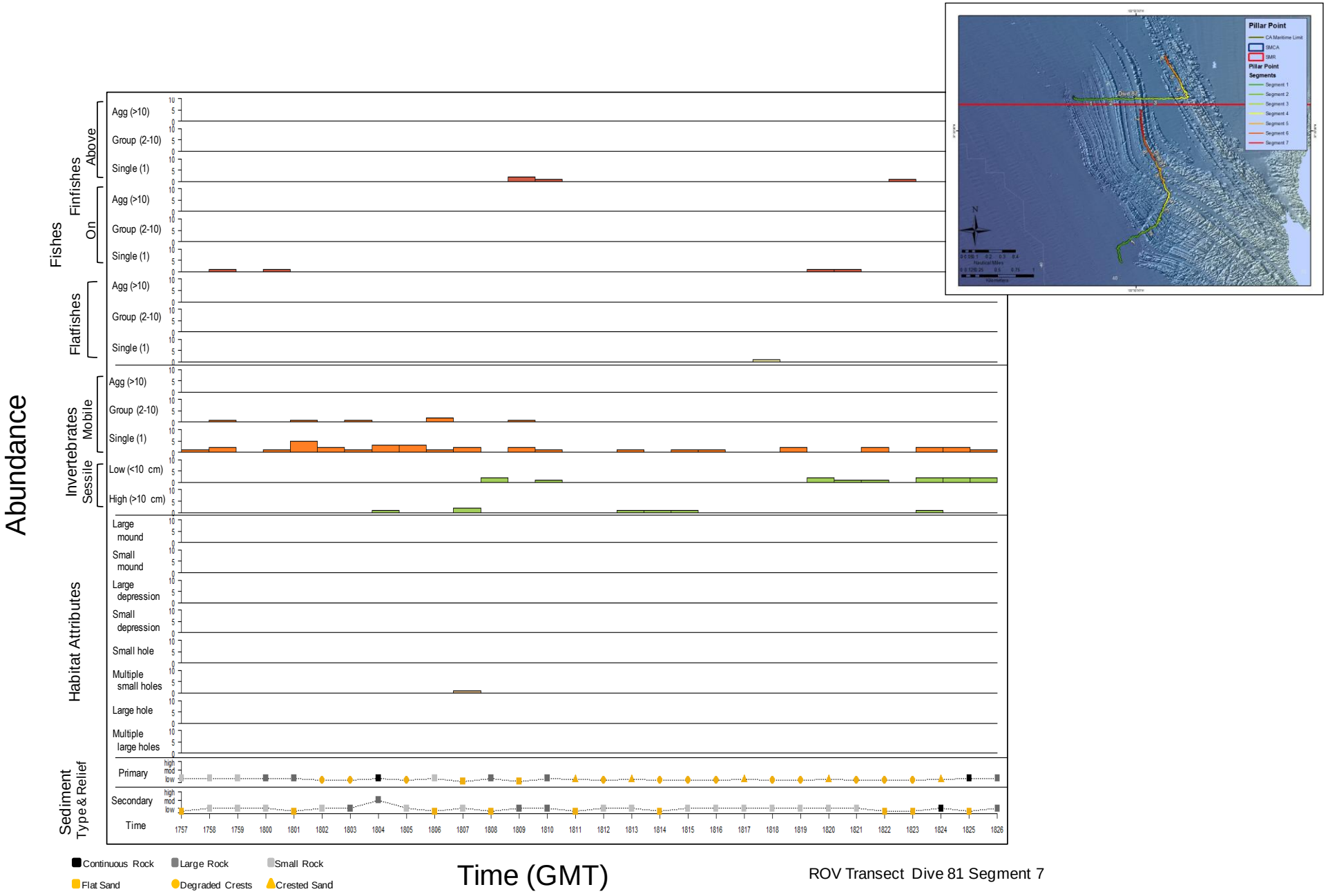

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1757 1758 1759 1800 1801 1802 1803 1804 1805 1806 1807 1808 1809 1810 1811 1812 1813 1814 1815 1816 1817 1818 1819 1820 1821 1822 1823 1824 1825 1826
Pillar Point
CA Maritime Limit
SMCA
SMR
Pillar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Dive 81
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 81 Segment 7

Figure 11

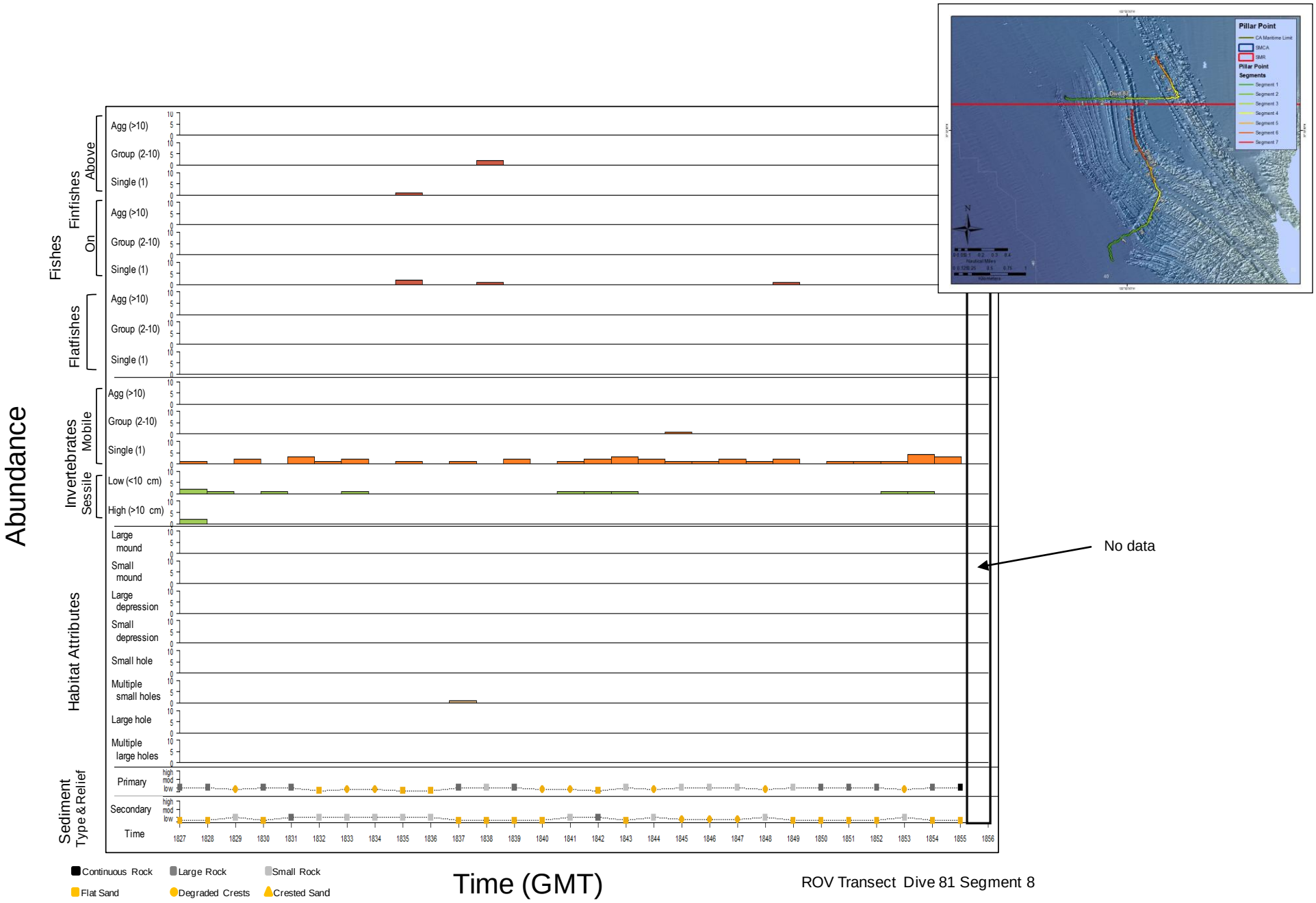

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1843 1844 1845 1846 1847 1848 1849 1850 1851 1852 1853 1854 1855 1856
Pilar Point
CA Maritime Limit
SMCA
SMR
Pilar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
No data
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 81 Segment 8

Figure 12

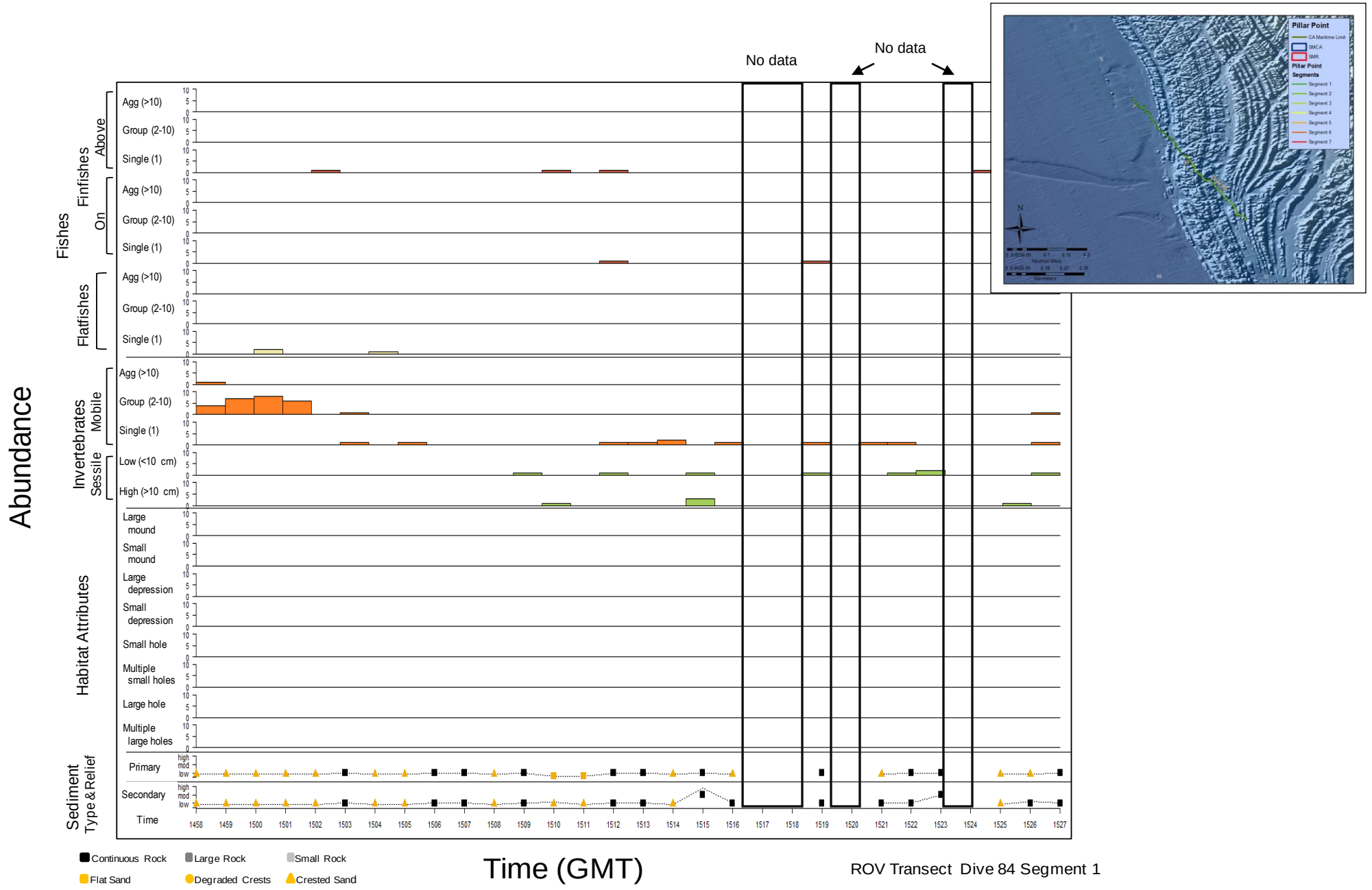

No data
No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1458 1459 1500 1501 1502 1503 1504 1505 1506 1507 1508 1509 1510 1511 1512 1513 1514 1515 1516 1517 1518 1519 1520 1521 1522 1523 1524 1525 1526 1527
Pillar Point
CA Maritime Limit
SMCA
SMR
Pillar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 84 Segment 1

Figure 13

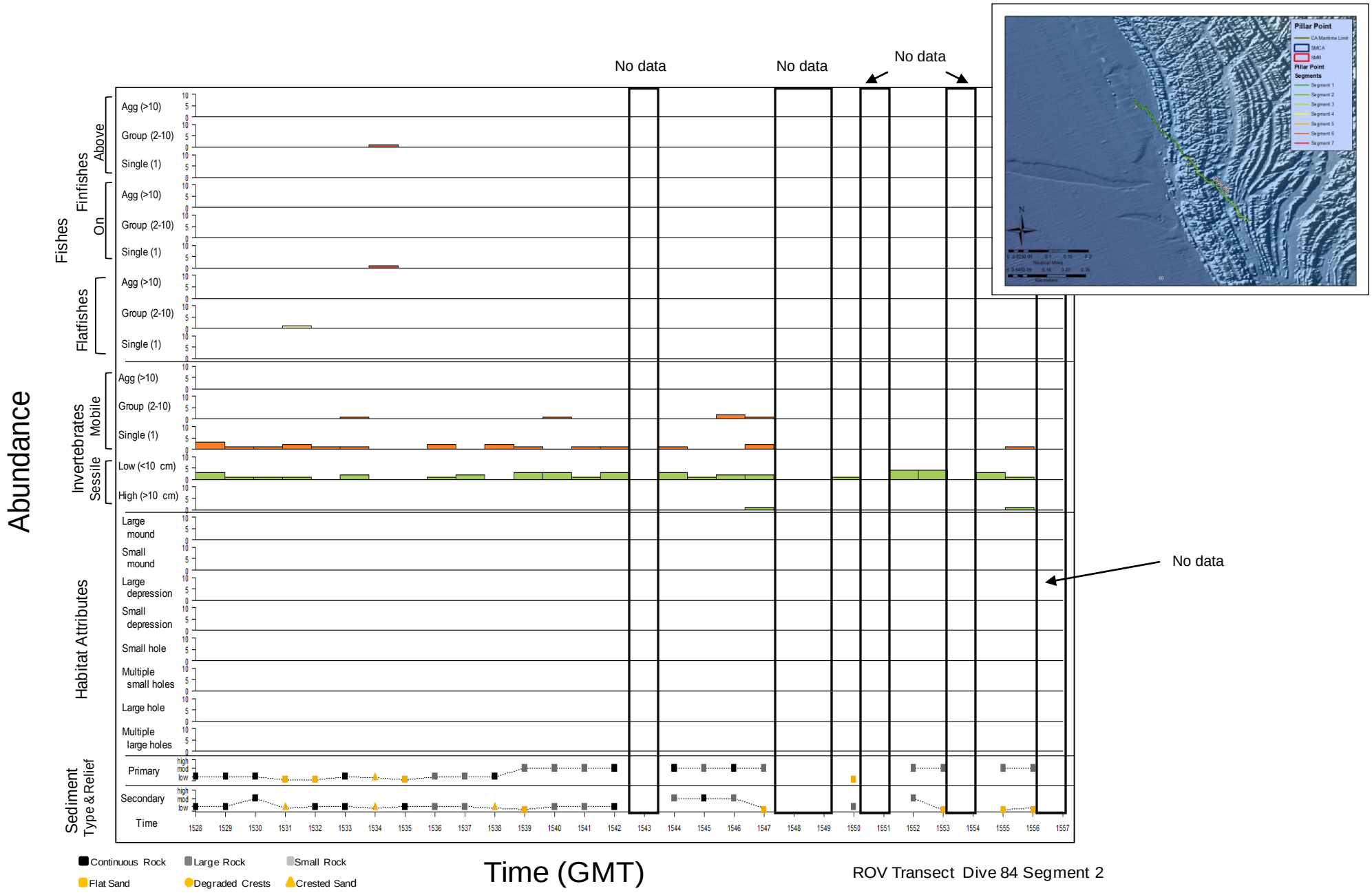

No data
No data
No data
No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1528 1529 1530 1531 1532 1533 1534 1535 1536 1537 1538 1539 1540 1541 1542 1543 1544 1545 1546 1547 1548 1549 1550 1551 1552 1553 1554 1555 1556 1557
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 84 Segment 2
Pillar Point
CA Maritime Limit
SMCA
SMR
Pillar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7

Figure 14

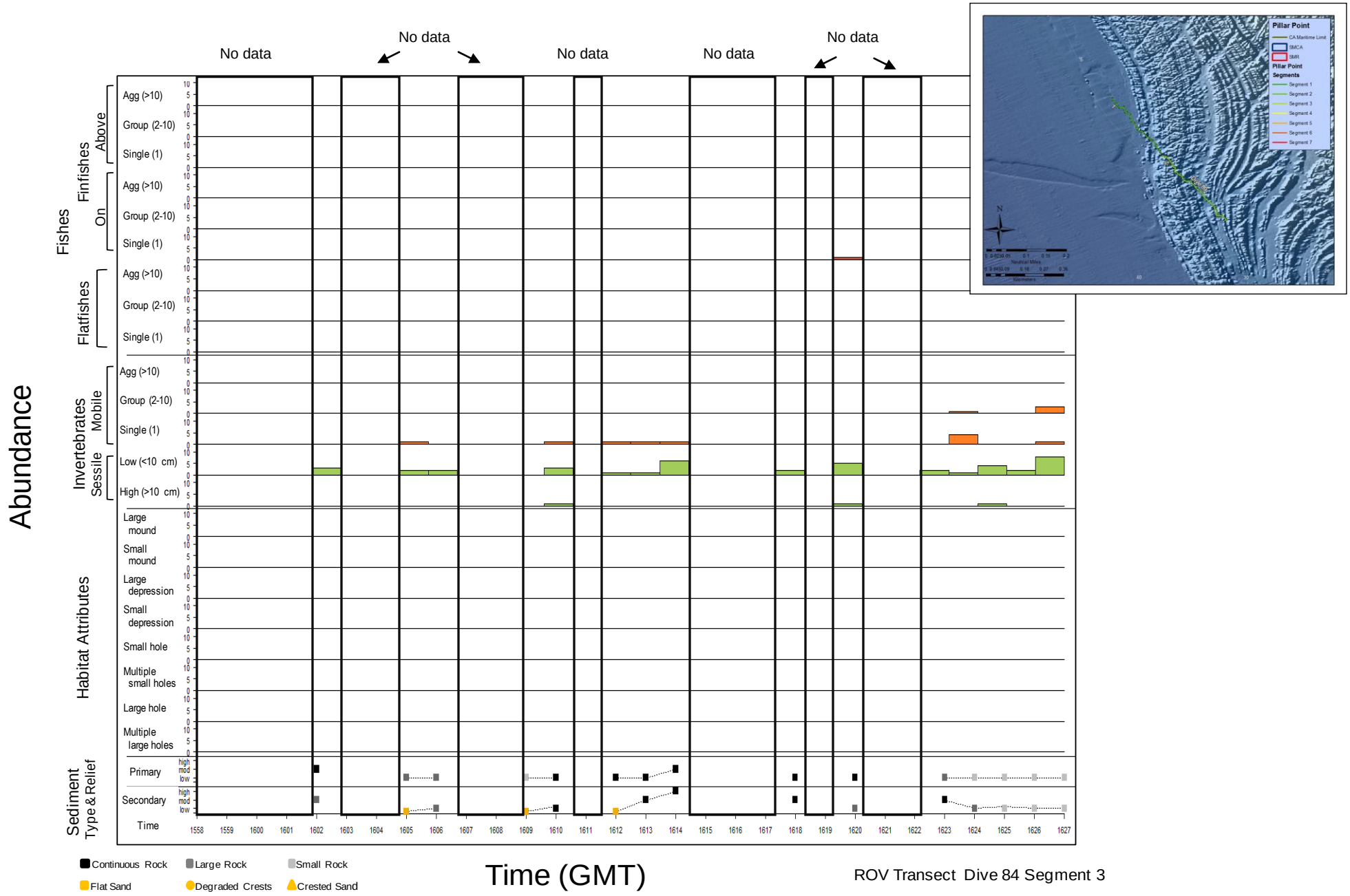

No data
No data
No data
No data
No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1558 1559 1600 1601 1602 1603 1604 1605 1606 1607 1608 1609 1610 1611 1612 1613 1614 1615 1616 1617 1618 1619 1620 1621 1622 1623 1624 1625 1626 1627
Pillar Point
CA Maritime Limit
SMCA
SMR
Pillar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 84 Segment 3

Figure 15

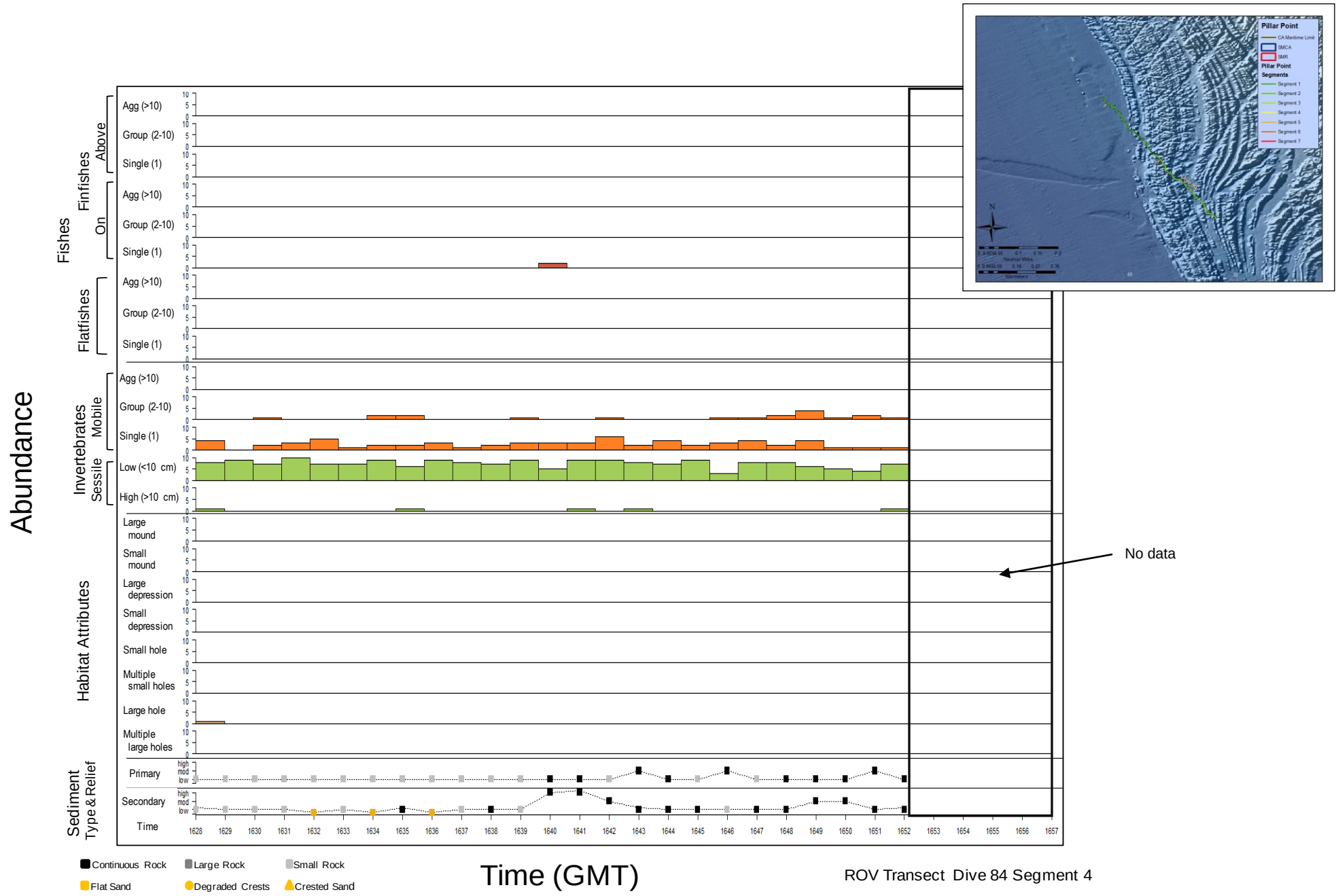

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1628 1629 1630 1631 1632 1633 1634 1635 1636 1637 1638 1639 1640 1641 1642 1643 1644 1645 1646 1647 1648 1649 1650 1651 1652 1653 1654 1655 1656 1657
Pillar Point
CA Maritime Limit
SMCA
SMR
Pillar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
N
No data
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 84 Segment 4

Figure 16

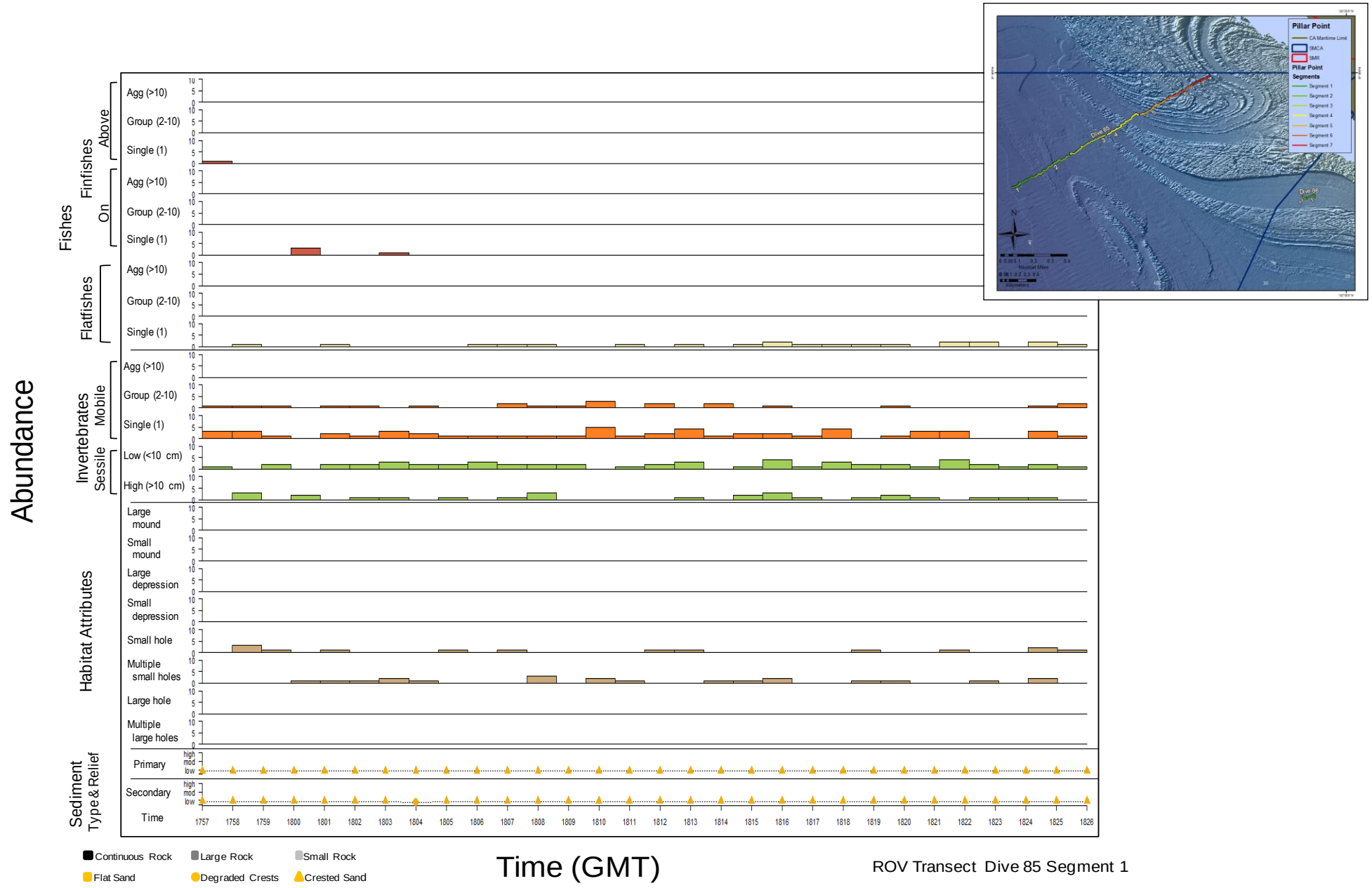

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1757 1758 1759 1800 1801 1802 1803 1804 1805 1806 1807 1808 1809 1810 1811 1812 1813 1814 1815 1816 1817 1818 1819 1820 1821 1822 1823 1824 1825 1826
Pillar Point
CA Maritime Limit
SMCA
SMR
Pillar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Dive 85
Dive 86
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 85 Segment 1

Figure 17

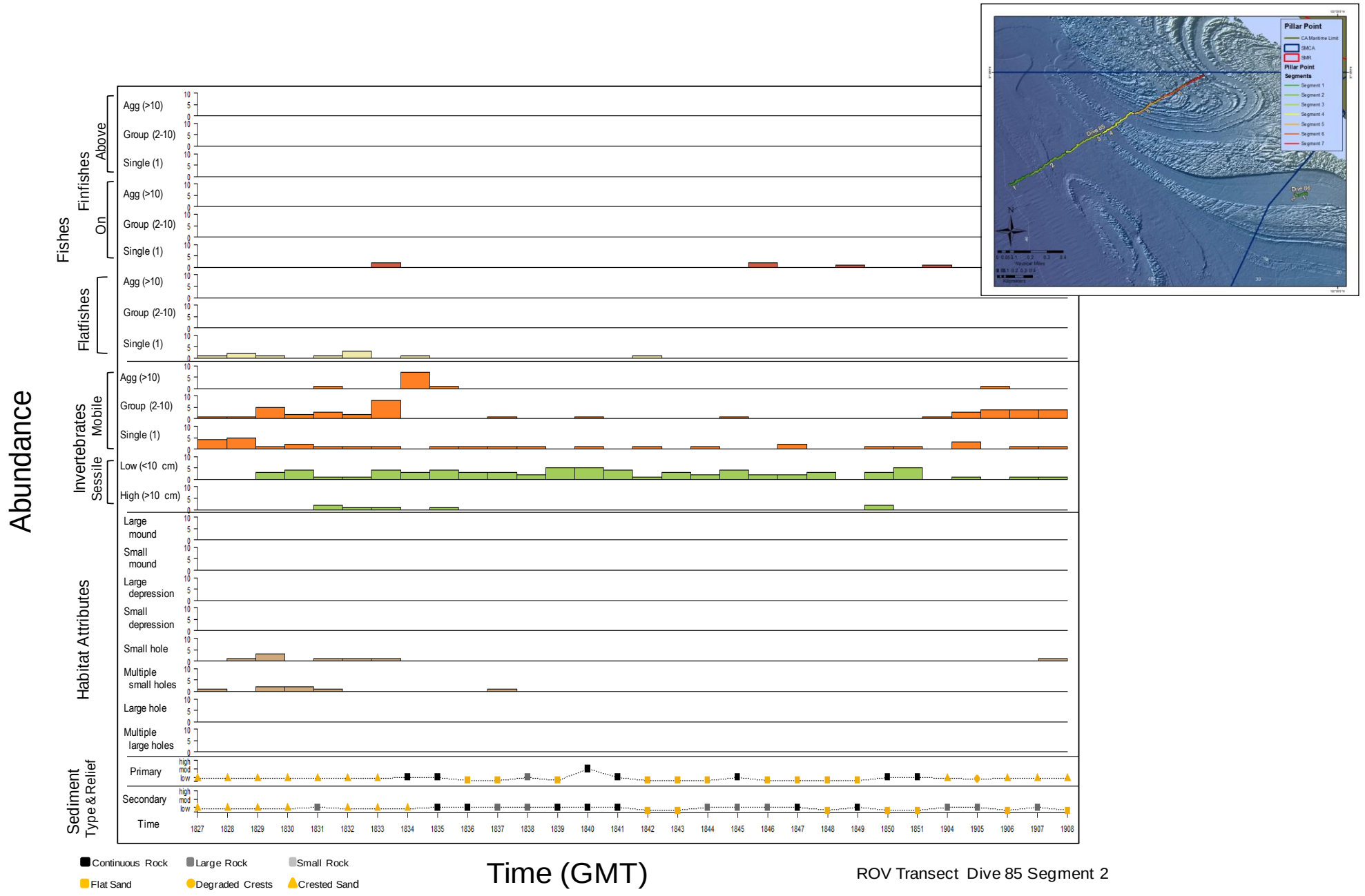

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1843 1844 1845 1846 1847 1848 1849 1850 1851 1904 1905 1906 1907 1908
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 85 Segment 2
Pillar Point
CA Maritime Limit
SMCA
SMR
Pillar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Dive 85
Dive 86

Figure 18

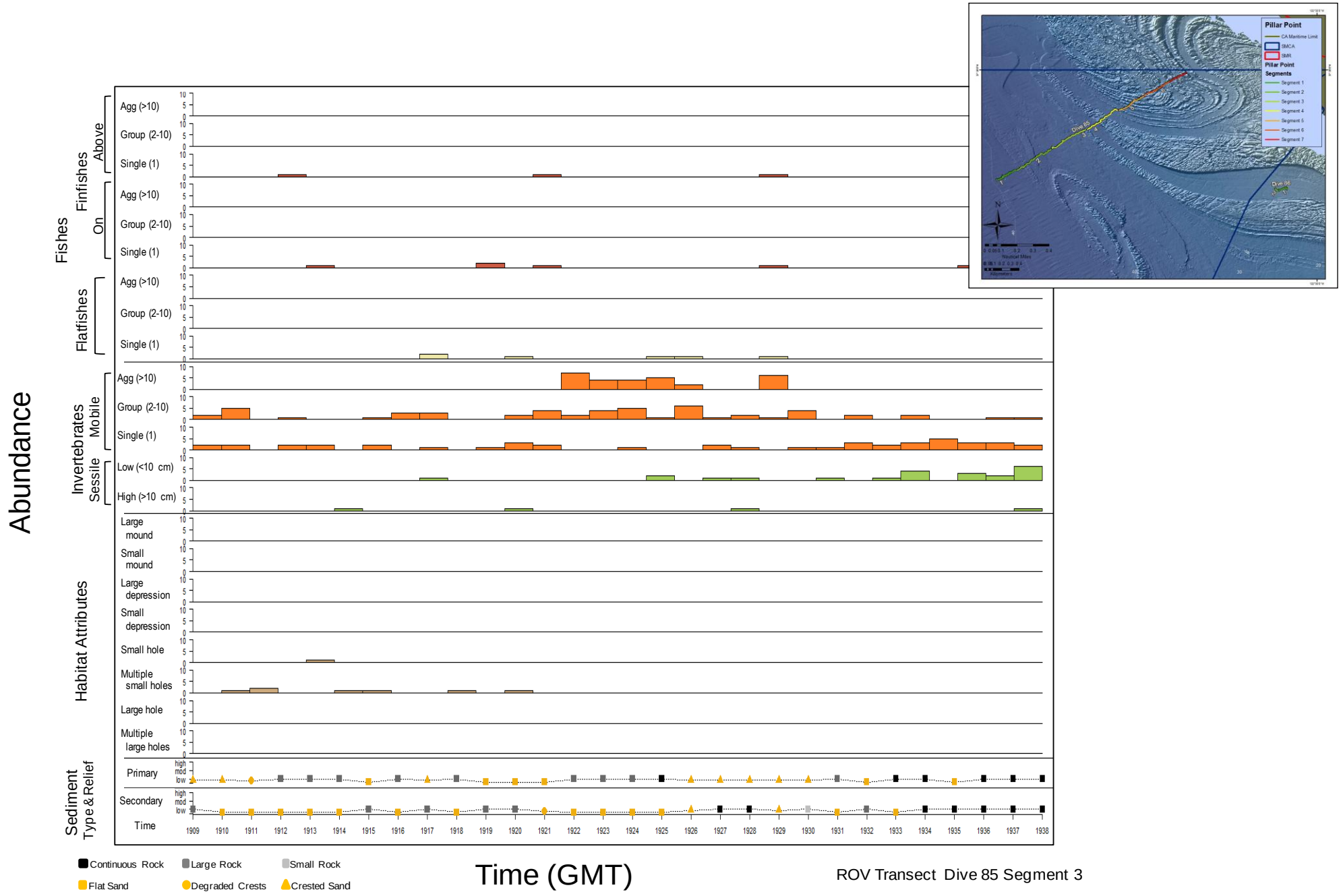

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1909
1910
1911
1912
1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
1924
1925
1926
1927
1928
1929
1930
1931
1932
1933
1934
1935
1936
1937
1938
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
Pillar Point
CA Maritime Limit
SMCA
SMR
Pillar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Dive 85
Dive 86
ROV Transect Dive 85 Segment 3

Figure 19

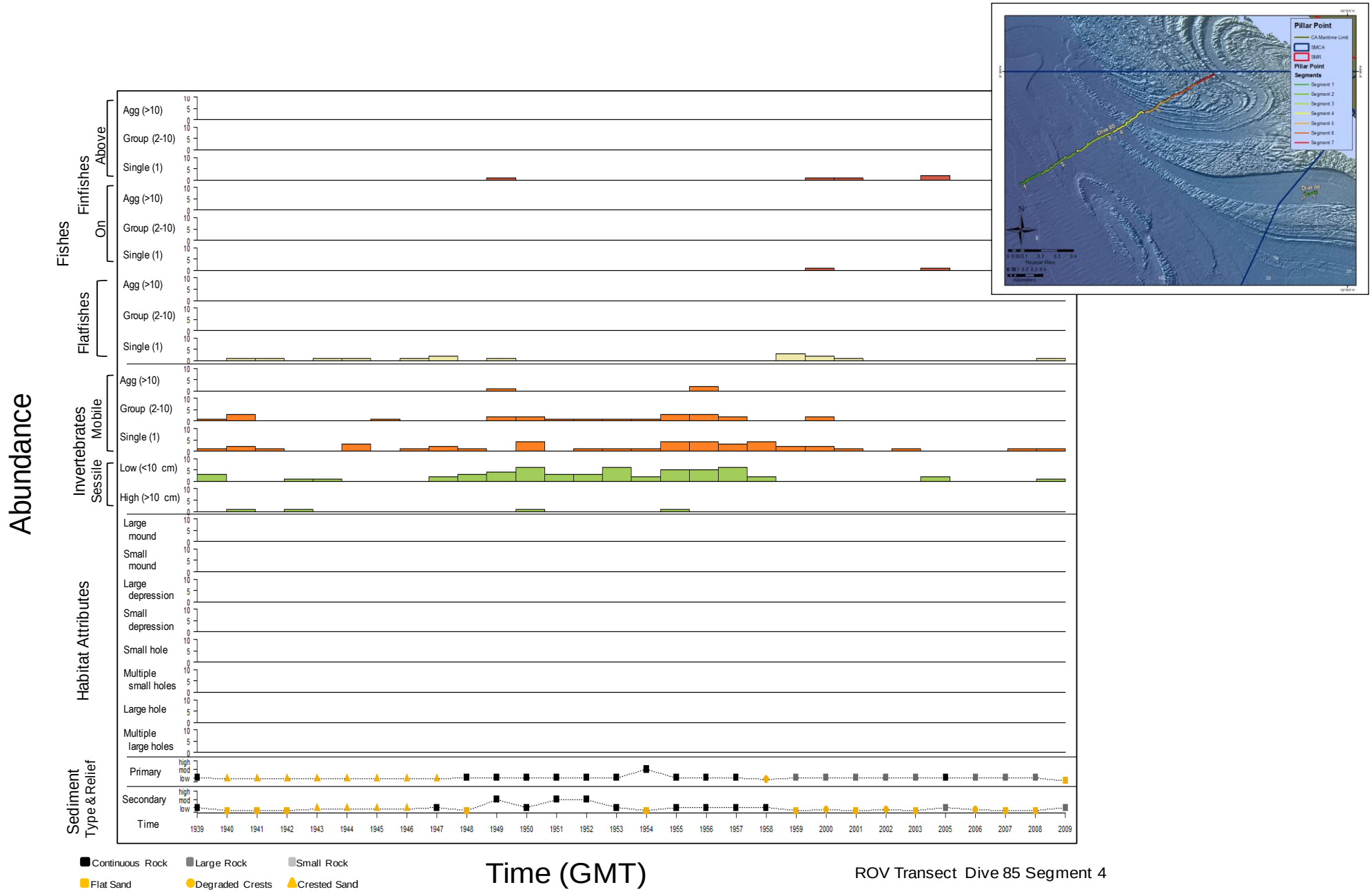

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 2000 2001 2002 2003 2005 2006 2007 2008 2009
Pillar Point
CA Maritime Limit
SMCA
SMR
Pillar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Dive 85
Dive 86
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 85 Segment 4

Figure 20

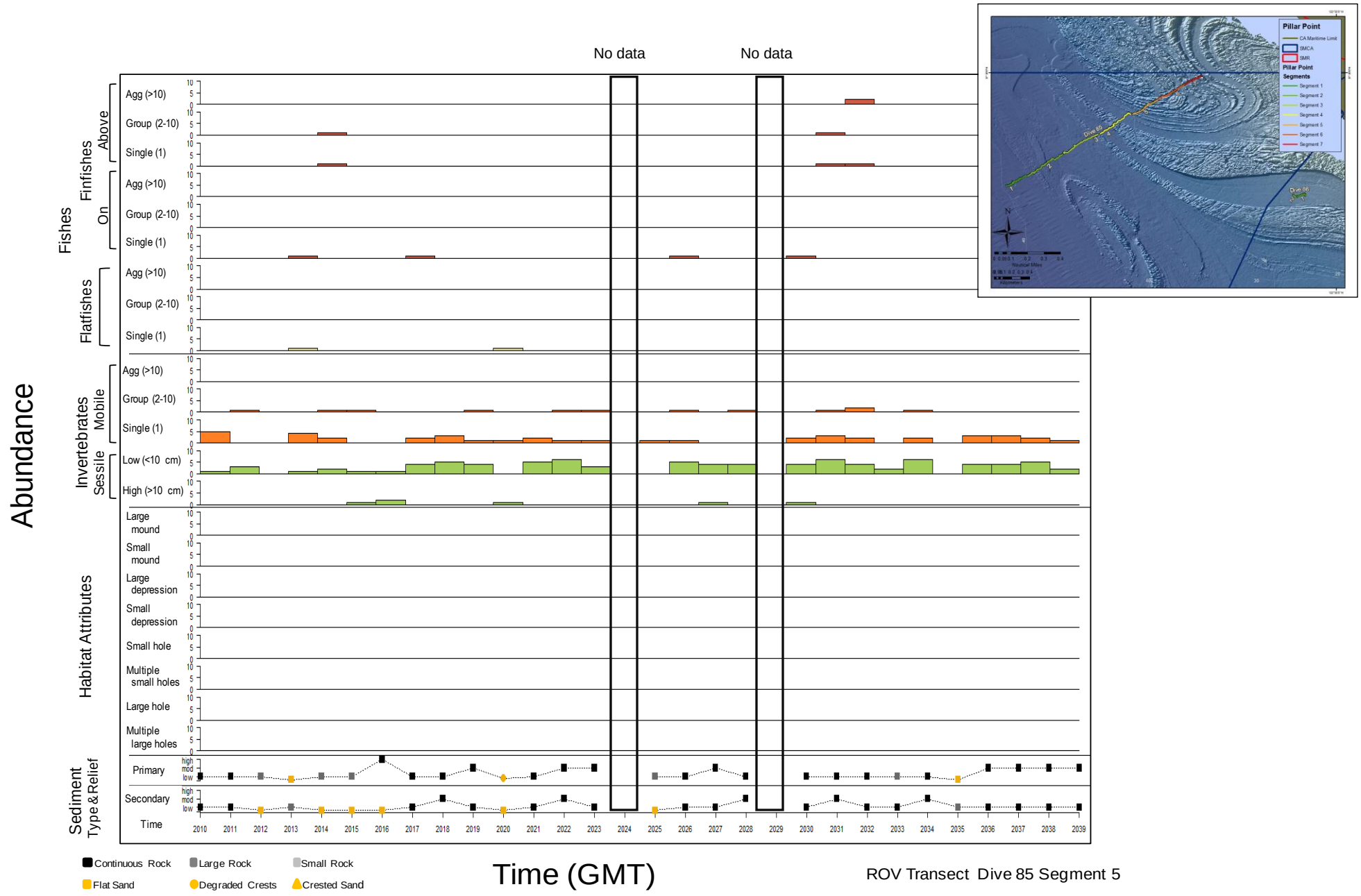

No data
No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038
2039
Pillar Point
CA Maritime Limit
SMCA
SMR
Pillar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Dive 85
Dive 86
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 85 Segment 5

Figure 21

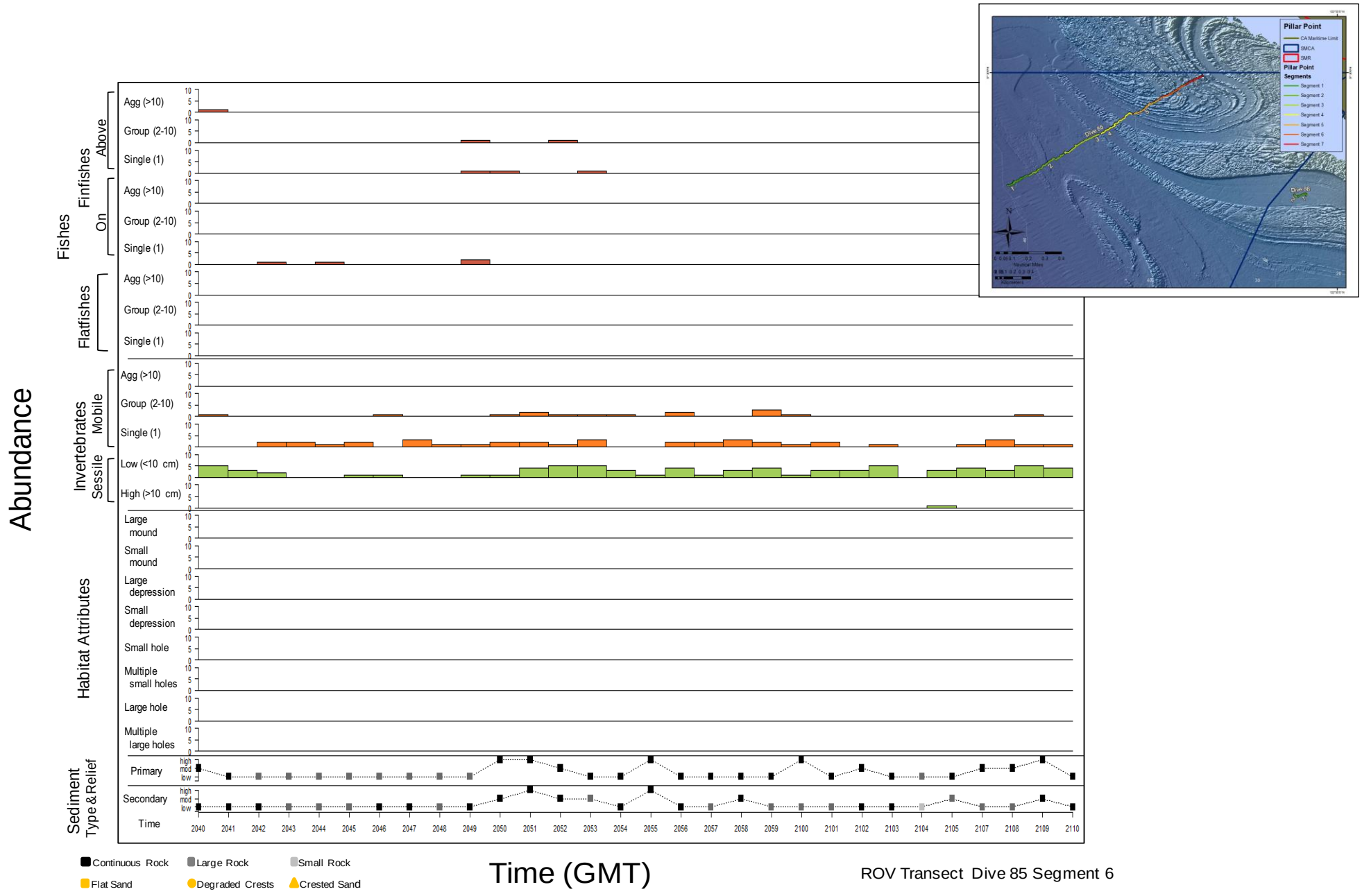

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2040
2041
2042
2043
2044
2045
2046
2047
2048
2049
2050
2051
2052
2053
2054
2055
2056
2057
2058
2059
2100
2101
2102
2103
2104
2105
2107
2108
2109
2110
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 85 Segment 6
Pilar Point
CA Maritime Limit
SMCA
SMR
Pilar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Dive 85
Dive 86

Figure 22

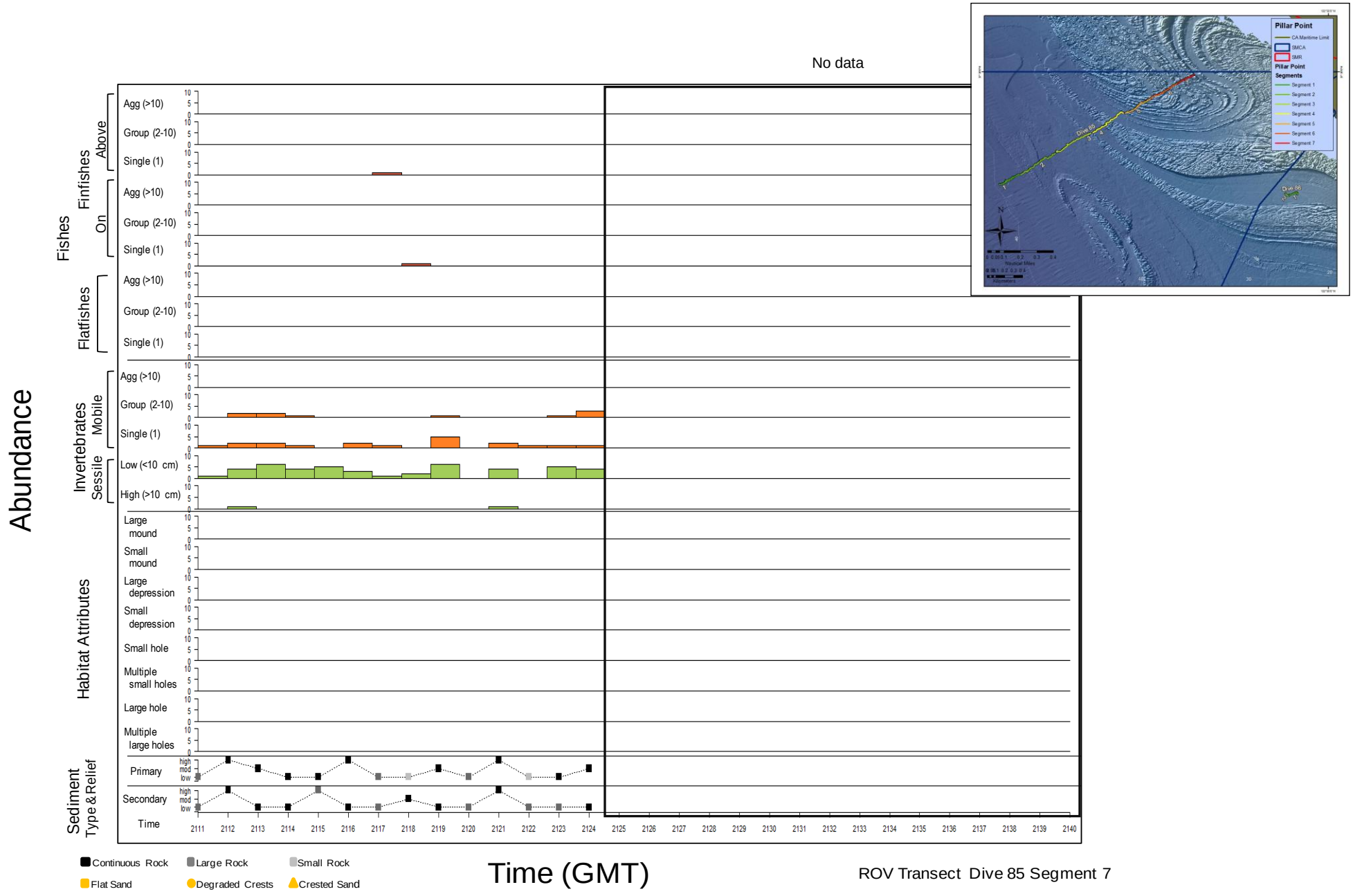

No data
Pillar Point
CA Maritime Limit
SMCA
SMR
Pillar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2111 2112 2113 2114 2115 2116 2117 2118 2119 2120 2121 2122 2123 2124 2125 2126 2127 2128 2129 2130 2131 2132 2133 2134 2135 2136 2137 2138 2139 2140
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 85 Segment 7

Figure 23

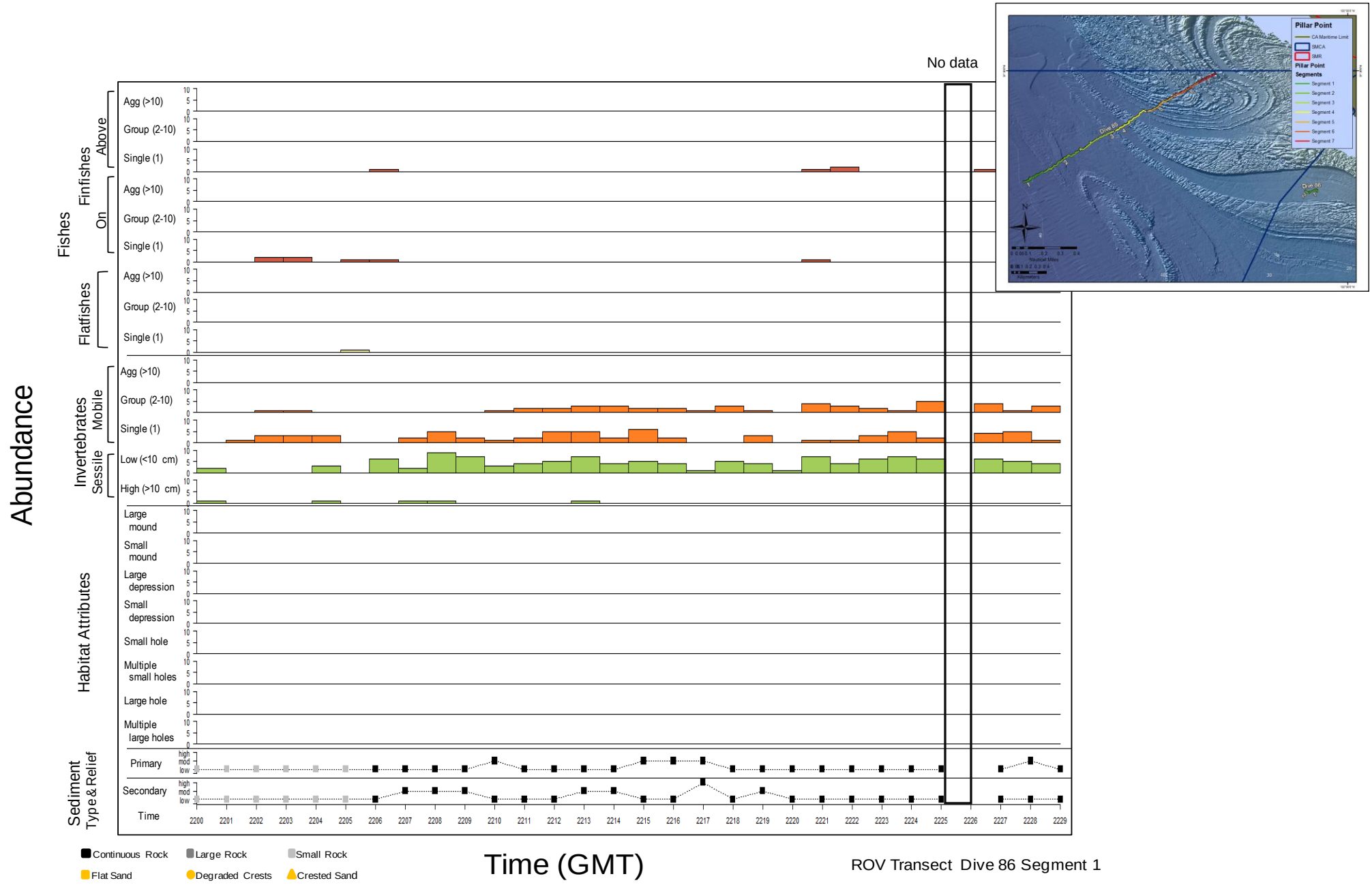

No data
Pillar Point
CA Maritime Limit
SMCA
SMR
Pillar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Dive 85
Dive 86
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2200
2201
2202
2203
2204
2205
2206
2207
2208
2209
2210
2211
2212
2213
2214
2215
2216
2217
2218
2219
2220
2221
2222
2223
2224
2225
2226
2227
2228
2229
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 86 Segment 1

Figure 24

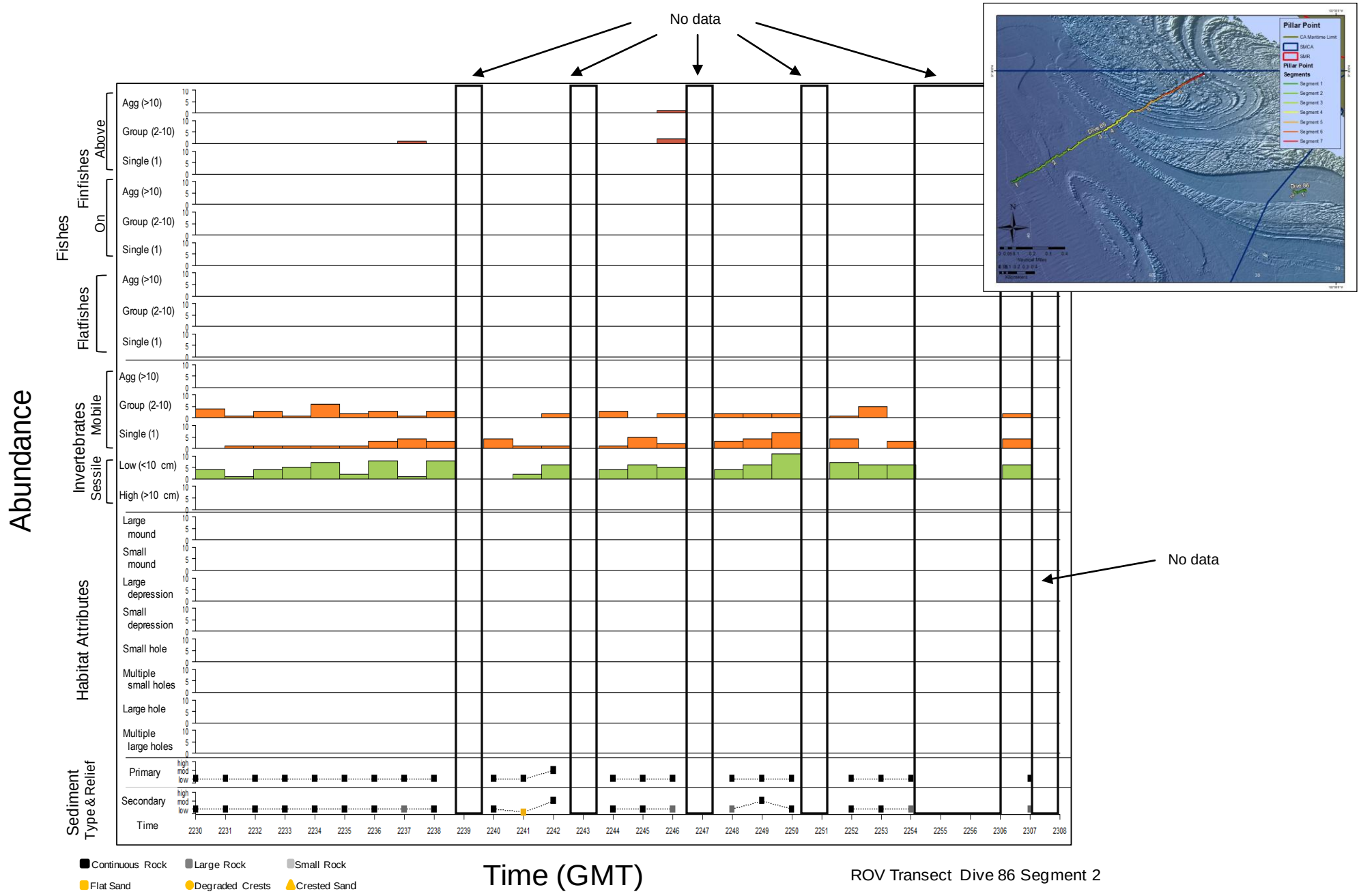

No data
Pillar Point
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2230
2231
2232
2233
2234
2235
2236
2237
2238
2239
2240
2241
2242
2243
2244
2245
2246
2247
2248
2249
2250
2251
2252
2253
2254
2255
2256
2306
2307
2308
No data
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 86 Segment 2

Figure 25

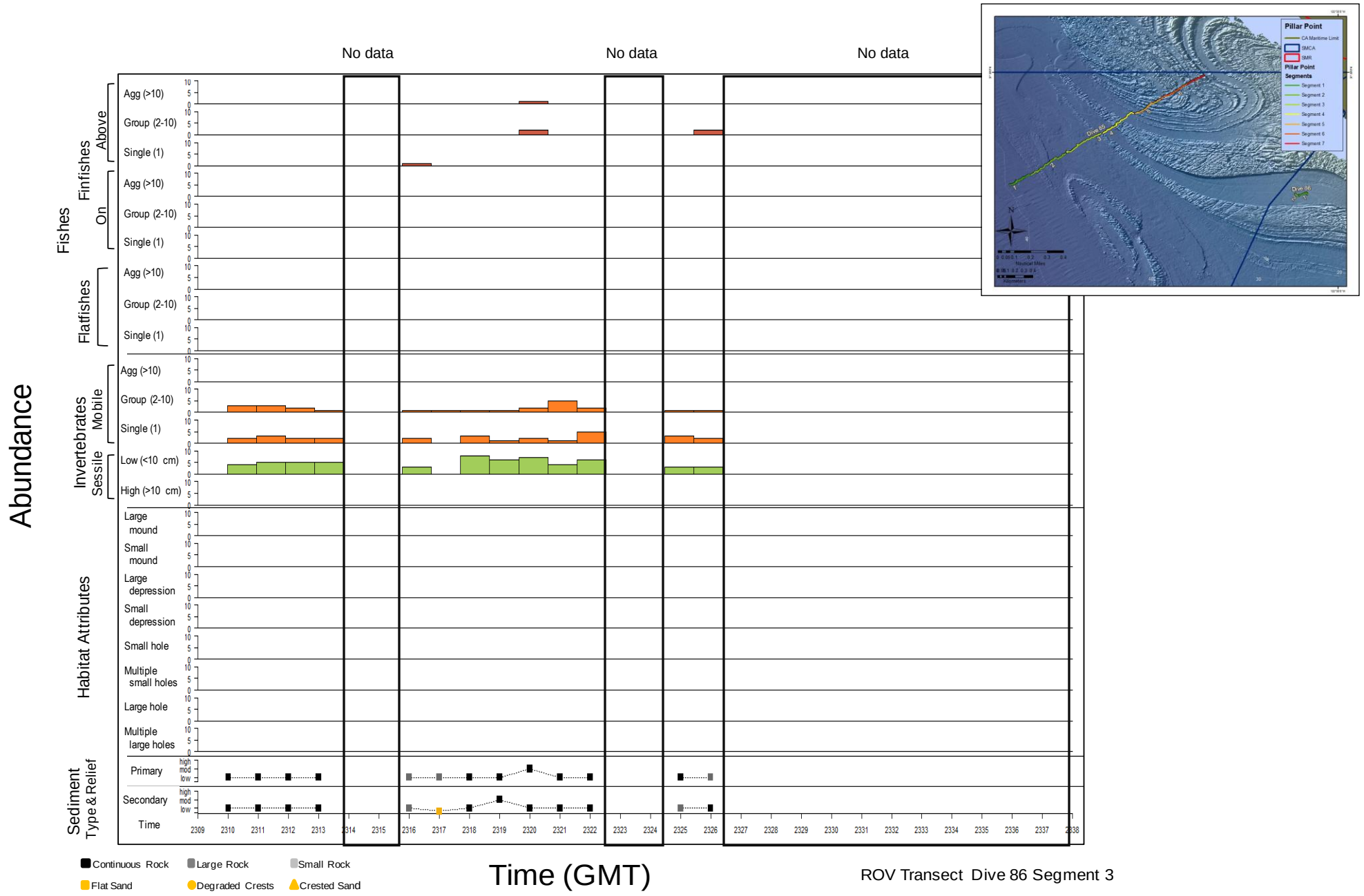

No data
No data
No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2309
2310
2311
2312
2313
2314
2315
2316
2317
2318
2319
2320
2321
2322
2323
2324
2325
2326
2327
2328
2329
2330
2331
2332
2333
2334
2335
2336
2337
2338
Pillar Point
CA Maritime Limit
SMCA
SMR
Pillar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Dive 85
Dive 86
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 86 Segment 3

Figure 26

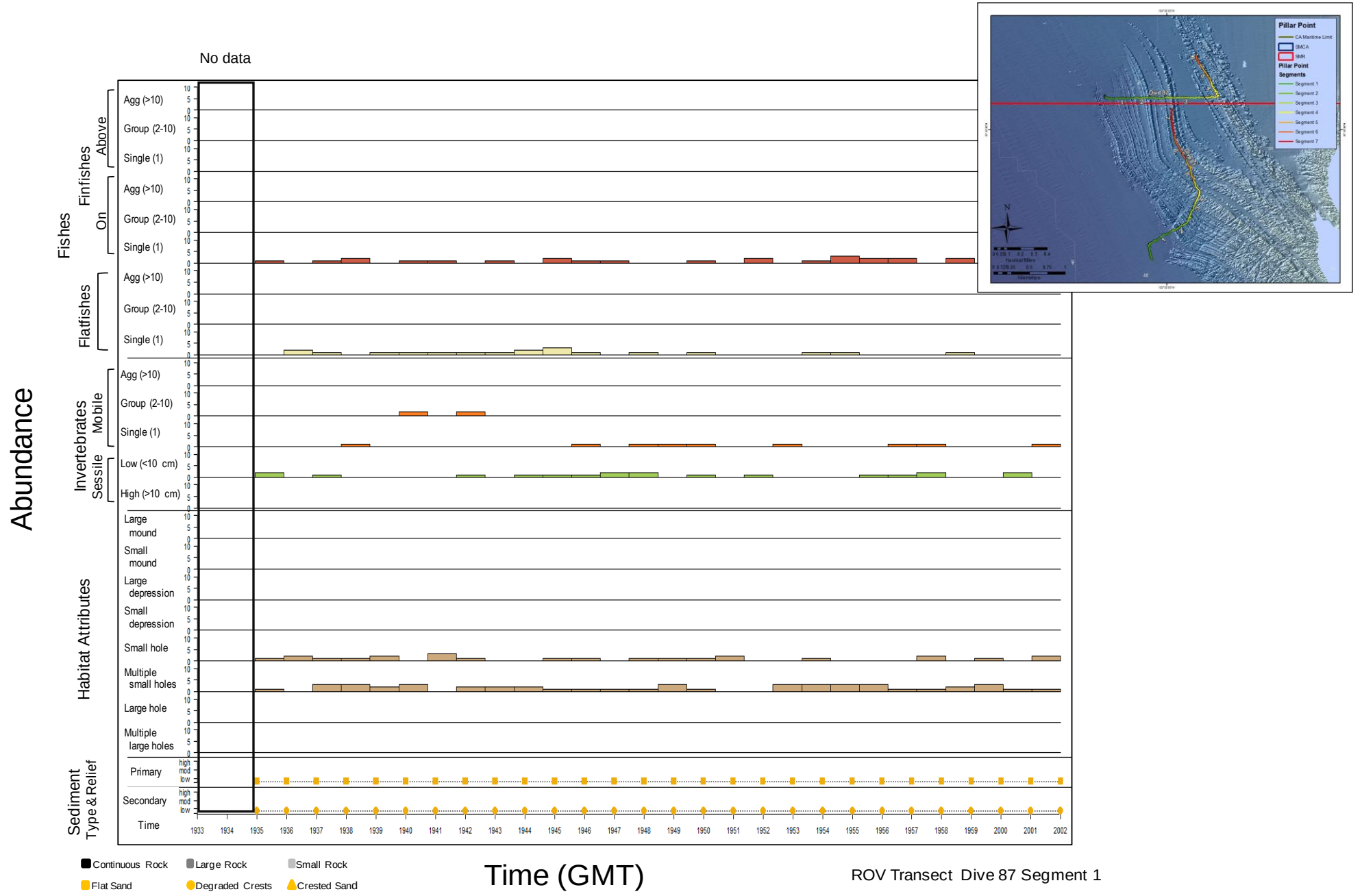

No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1933
1934
1935
1936
1937
1938
1939
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
1955
1956
1957
1958
1959
2000
2001
2002
Pillar Point
CA Maritime Limit
SMCA
SMR
Pillar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 87 Segment 1

Figure 27

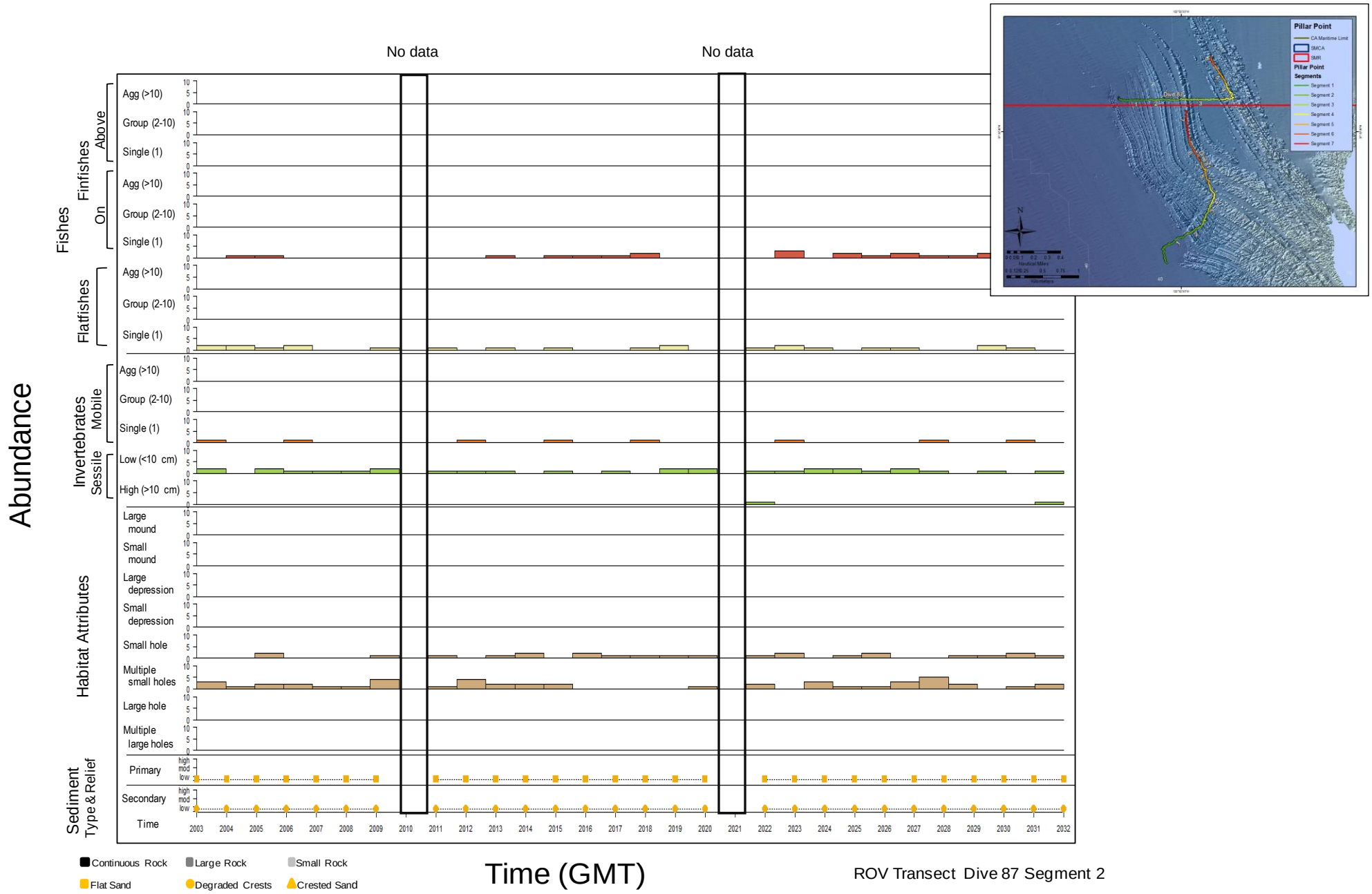

No data
No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
Pillar Point
CA Maritime Limit
SMCA
SMR
Pillar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
ROV Transect Dive 87 Segment 2

Figure 28

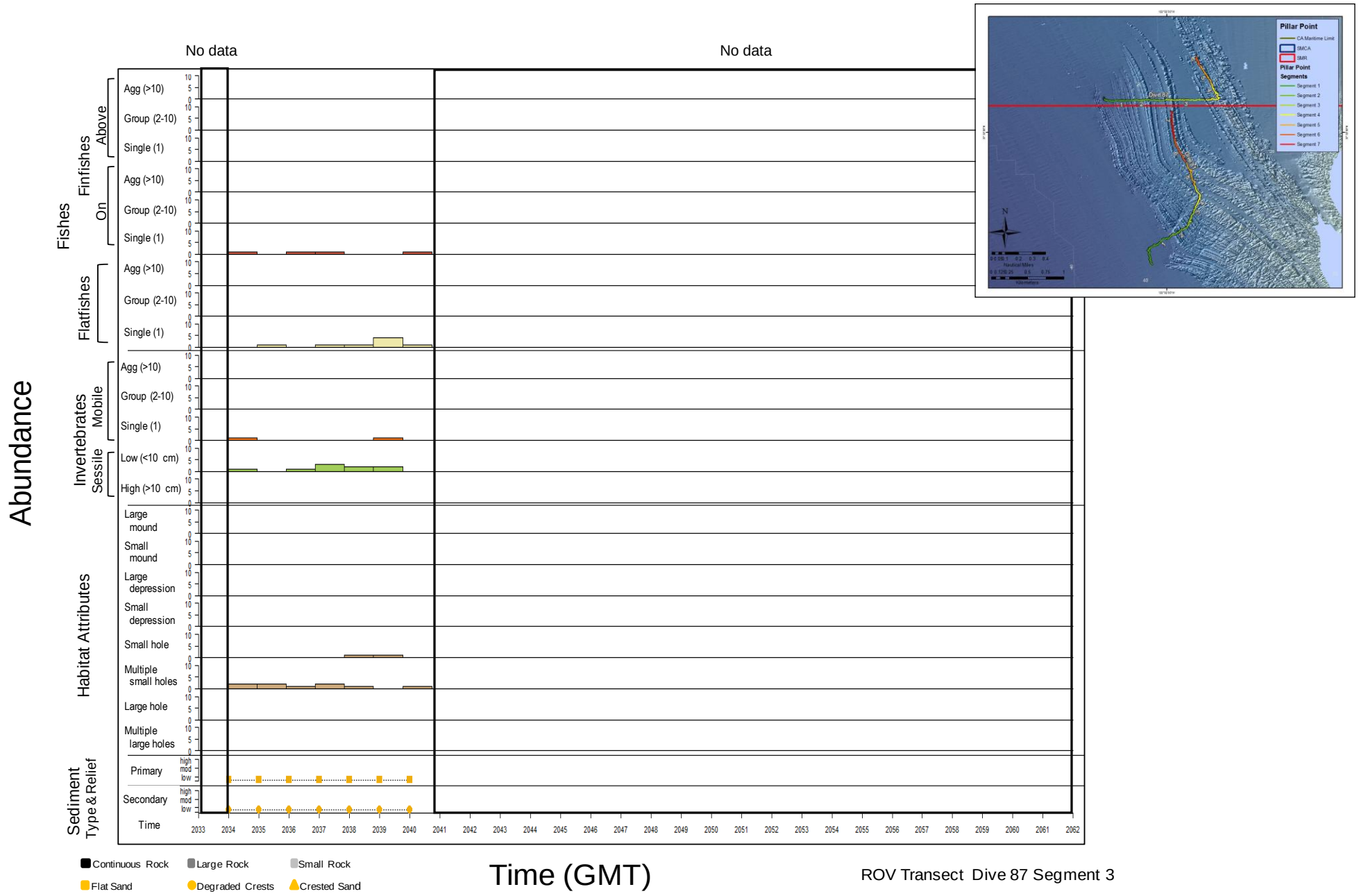

No data
No data
Pillar Point
CA Maritime Limit
SMCA
SMR
Pillar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2033
2034
2035
2036
2037
2038
2039
2040
2041
2042
2043
2044
2045
2046
2047
2048
2049
2050
2051
2052
2053
2054
2055
2056
2057
2058
2059
2060
2061
2062
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 87 Segment 3

Figure 29

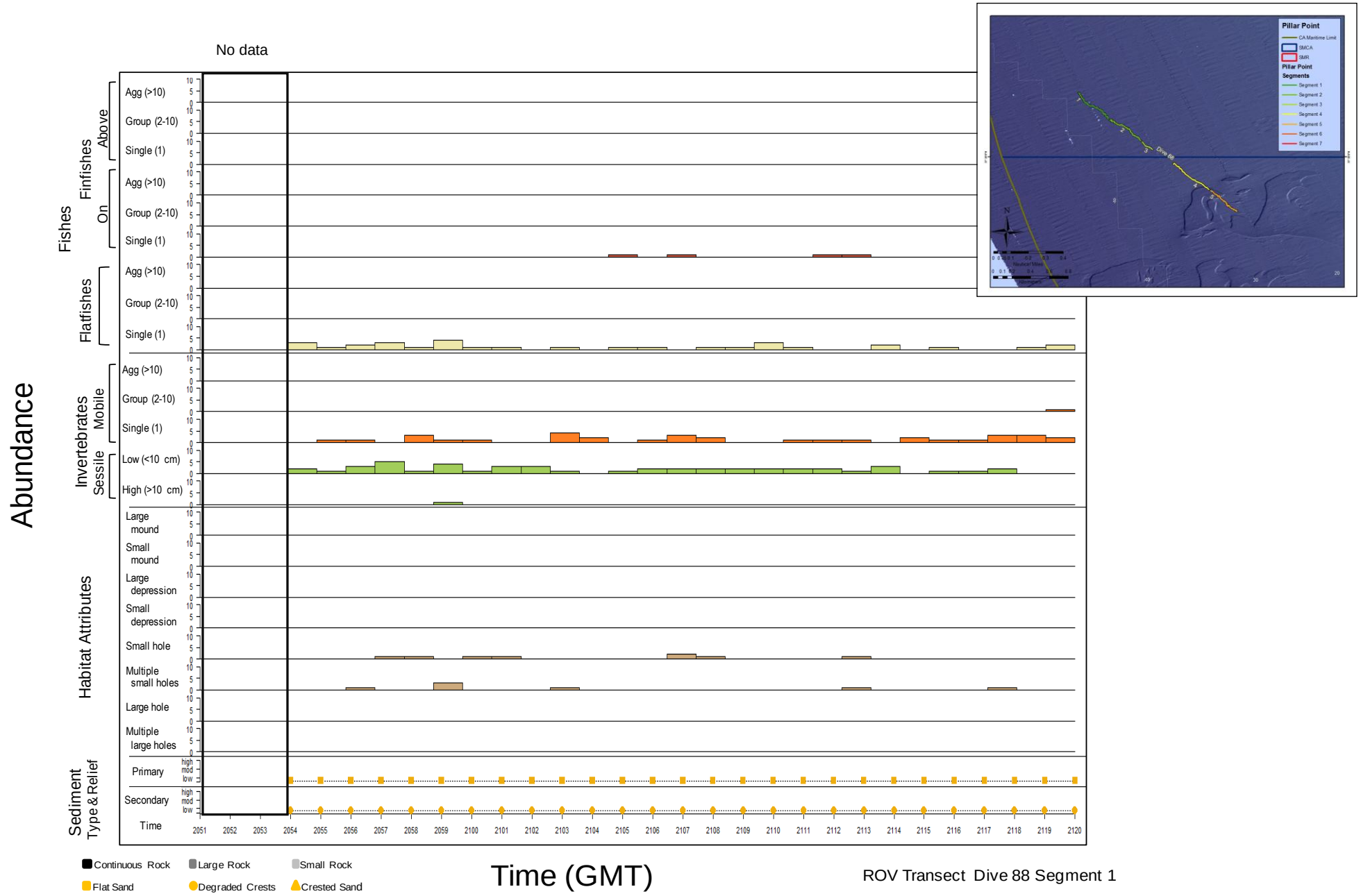

No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2051 2052 2053 2054 2055 2056 2057 2058 2059 2100 2101 2102 2103 2104 2105 2106 2107 2108 2109 2110 2111 2112 2113 2114 2115 2116 2117 2118 2119 2120
Pillar Point
CA Maritime Limit
SMCA
SMR
Pillar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Dive 88
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 88 Segment 1

Figure 30

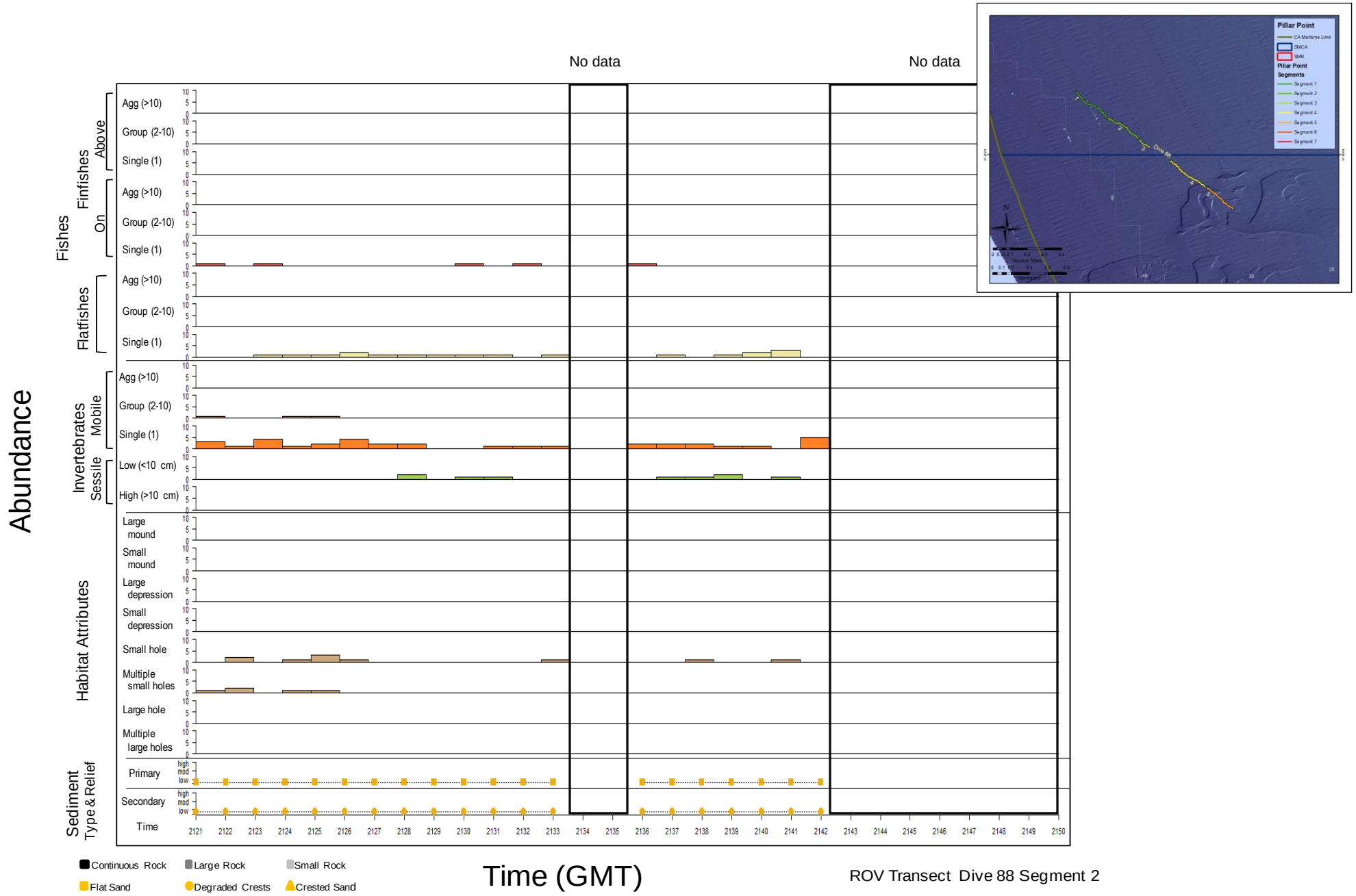

No data
No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2121
2122
2123
2124
2125
2126
2127
2128
2129
2130
2131
2132
2133
2134
2135
2136
2137
2138
2139
2140
2141
2142
2143
2144
2145
2146
2147
2148
2149
2150
Pillar Point
Segments
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 88 Segment 2

Figure 31

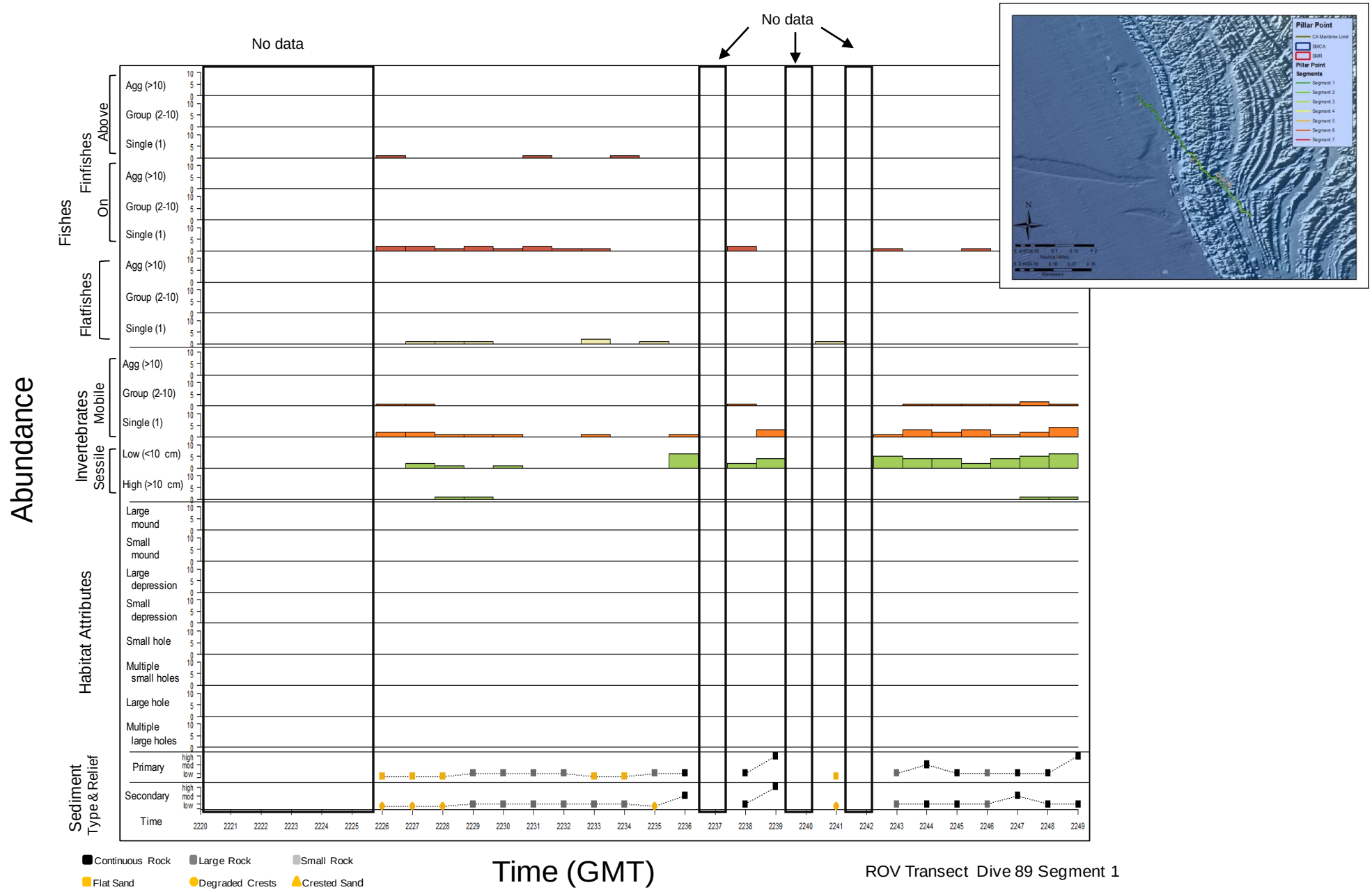

No data
No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2220
2221
2222
2223
2224
2225
2226
2227
2228
2229
2230
2231
2232
2233
2234
2235
2236
2237
2238
2239
2240
2241
2242
2243
2244
2245
2246
2247
2248
2249
Pillar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 89 Segment 1

Figure 32

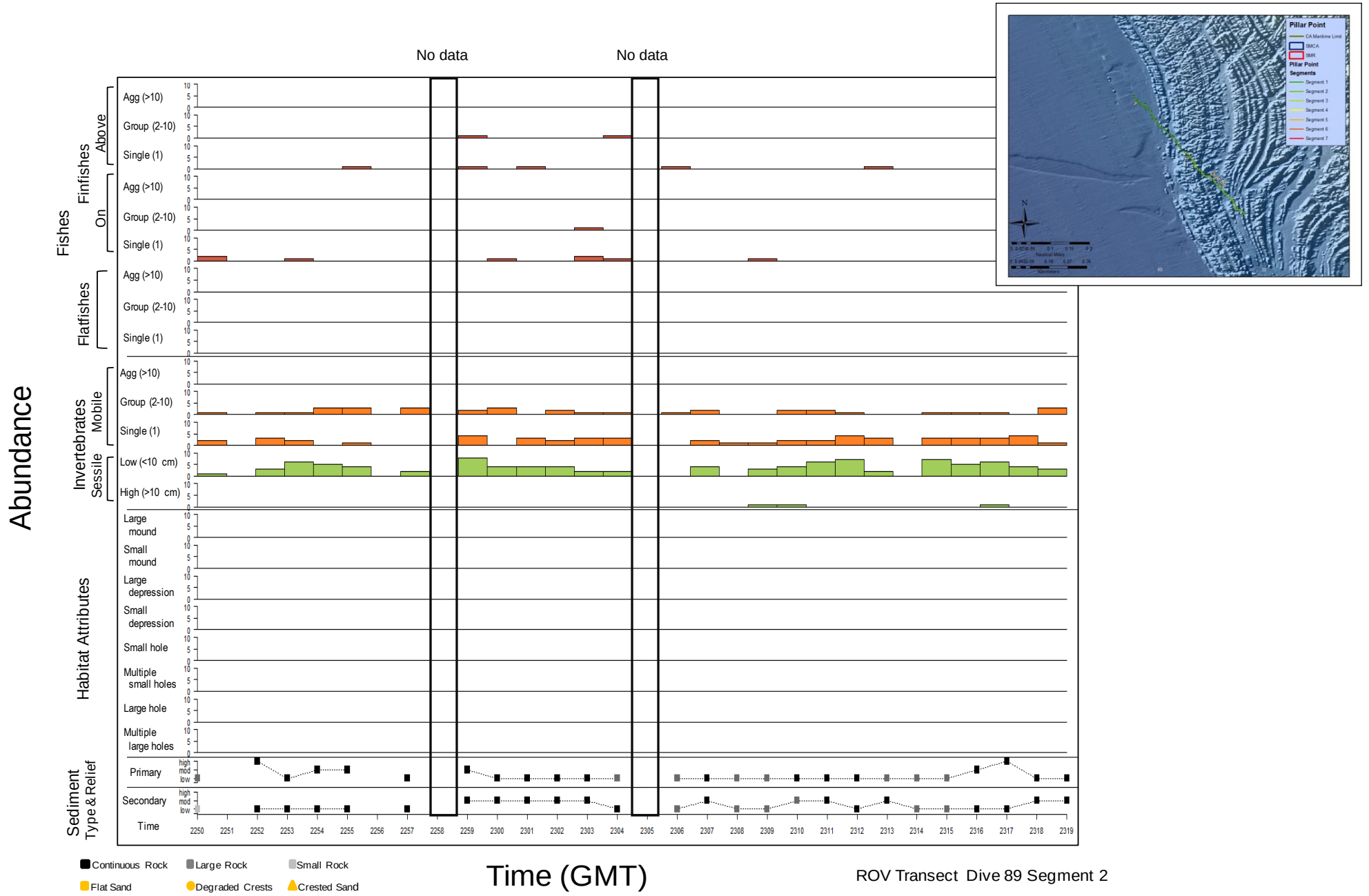

No data
No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2250
2251
2252
2253
2254
2255
2256
2257
2258
2259
2300
2301
2302
2303
2304
2305
2306
2307
2308
2309
2310
2311
2312
2313
2314
2315
2316
2317
2318
2319
Pillar Point
CA Maritime Limit
SMCA
SMR
Pillar Point
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
N
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 89 Segment 2

Figure 33

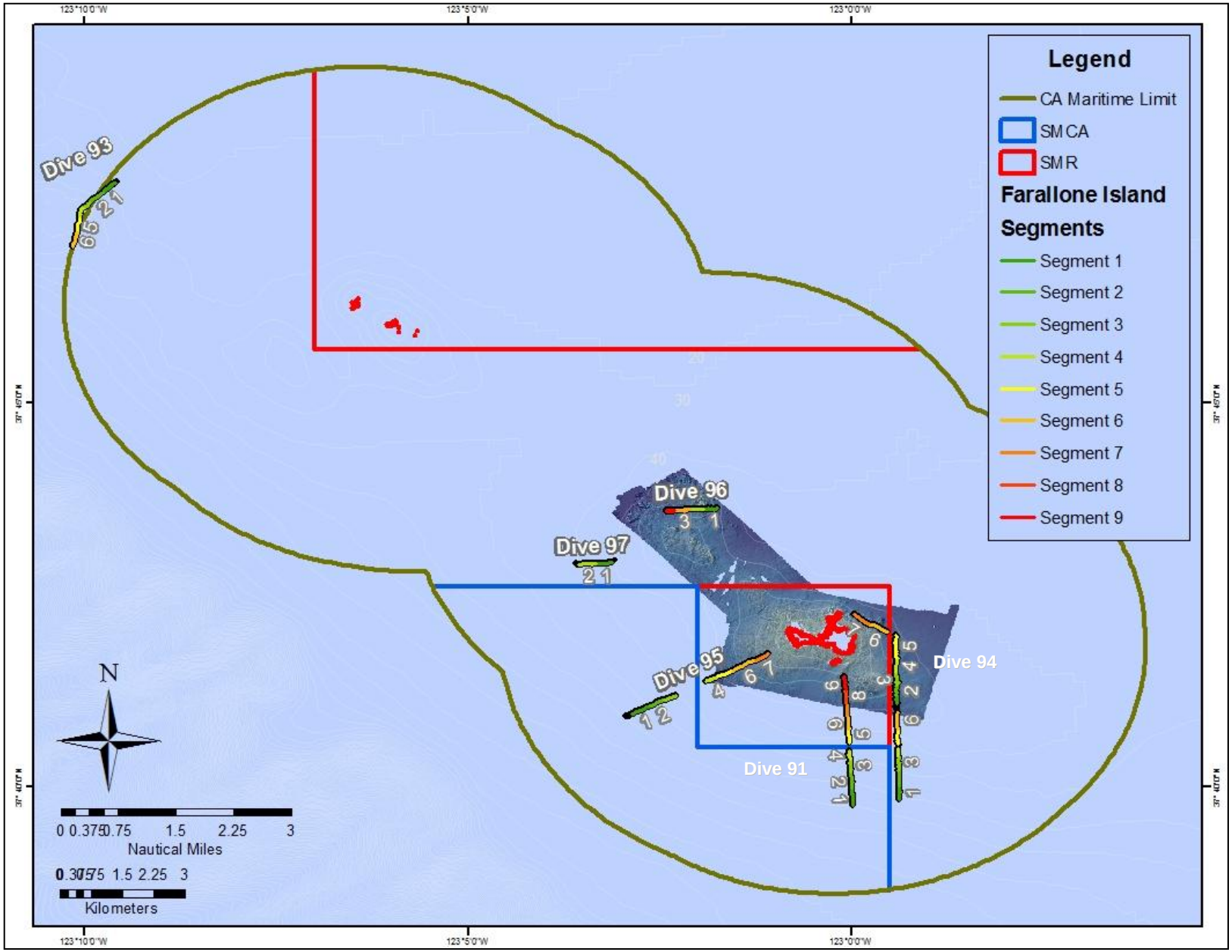


Figure 34: Farallon Islands SMR/SMCA Operating Area

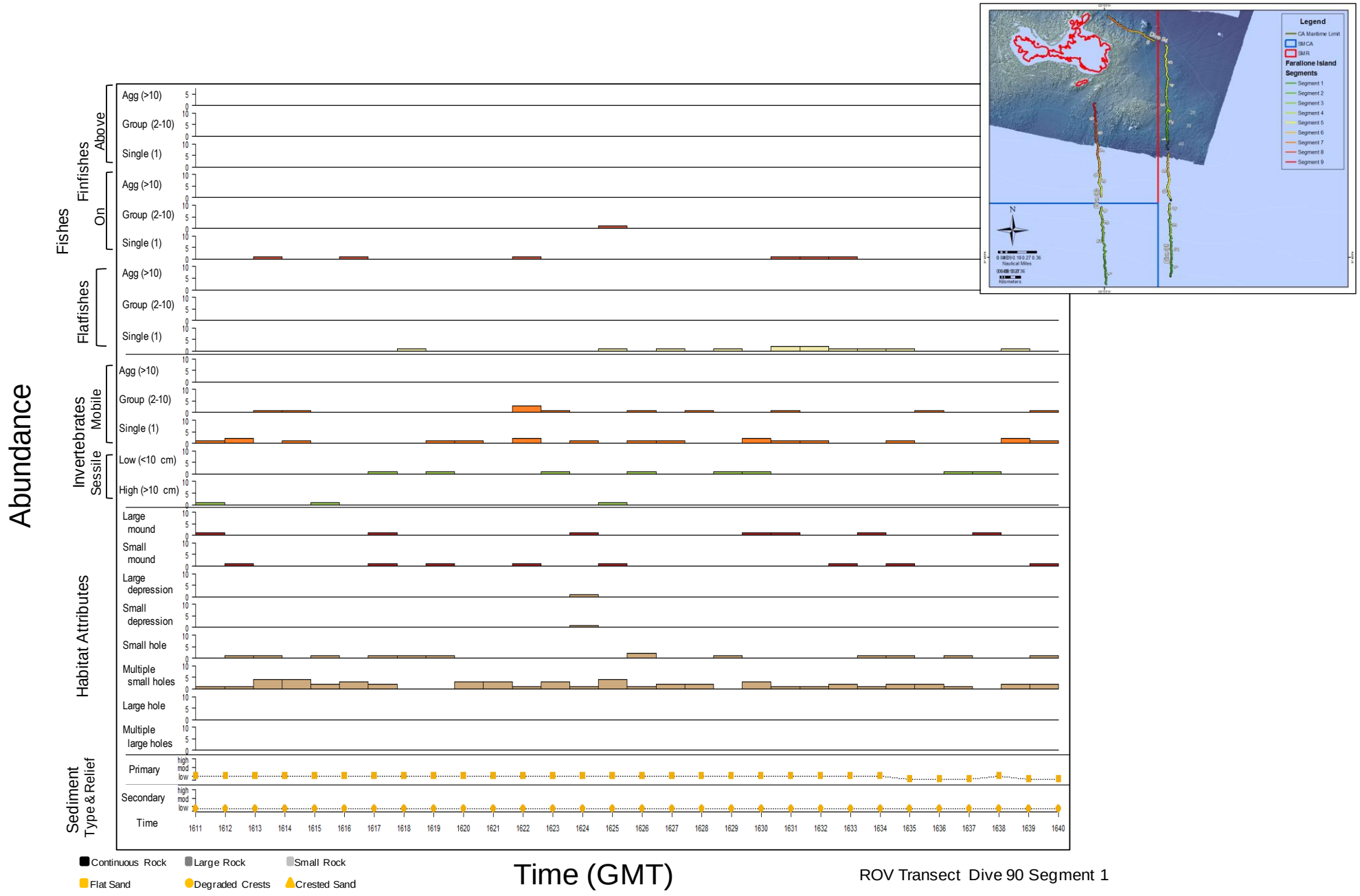

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1611 1612 1613 1614 1615 1616 1617 1618 1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1629 1630 1631 1632 1633 1634 1635 1636 1637 1638 1639 1640
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 90 Segment 1

Figure 35

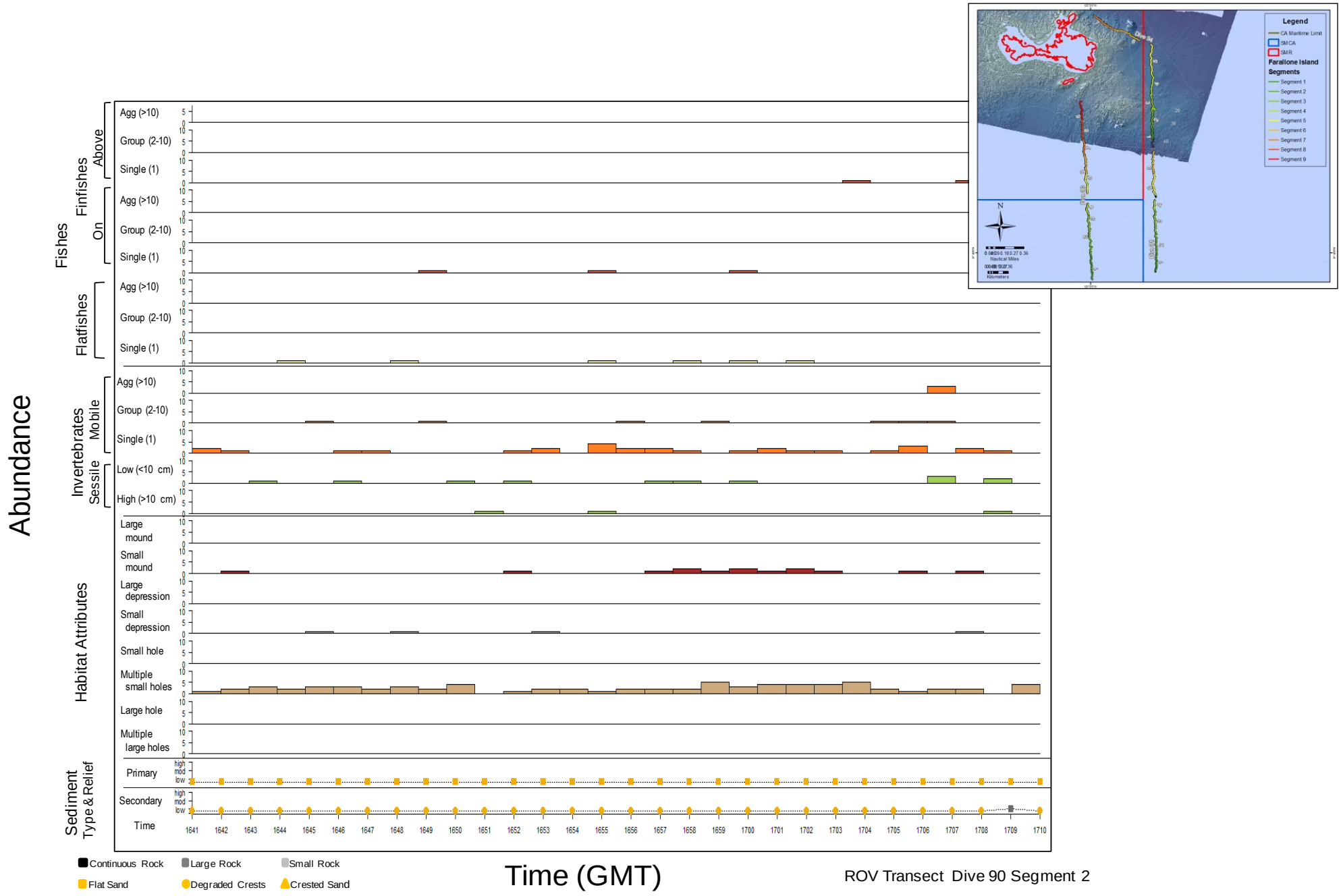

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1641 1642 1643 1644 1645 1646 1647 1648 1649 1650 1651 1652 1653 1654 1655 1656 1657 1658 1659 1700 1701 1702 1703 1704 1705 1706 1707 1708 1709 1710
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 90 Segment 2
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N

Figure 36

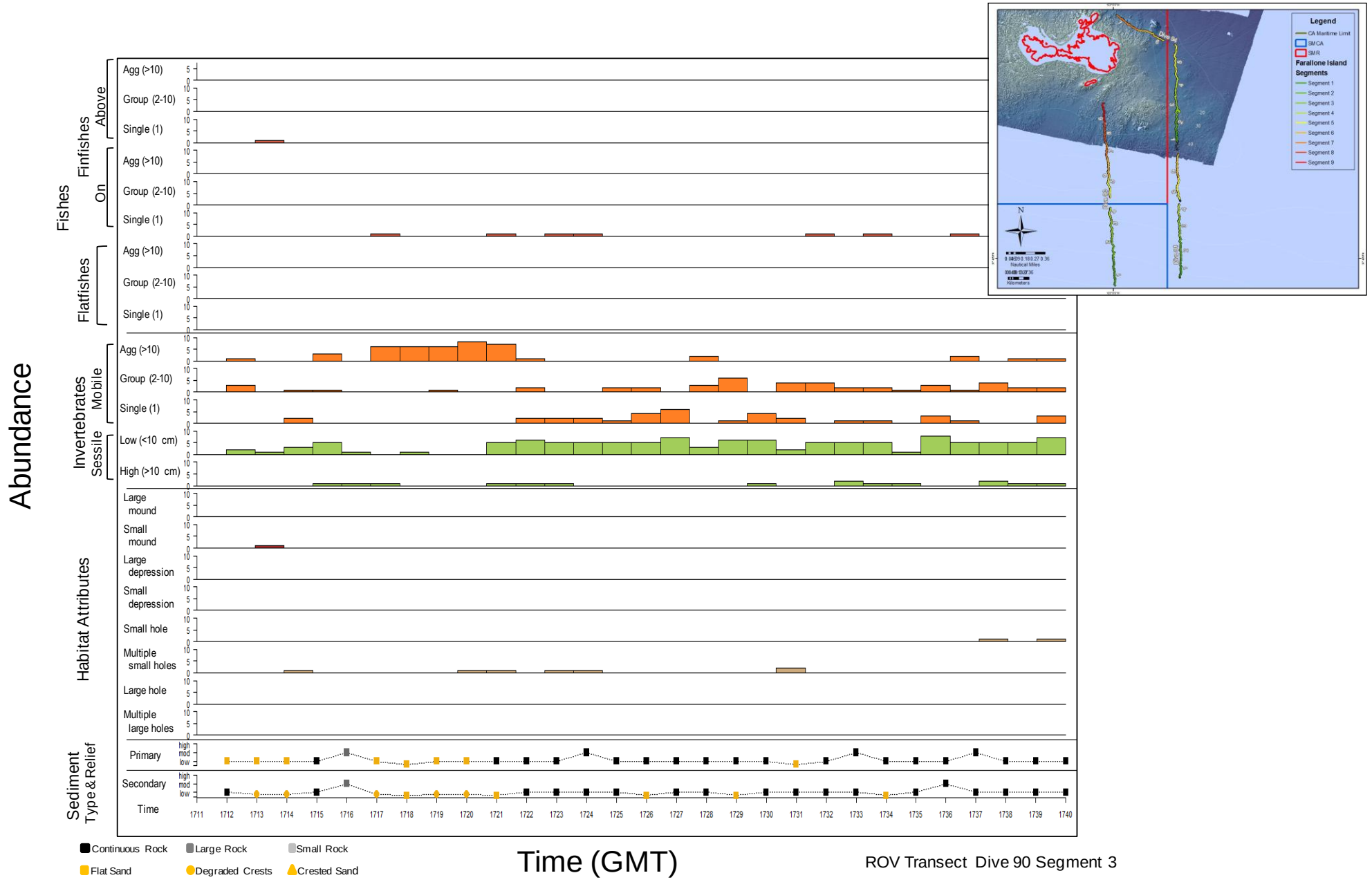

Abundance
Fishes
Finfishes
Above
Agg (>10)
Group (2-10)
Single (1)
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Agg (>10)
Group (2-10)
Single (1)
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
1711 1712 1713 1714 1715 1716 1717 1718 1719 1720 1721 1722 1723 1724 1725 1726 1727 1728 1729 1730 1731 1732 1733 1734 1735 1736 1737 1738 1739 1740
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 90 Segment 3

Figure 37

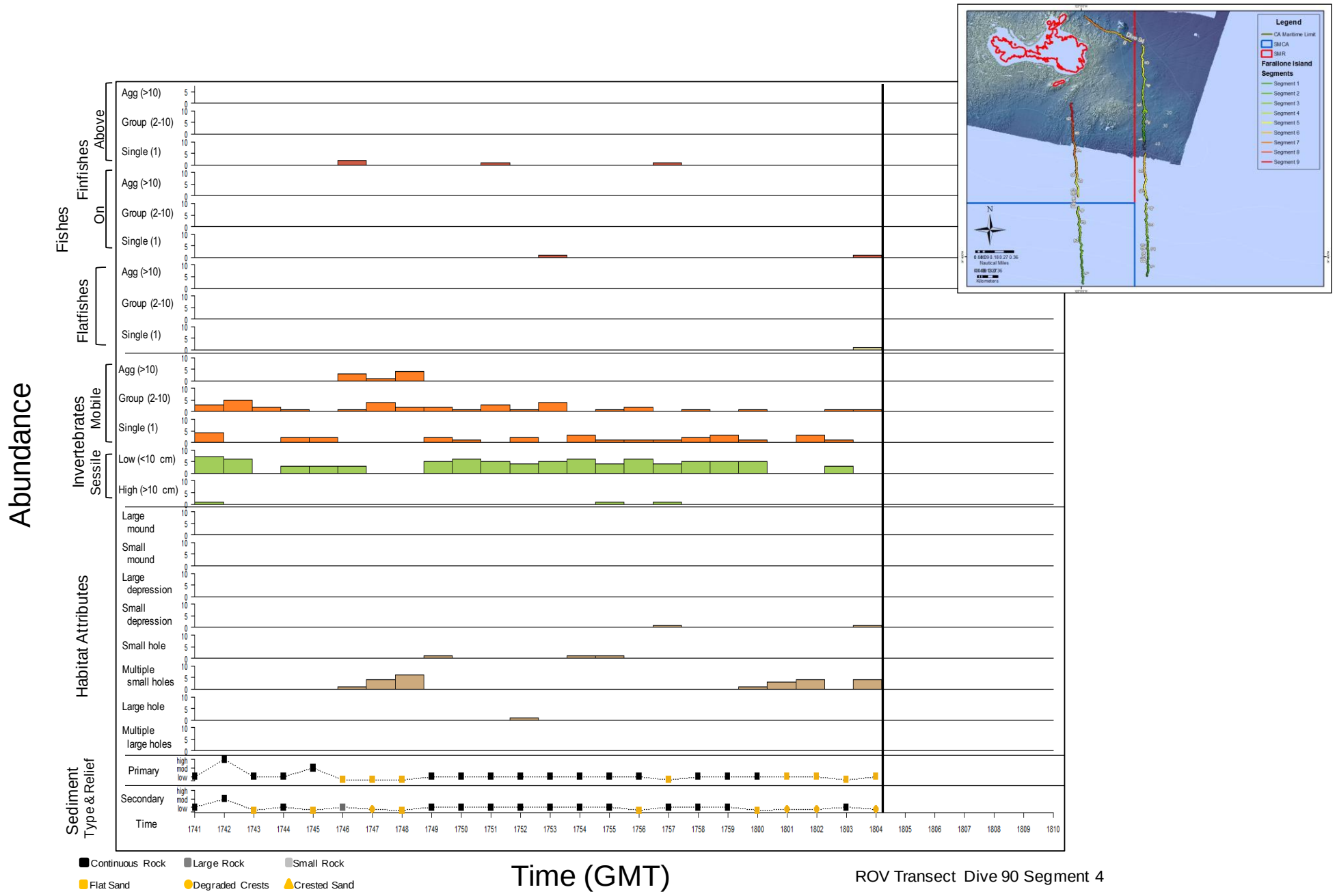

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
1741 1742 1743 1744 1745 1746 1747 1748 1749 1750 1751 1752 1753 1754 1755 1756 1757 1758 1759 1800 1801 1802 1803 1804 1805 1806 1807 1808 1809 1810
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Nautical Miles
Kilometers
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 90 Segment 4

Figure 38

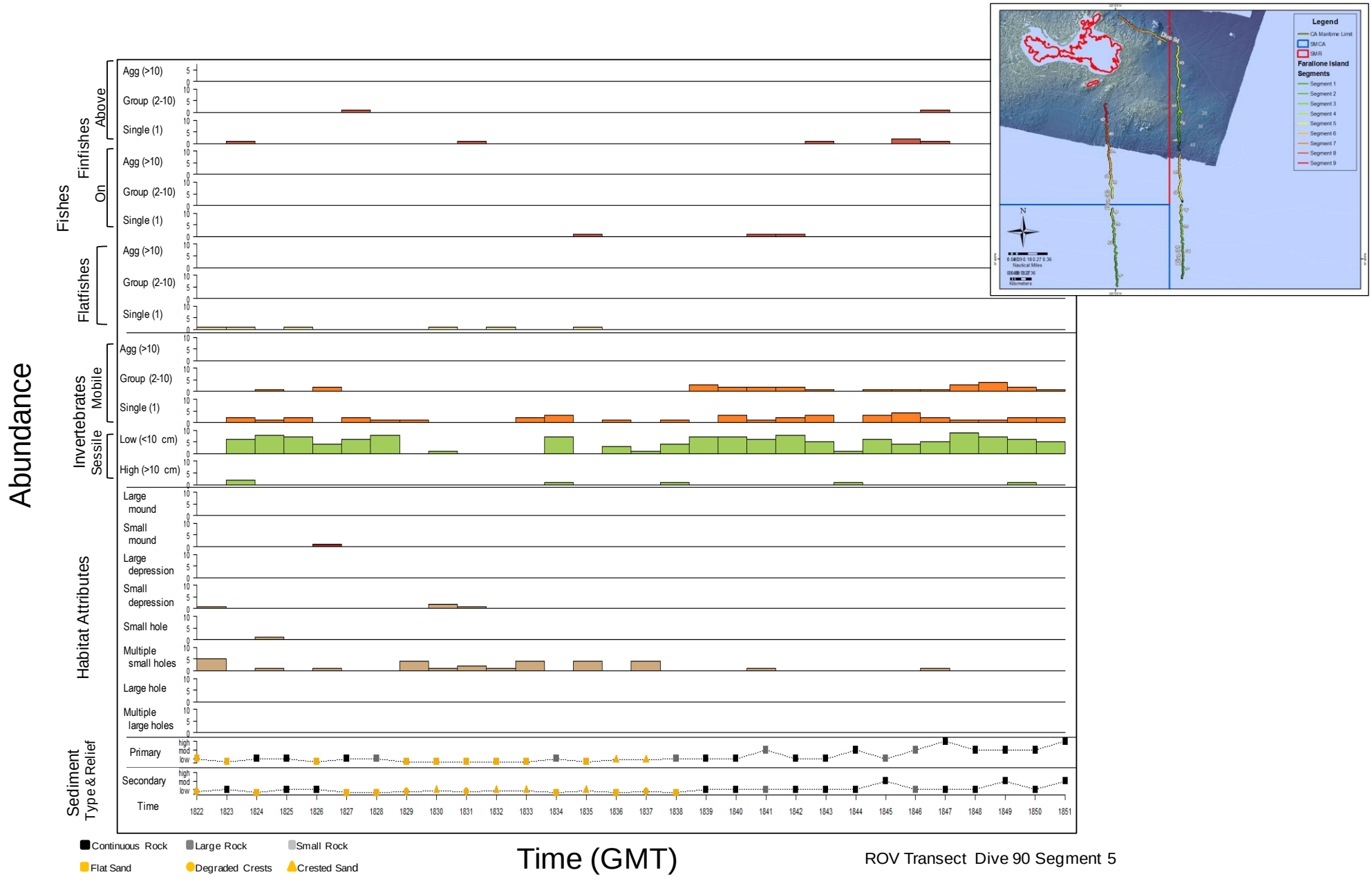

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1822
1823
1824
1825
1826
1827
1828
1829
1830
1831
1832
1833
1834
1835
1836
1837
1838
1839
1840
1841
1842
1843
1844
1845
1846
1847
1848
1849
1850
1851
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 90 Segment 5

Figure 39

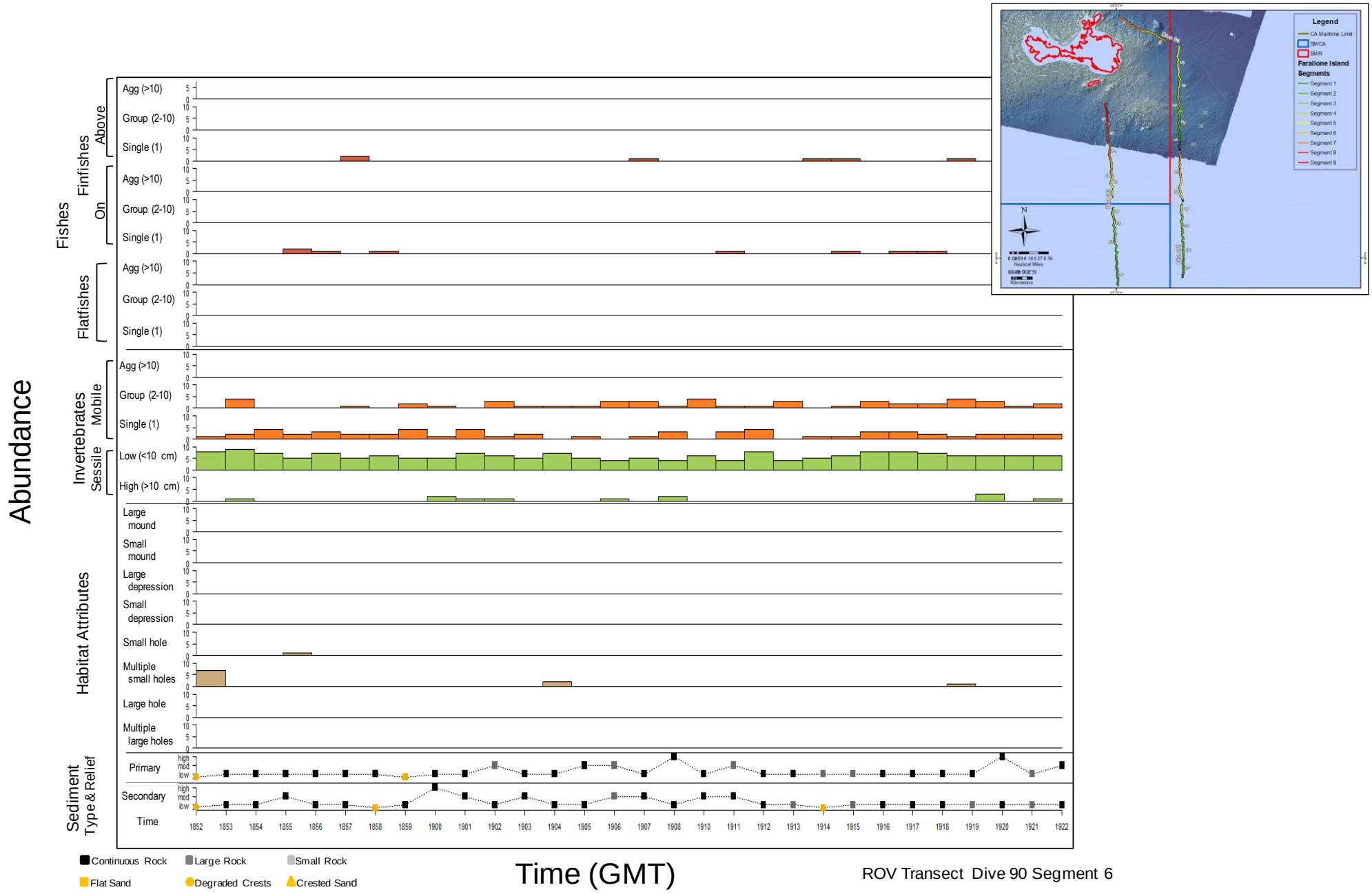

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1852 1853 1854 1855 1856 1857 1858 1859 1900 1901 1902 1903 1904 1905 1906 1907 1908 1910 1911 1912 1913 1914 1915 1916 1917 1918 1919 1920 1921 1922
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 90 Segment 6
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N

Figure 40

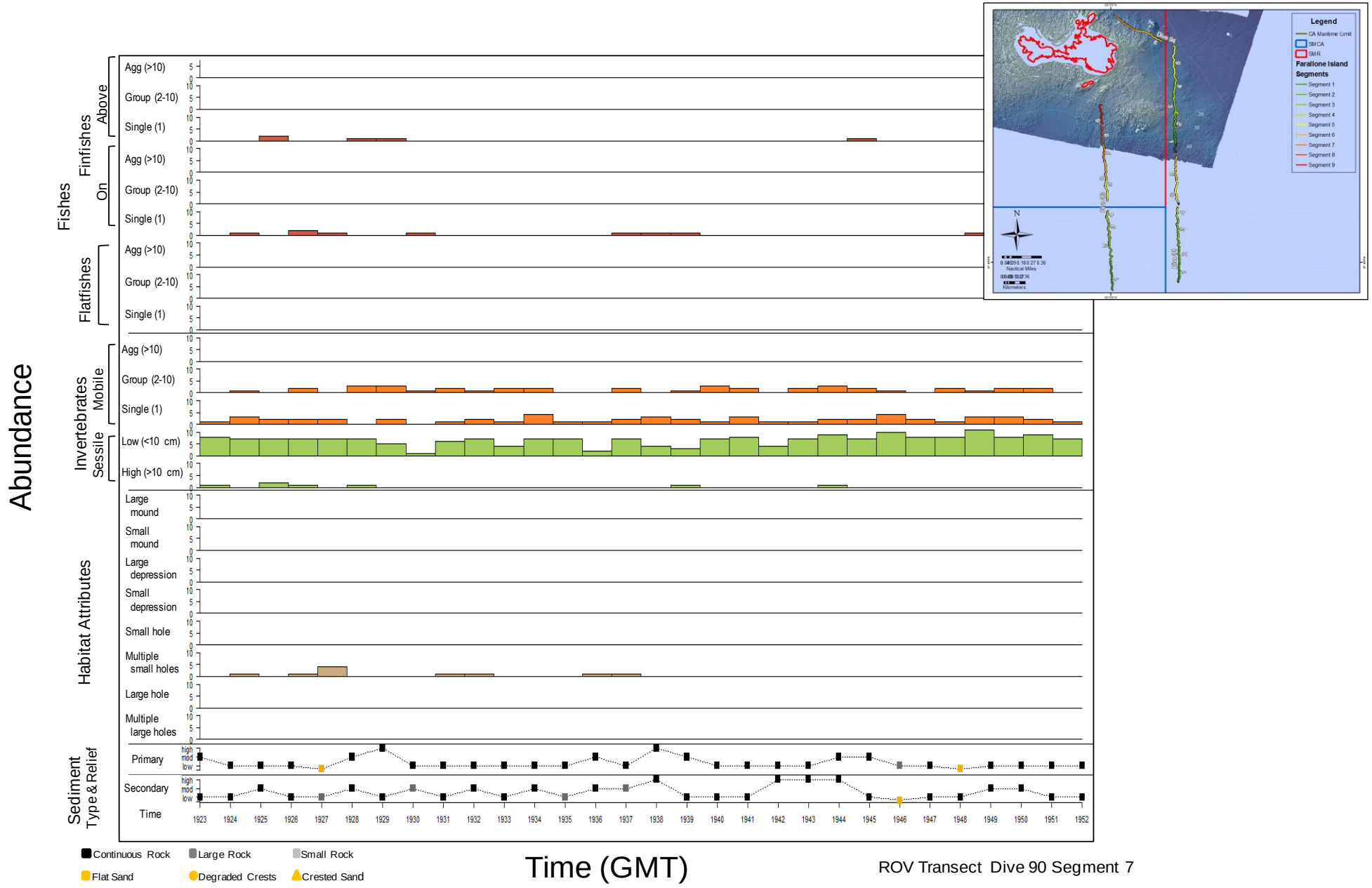

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1923
1924
1925
1926
1927
1928
1929
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 90 Segment 7

Figure 41

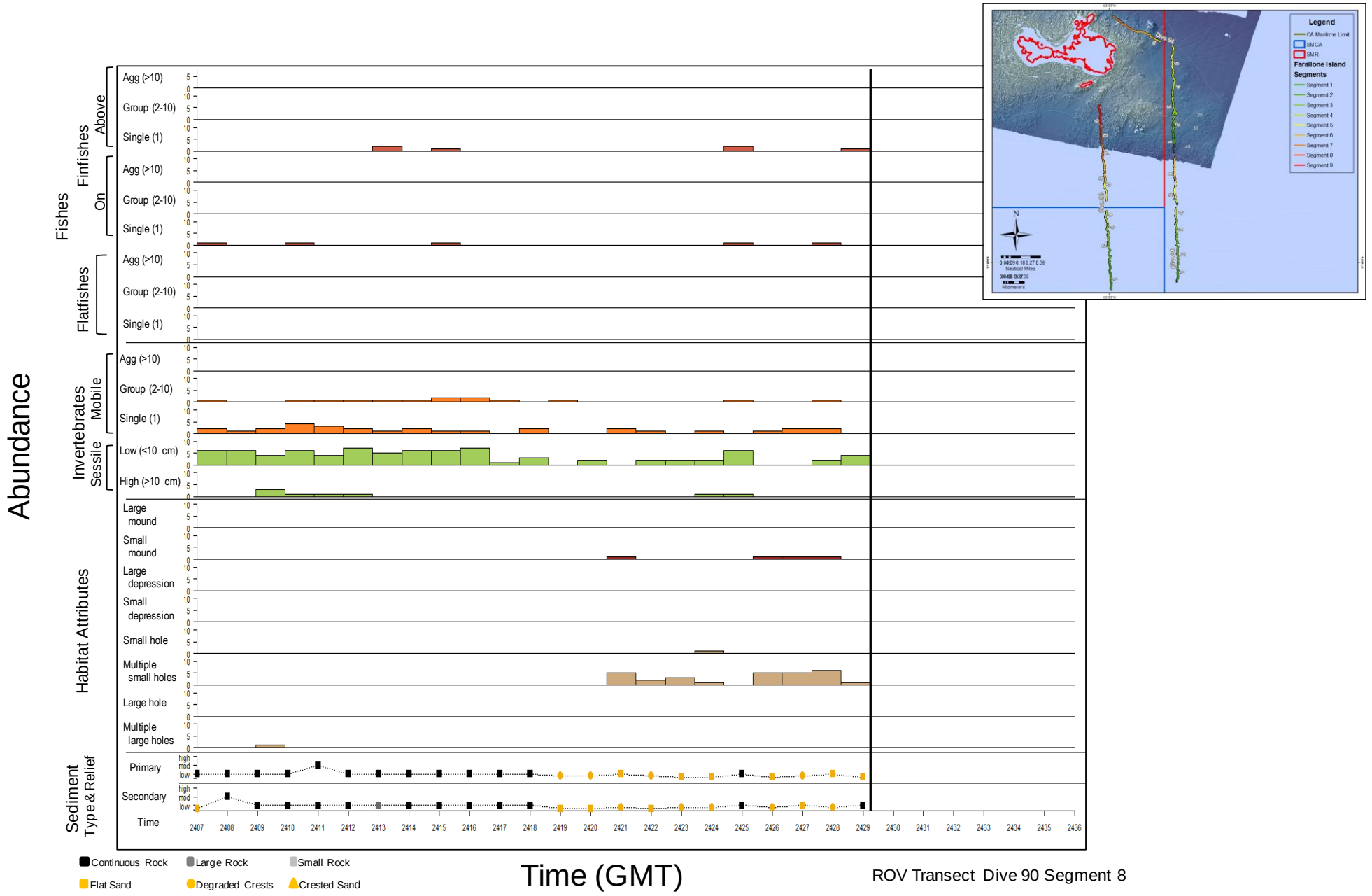

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2407
2408
2409
2410
2411
2412
2413
2414
2415
2416
2417
2418
2419
2420
2421
2422
2423
2424
2425
2426
2427
2428
2429
2430
2431
2432
2433
2434
2435
2436
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 90 Segment 8

Figure 42

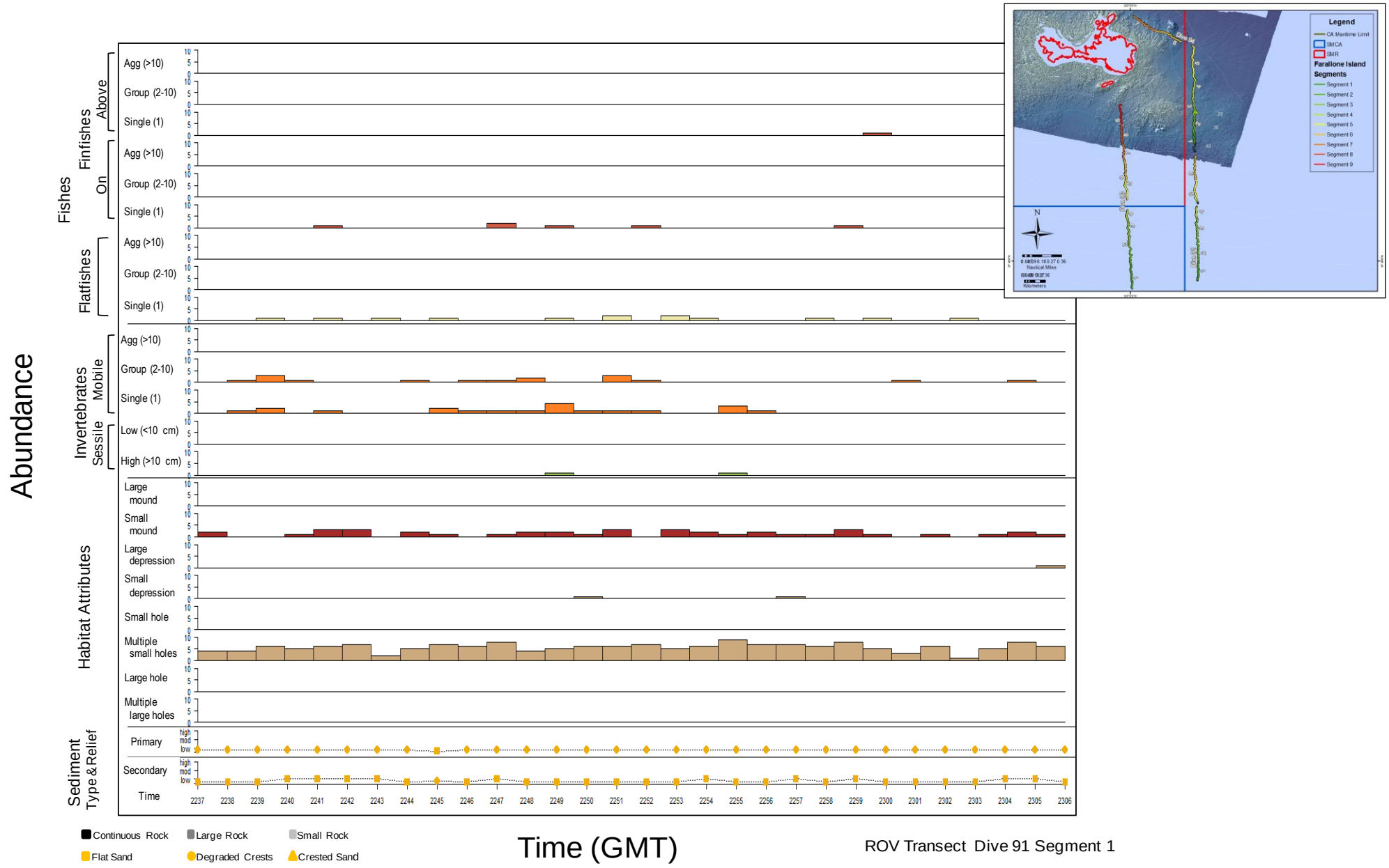

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2237
2238
2239
2240
2241
2242
2243
2244
2245
2246
2247
2248
2249
2250
2251
2252
2253
2254
2255
2256
2257
2258
2259
2300
2301
2302
2303
2304
2305
2306
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Nautical Miles
Kilometers
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 91 Segment 1

Figure 43

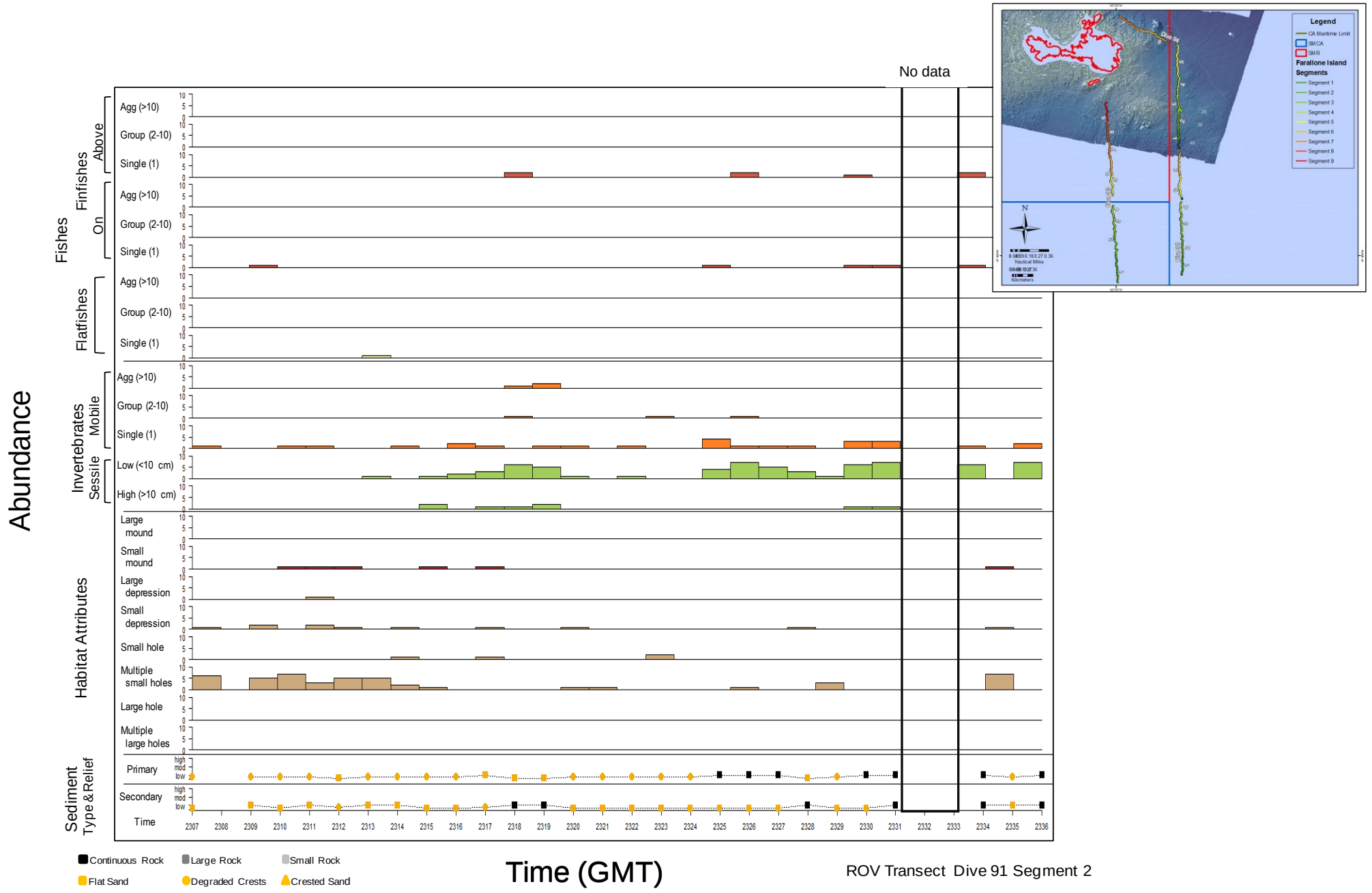

No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2307
2308
2309
2310
2311
2312
2313
2314
2315
2316
2317
2318
2319
2320
2321
2322
2323
2324
2325
2326
2327
2328
2329
2330
2331
2332
2333
2334
2335
2336
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 91 Segment 2

Figure 44

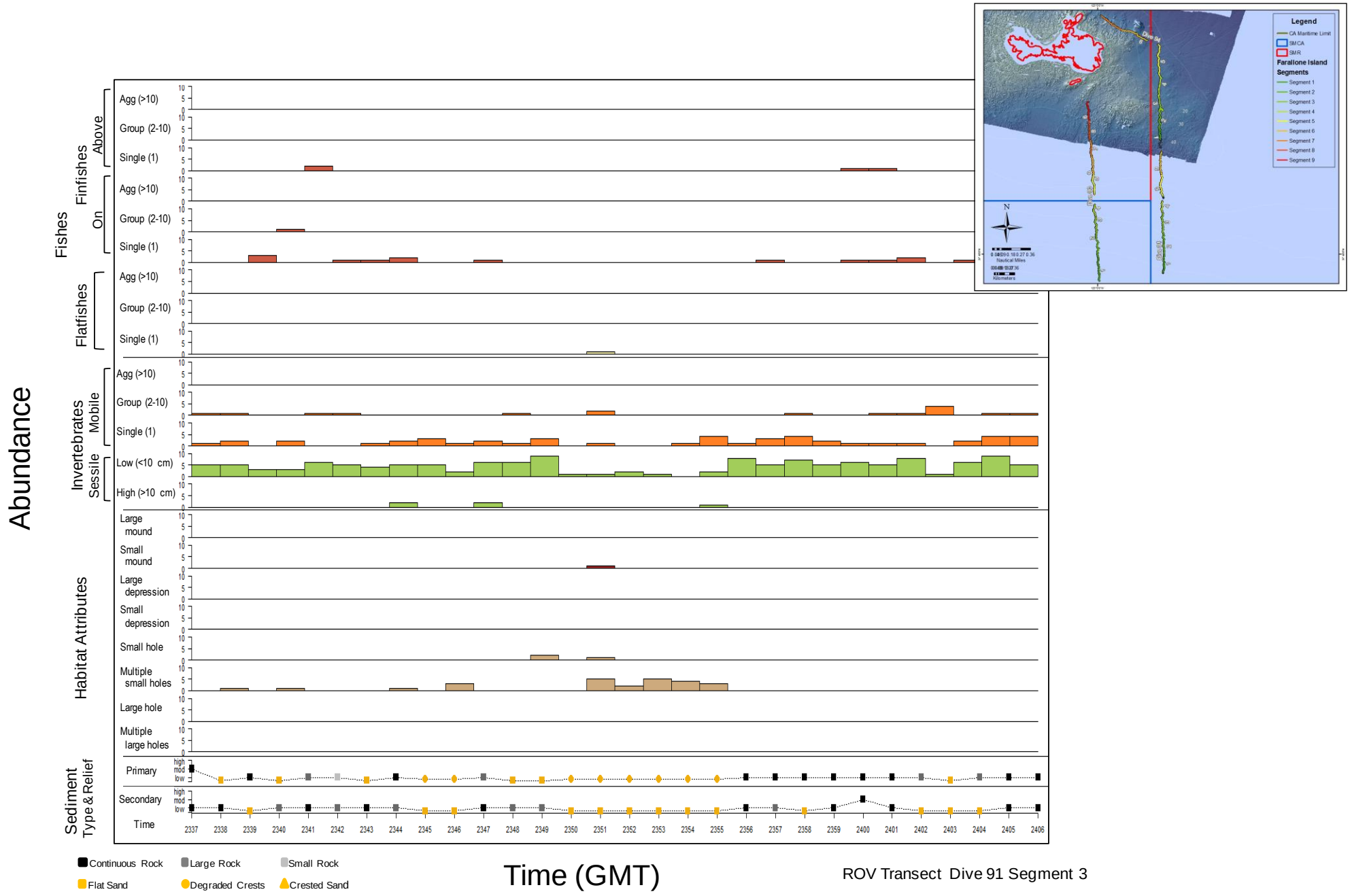

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2337 2338 2339 2340 2341 2342 2343 2344 2345 2346 2347 2348 2349 2350 2351 2352 2353 2354 2355 2356 2357 2358 2359 2400 2401 2402 2403 2404 2405 2406
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 91 Segment 3

Figure 45

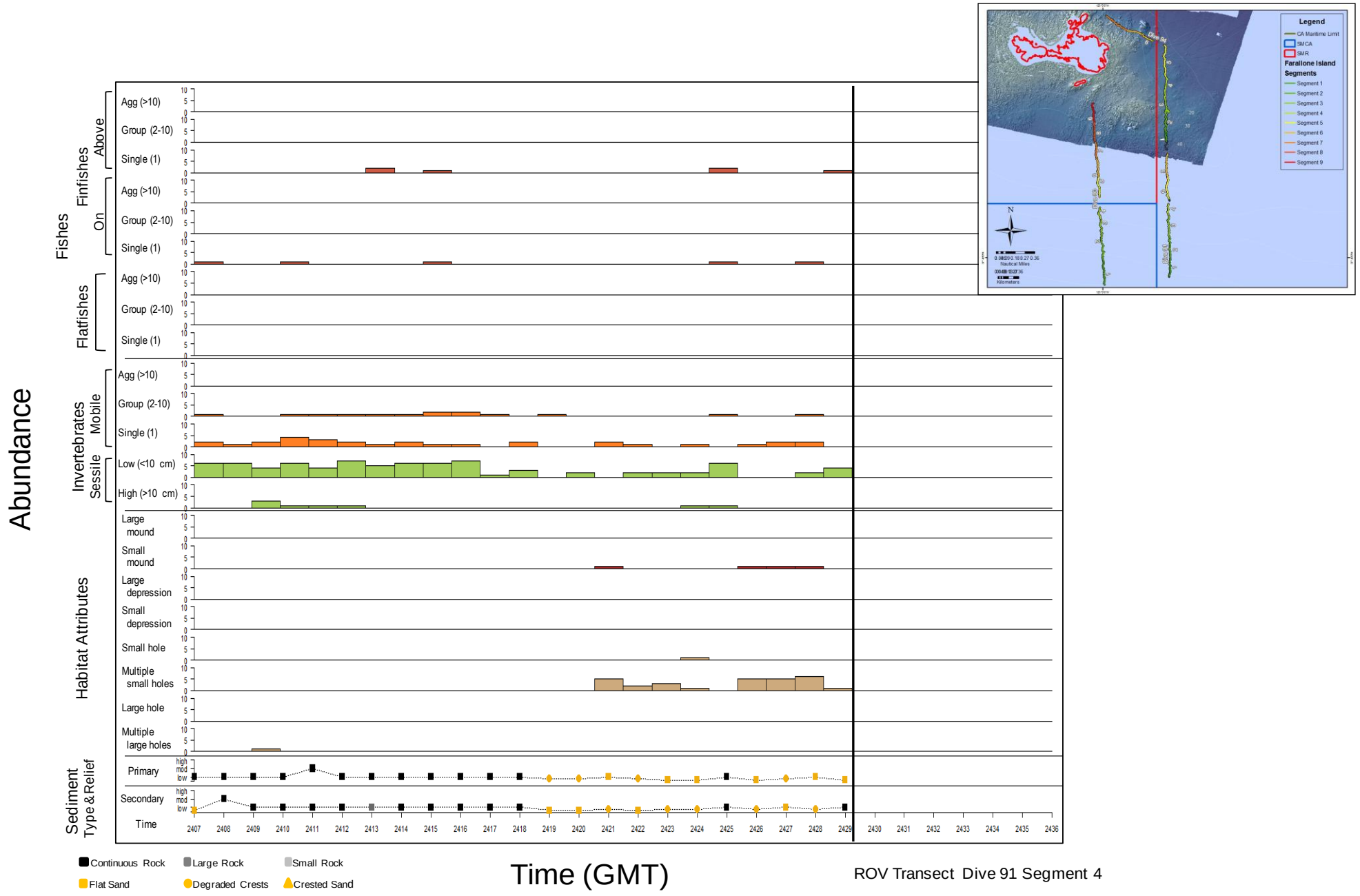

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2407 2408 2409 2410 2411 2412 2413 2414 2415 2416 2417 2418 2419 2420 2421 2422 2423 2424 2425 2426 2427 2428 2429 2430 2431 2432 2433 2434 2435 2436
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
Dive 91
Dive 89
Dive 90
N
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 91 Segment 4

Figure 46

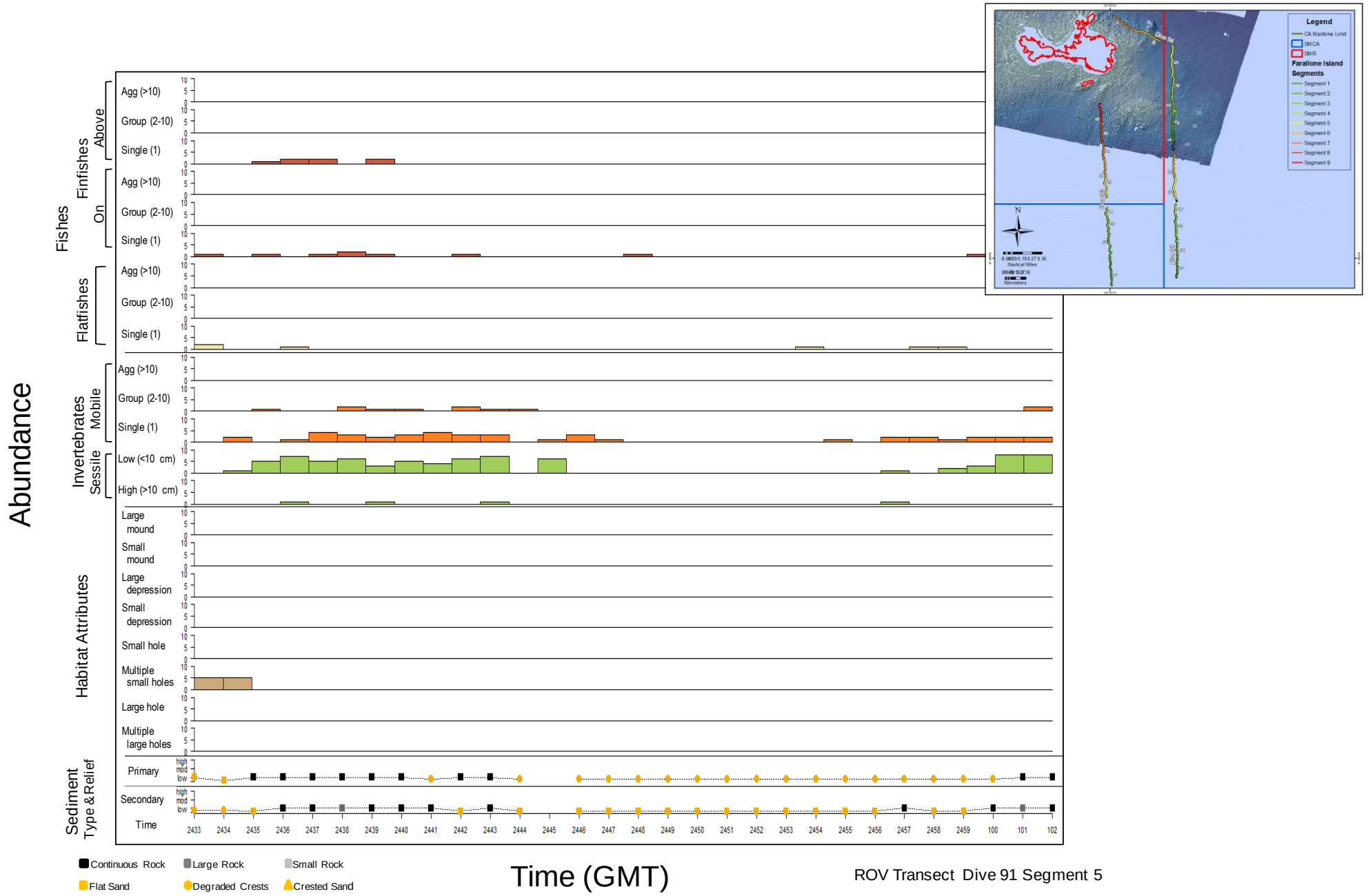

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type &Relief
Primary
Secondary
high
mod
low
Time
2433
2434
2435
2436
2437
2438
2439
2440
2441
2442
2443
2444
2445
2446
2447
2448
2449
2450
2451
2452
2453
2454
2455
2456
2457
2458
2459
100
101
102
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 91 Segment 5

Figure 47

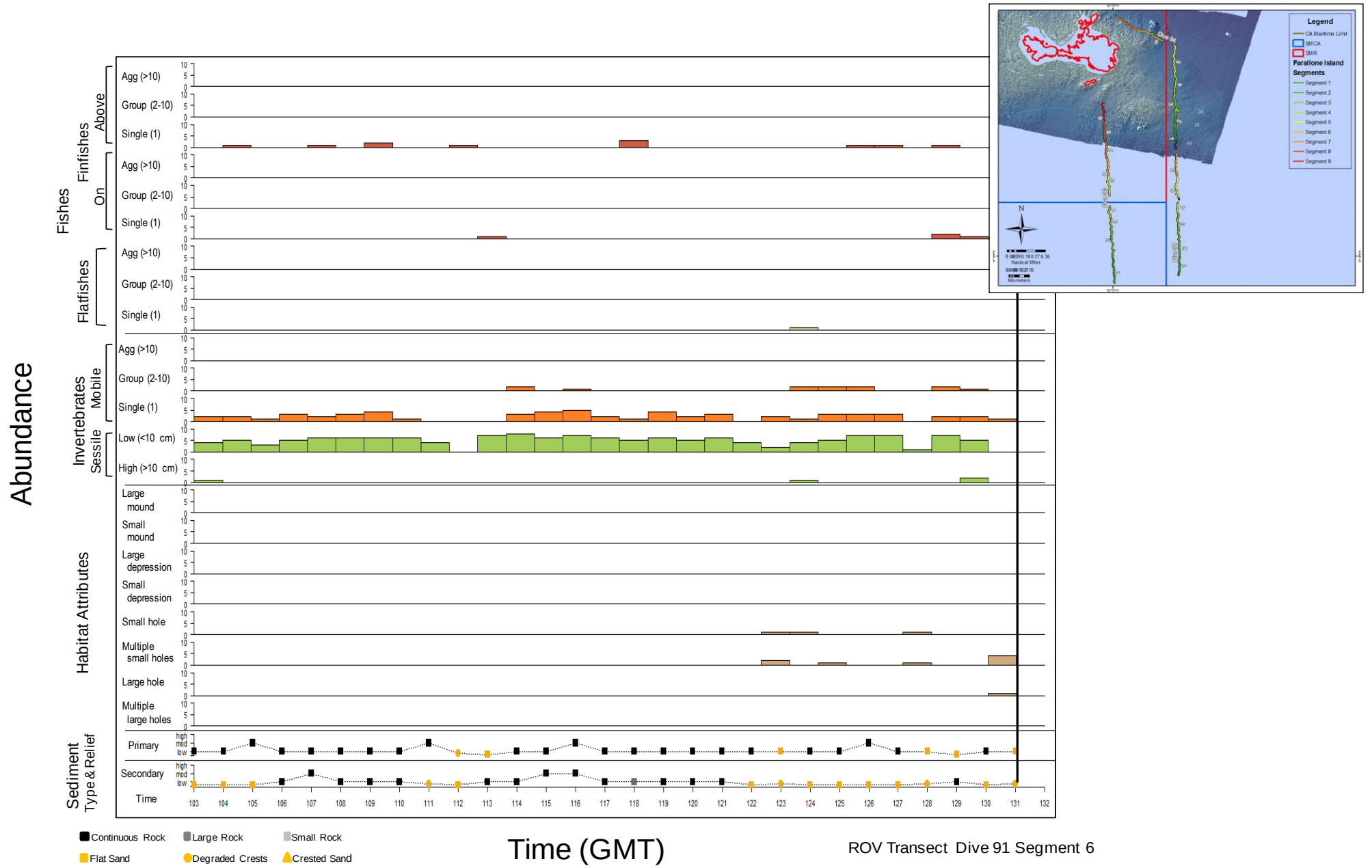

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 91 Segment 6

Figure 48

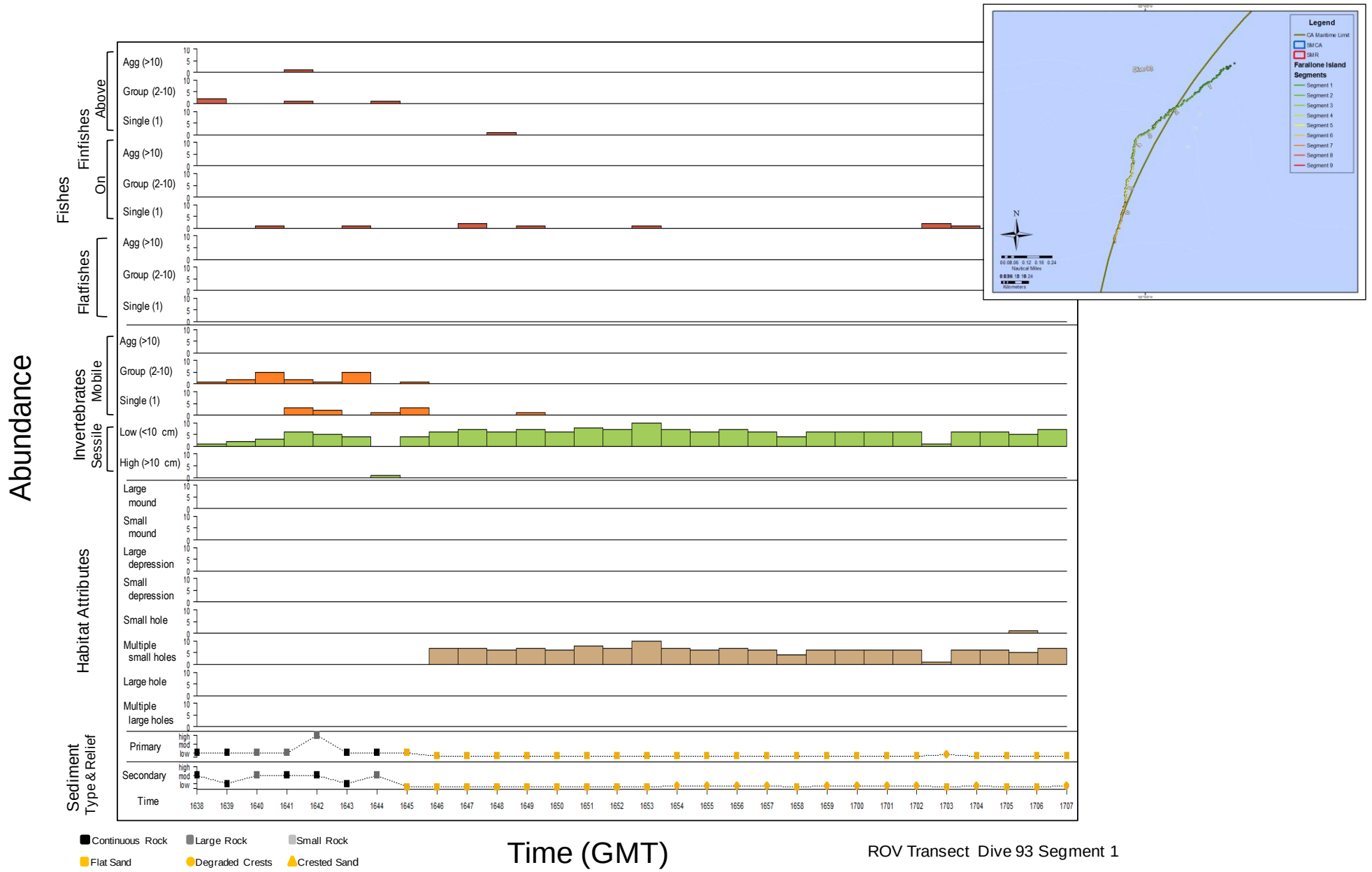

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
1638 1639 1640 1641 1642 1643 1644 1645 1646 1647 1648 1649 1650 1651 1652 1653 1654 1655 1656 1657 1658 1659 1700 1701 1702 1703 1704 1705 1706 1707
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Nautical Miles
Kilometers
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 93 Segment 1

Figure 49

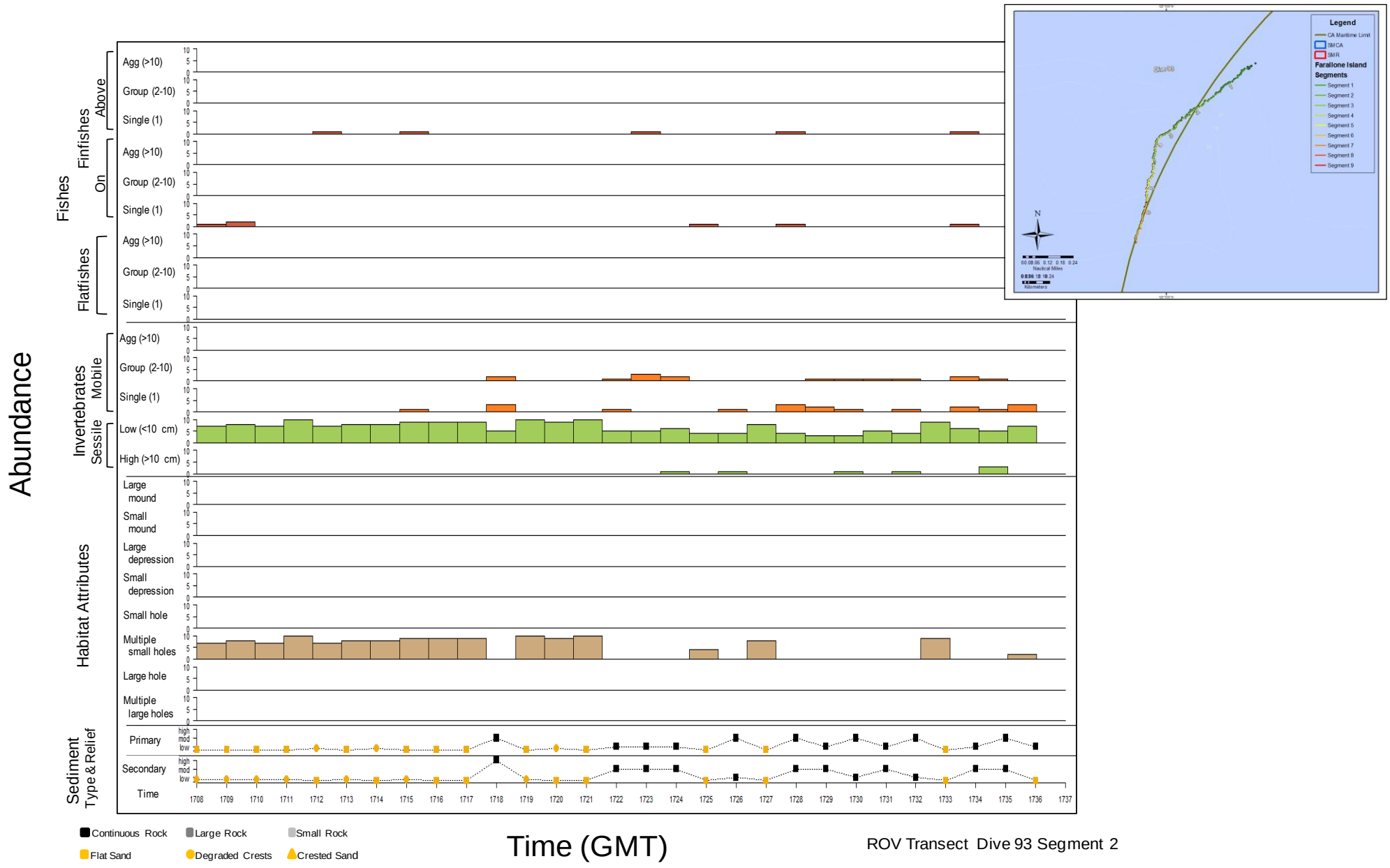

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
1708 1709 1710 1711 1712 1713 1714 1715 1716 1717 1718 1719 1720 1721 1722 1723 1724 1725 1726 1727 1728 1729 1730 1731 1732 1733 1734 1735 1736 1737
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Nautical Miles
Kilometers
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 93 Segment 2

Figure 50

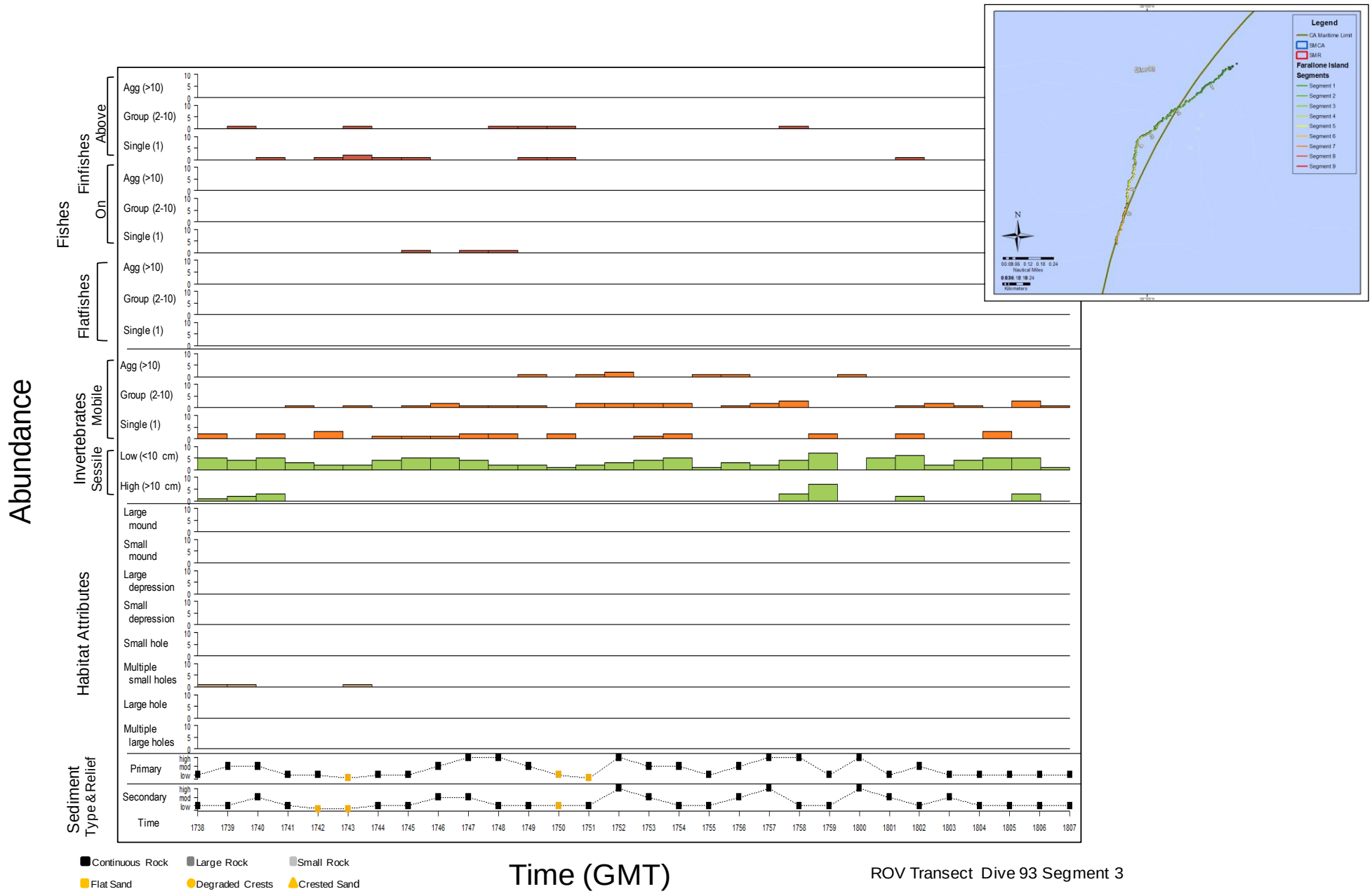

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1738 1739 1740 1741 1742 1743 1744 1745 1746 1747 1748 1749 1750 1751 1752 1753 1754 1755 1756 1757 1758 1759 1800 1801 1802 1803 1804 1805 1806 1807
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 93 Segment 3

Figure 51

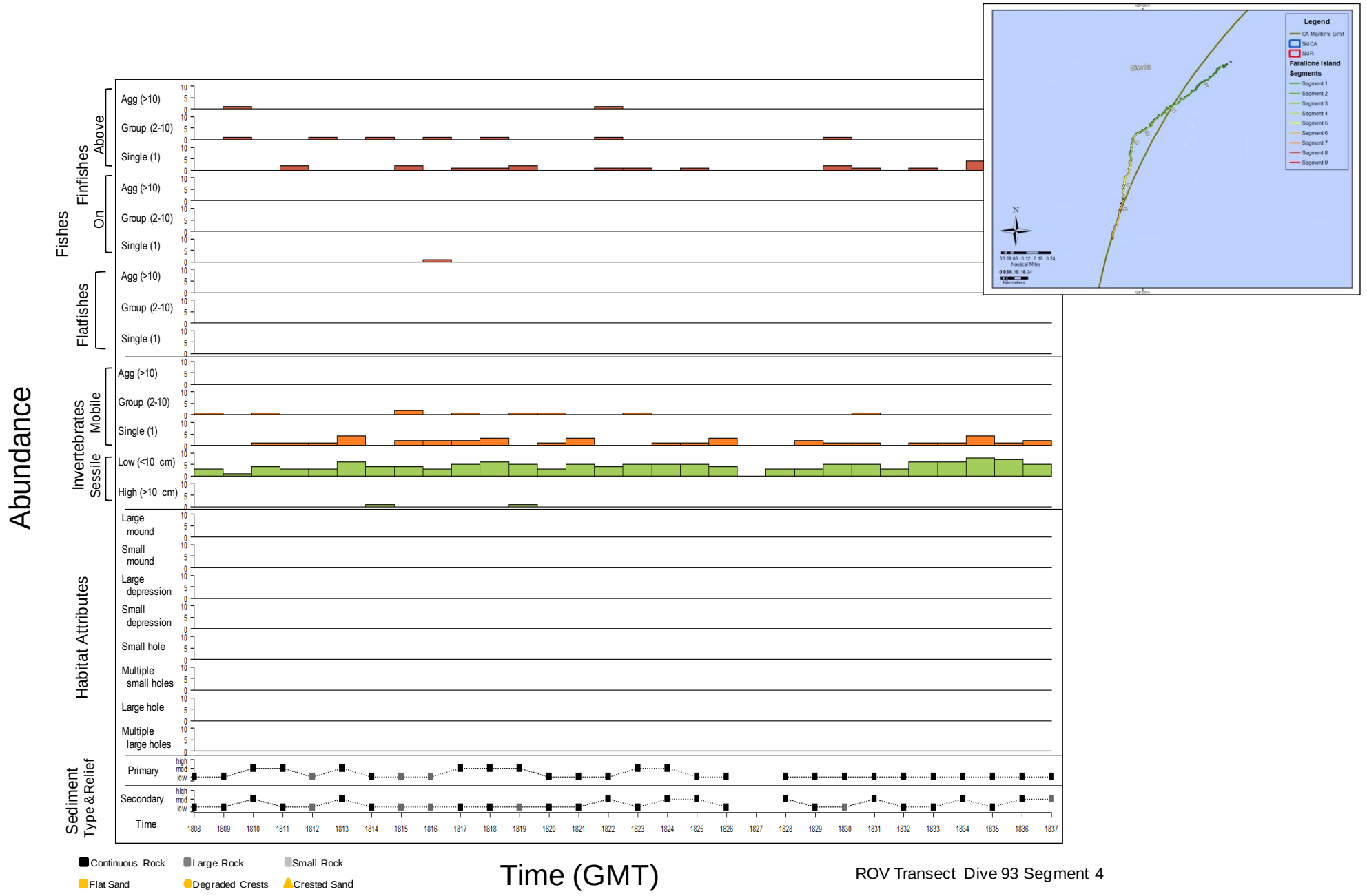

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
1808 1809 1810 1811 1812 1813 1814 1815 1816 1817 1818 1819 1820 1821 1822 1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Nautical Miles
Kilometers
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 93 Segment 4

Figure 52

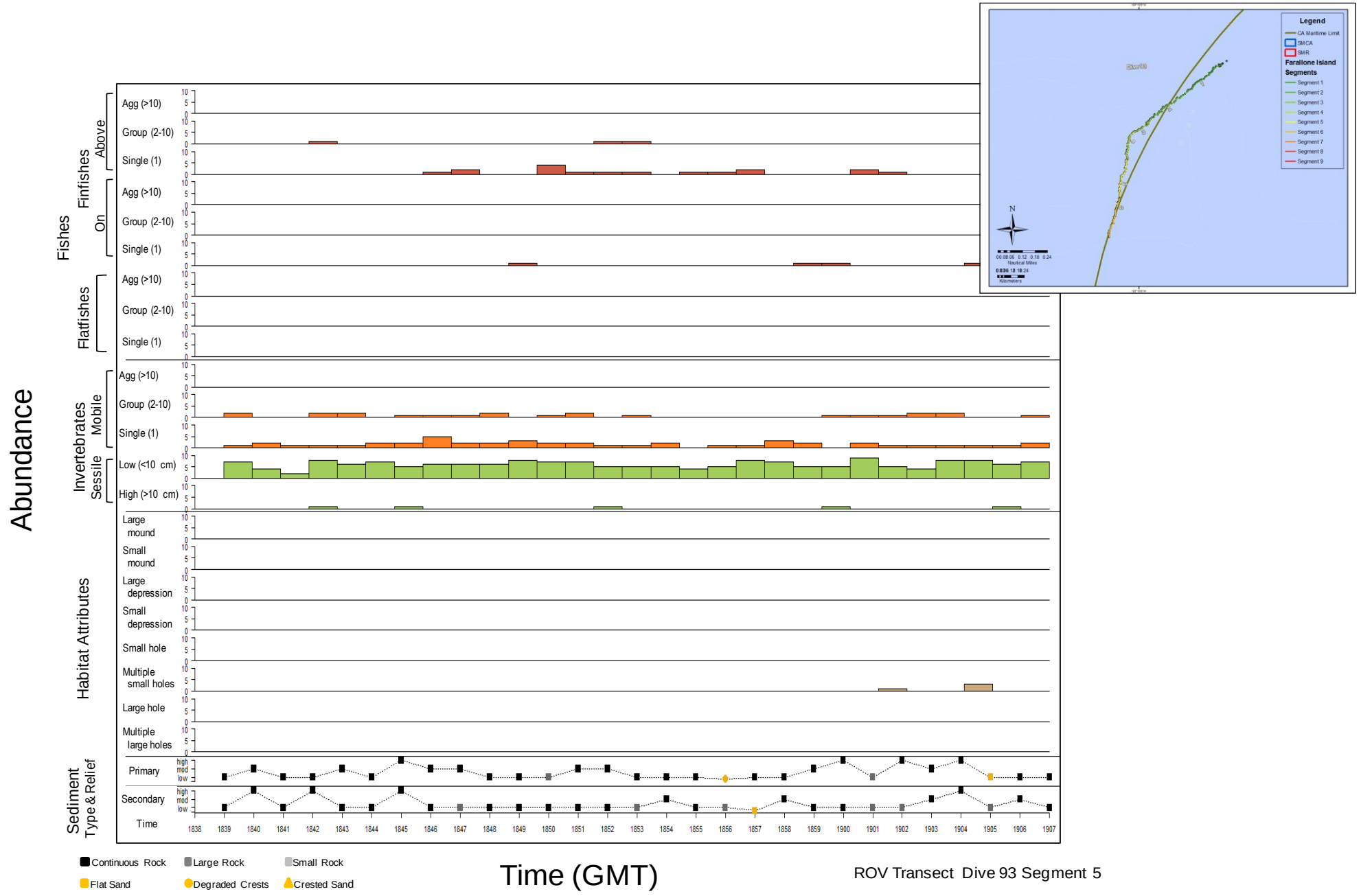

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
1838 1839 1840 1841 1842 1843 1844 1845 1846 1847 1848 1849 1850 1851 1852 1853 1854 1855 1856 1857 1858 1859 1900 1901 1902 1903 1904 1905 1906 1907
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Nautical Miles
Kilometers
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 93 Segment 5

Figure 53

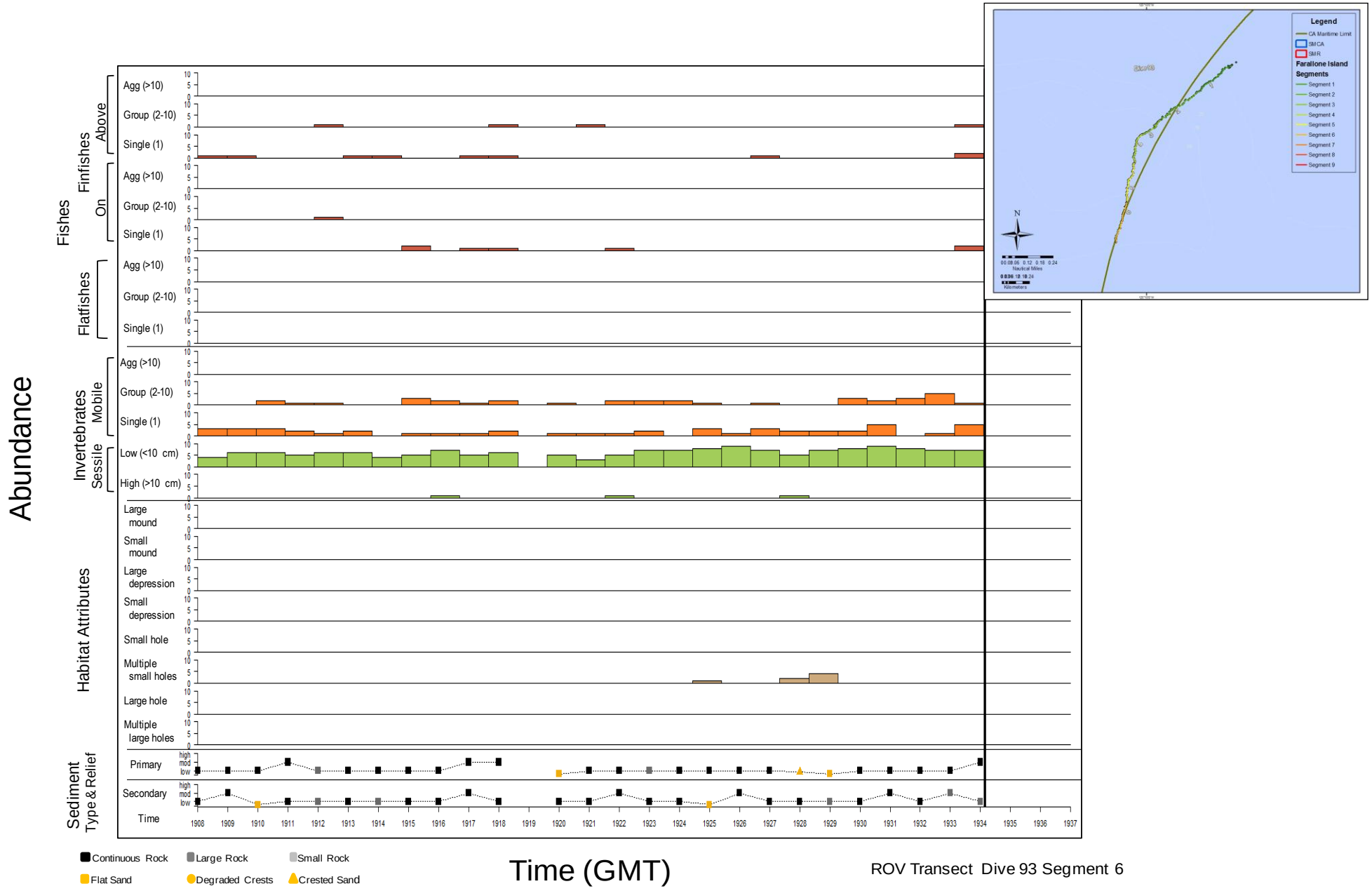

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
1908 1909 1910 1911 1912 1913 1914 1915 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 93 Segment 6

Figure 54

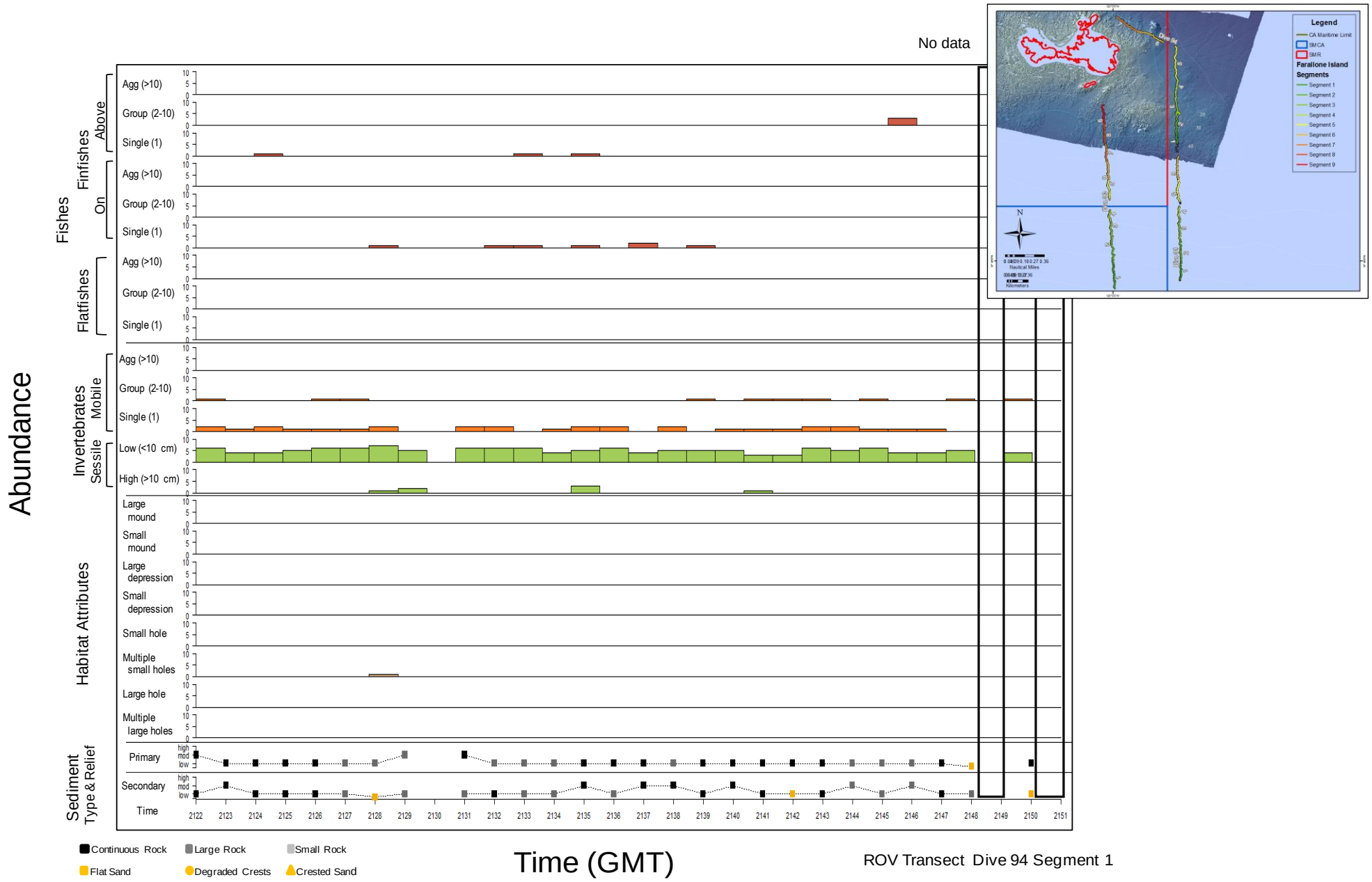

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
2122 2123 2124 2125 2126 2127 2128 2129 2130 2131 2132 2133 2134 2135 2136 2137 2138 2139 2140 2141 2142 2143 2144 2145 2146 2147 2148 2149 2150 2151
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 94 Segment 1

Figure 55

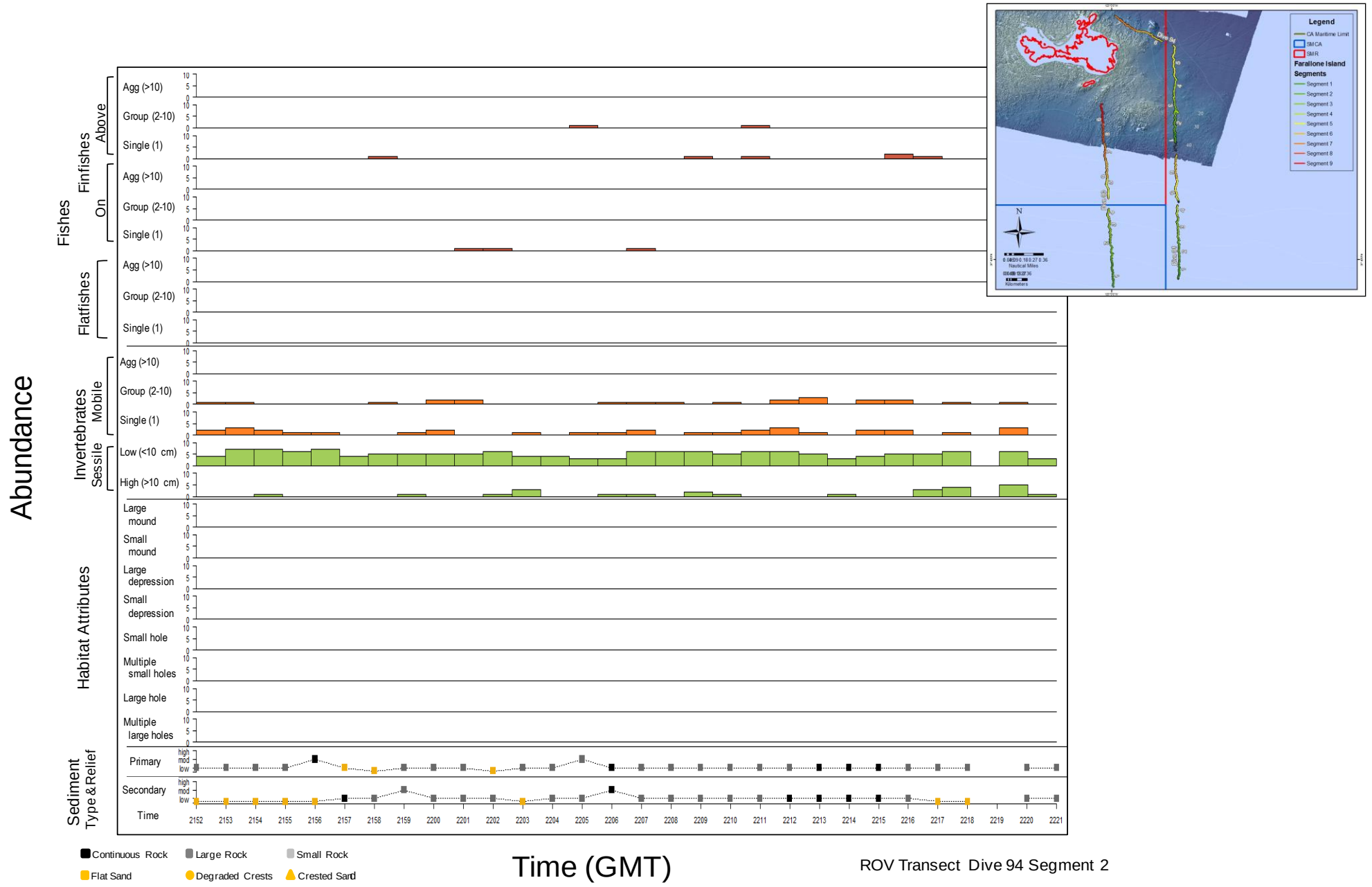

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2152 2153 2154 2155 2156 2157 2158 2159 2200 2201 2202 2203 2204 2205 2206 2207 2208 2209 2210 2211 2212 2213 2214 2215 2216 2217 2218 2219 2220 2221
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 94 Segment 2

Figure 56

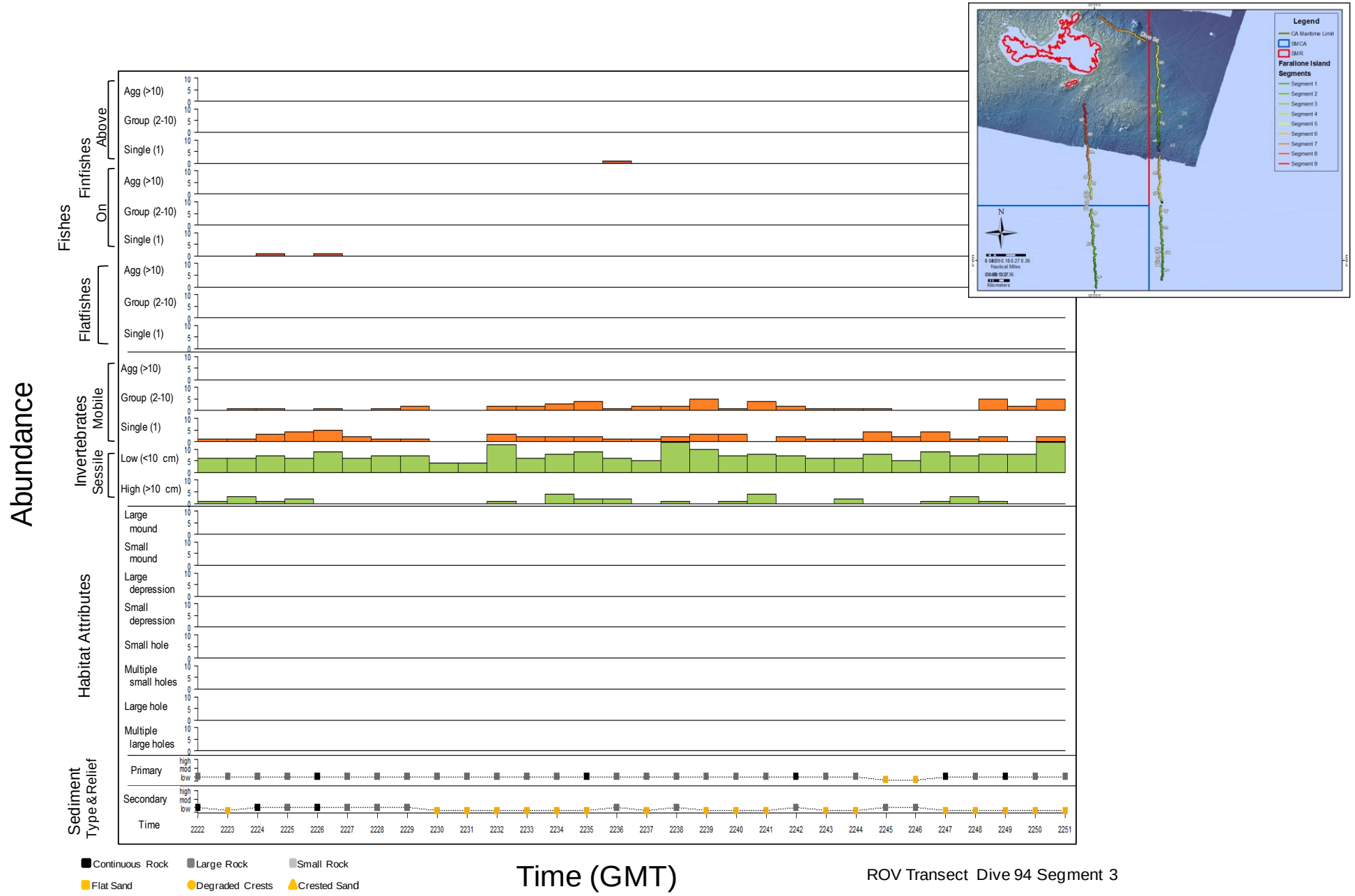

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
2222 2223 2224 2225 2226 2227 2228 2229 2230 2231 2232 2233 2234 2235 2236 2237 2238 2239 2240 2241 2242 2243 2244 2245 2246 2247 2248 2249 2250 2251
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 94 Segment 3

Figure 57

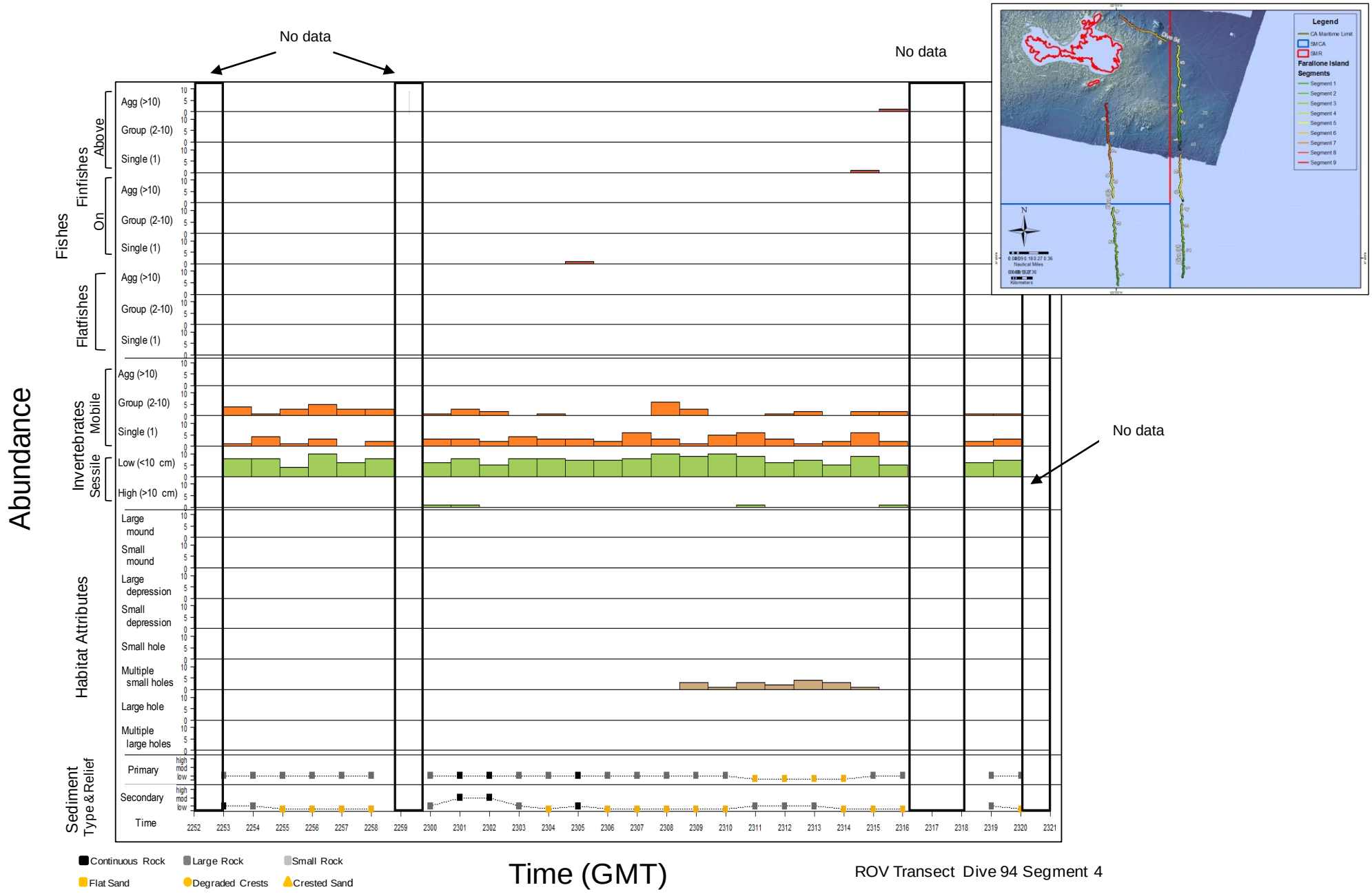

No data
No data
No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
2252 2253 2254 2255 2256 2257 2258 2259 2300 2301 2302 2303 2304 2305 2306 2307 2308 2309 2310 2311 2312 2313 2314 2315 2316 2317 2318 2319 2320 2321
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Nautical Miles
Kilometers
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 94 Segment 4

Figure 58

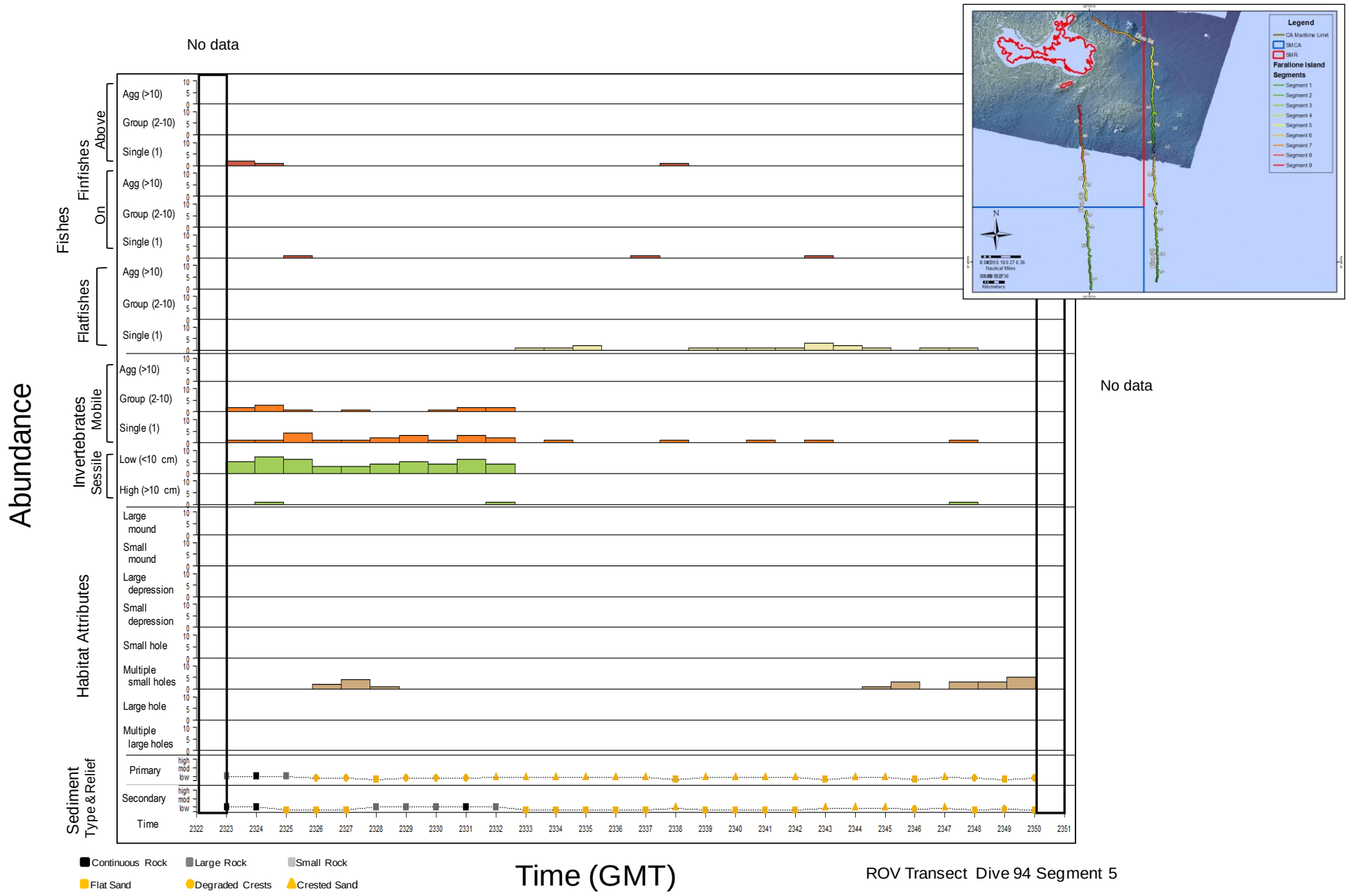

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
2322 2323 2324 2325 2326 2327 2328 2329 2330 2331 2332 2333 2334 2335 2336 2337 2338 2339 2340 2341 2342 2343 2344 2345 2346 2347 2348 2349 2350 2351
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
No data
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 94 Segment 5

Figure 59

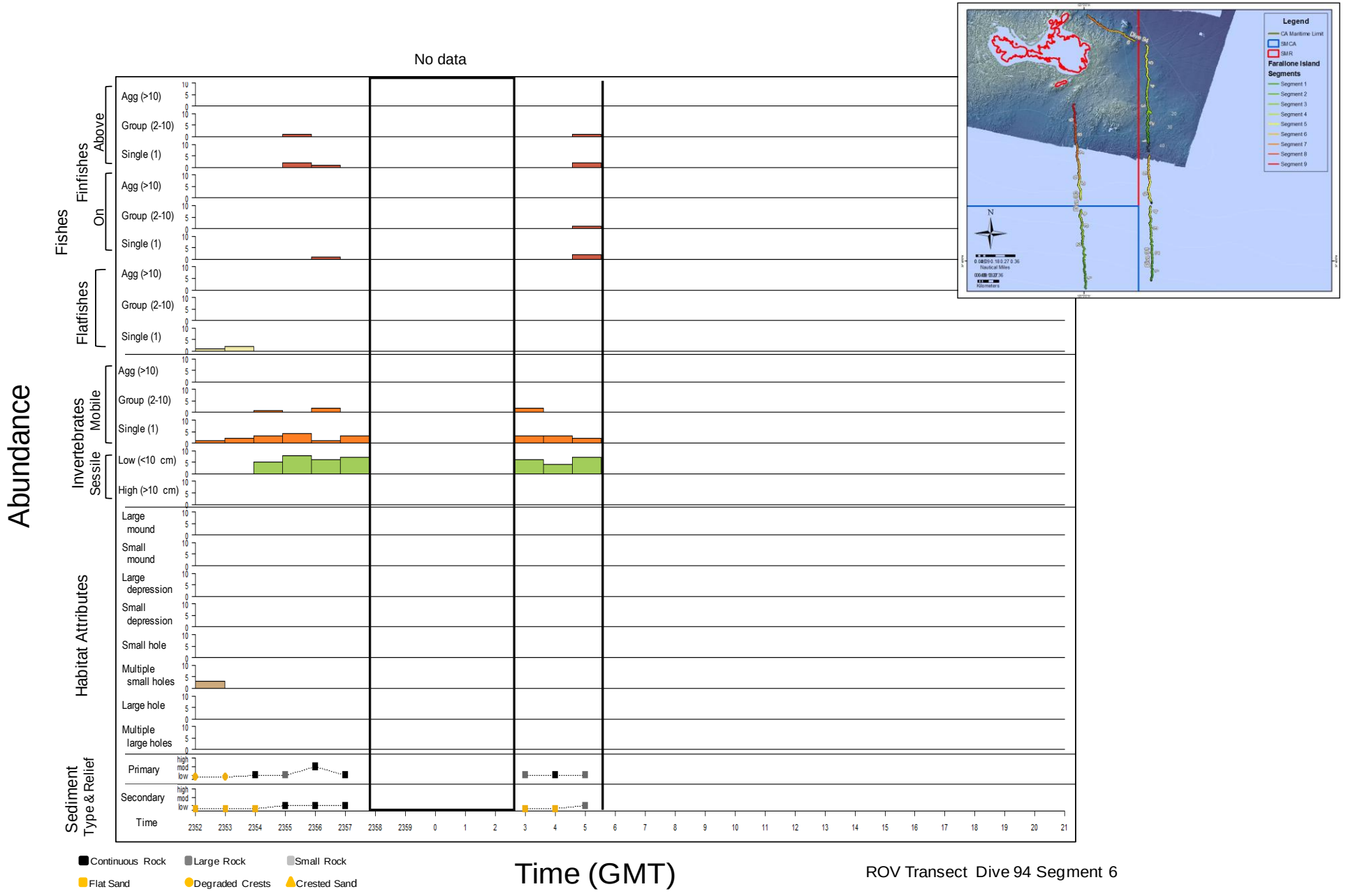

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
2352 2353 2354 2355 2356 2357 2358 2359 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 94 Segment 6

Figure 60

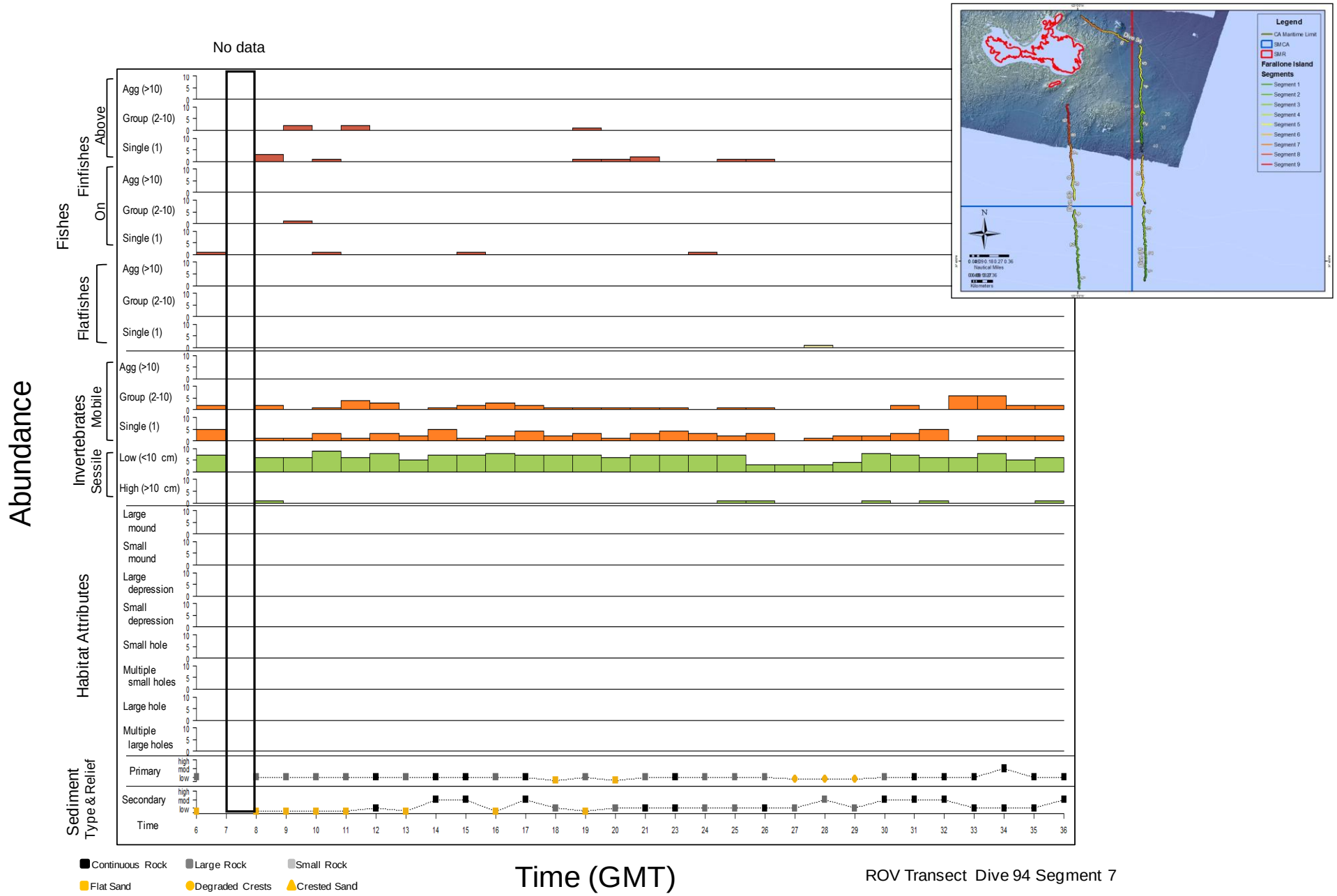

No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 23 24 25 26 27 28 29 30 31 32 33 34 35 36
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 94 Segment 7

Figure 61

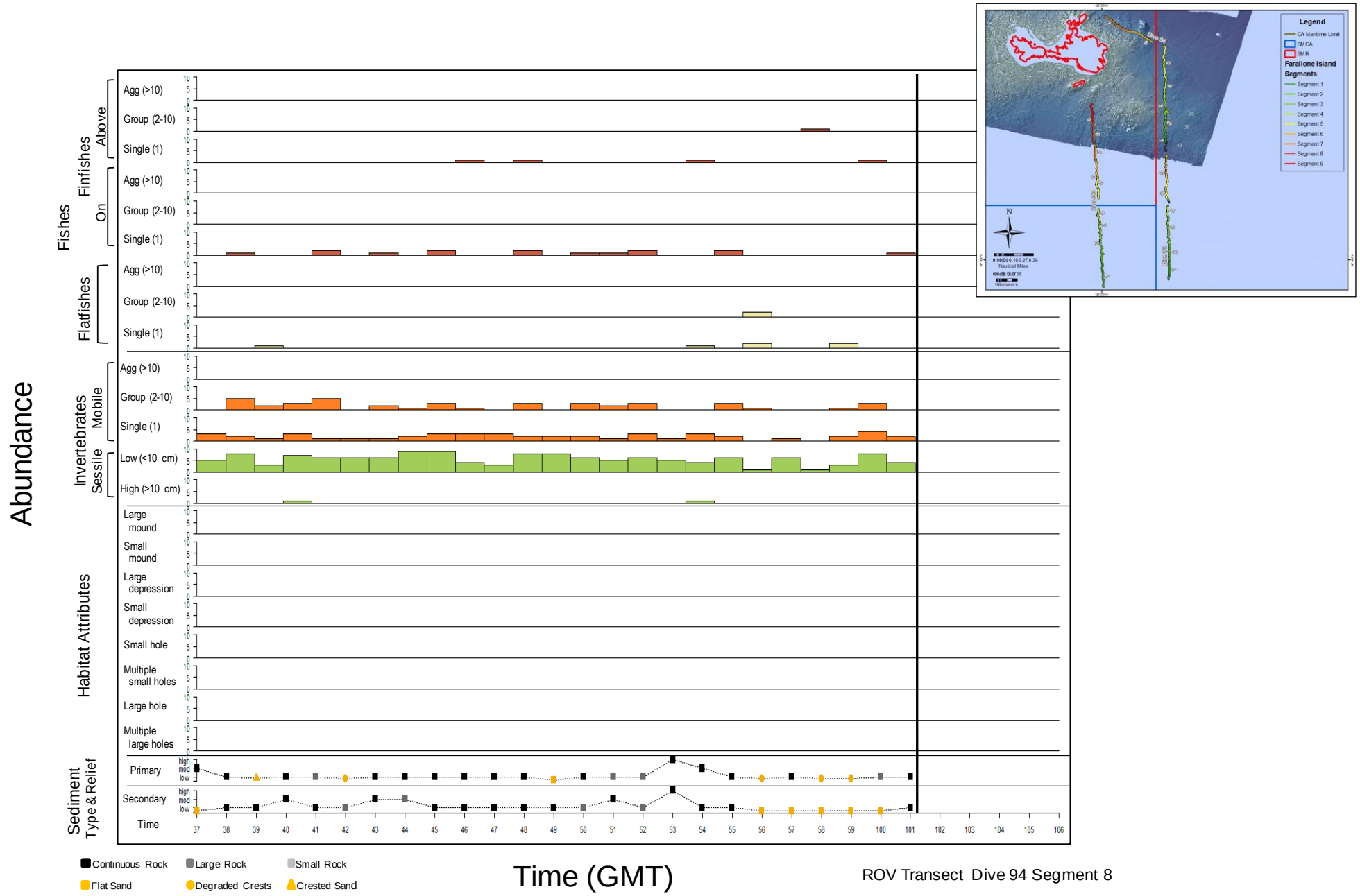

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 100 101 102 103 104 105 106
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 94 Segment 8

Figure 62

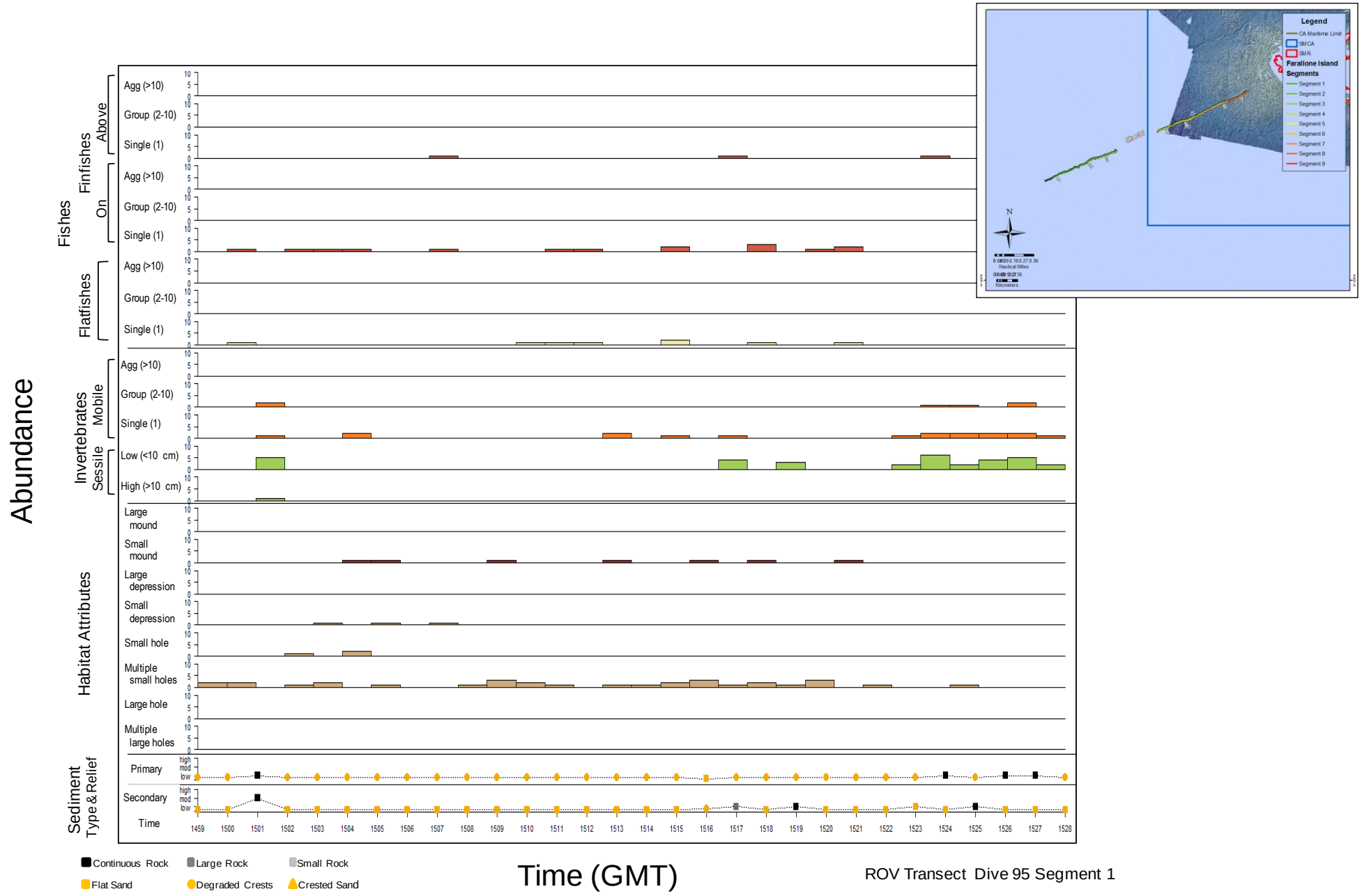

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
1459 1500 1501 1502 1503 1504 1505 1506 1507 1508 1509 1510 1511 1512 1513 1514 1515 1516 1517 1518 1519 1520 1521 1522 1523 1524 1525 1526 1527 1528
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 95 Segment 1

Figure 63

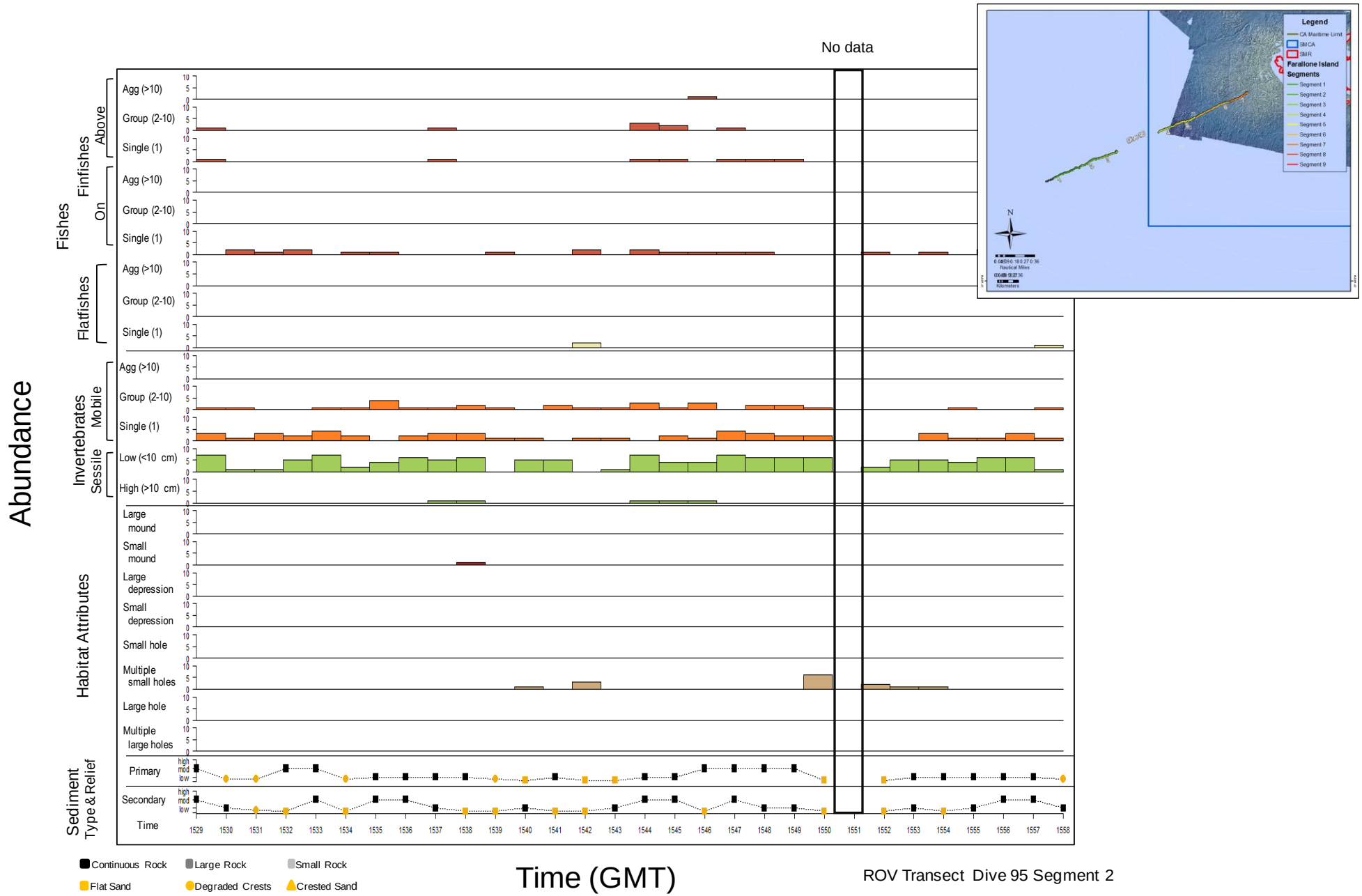

No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
1529 1530 1531 1532 1533 1534 1535 1536 1537 1538 1539 1540 1541 1542 1543 1544 1545 1546 1547 1548 1549 1550 1551 1552 1553 1554 1555 1556 1557 1558
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 95 Segment 2

Figure 64

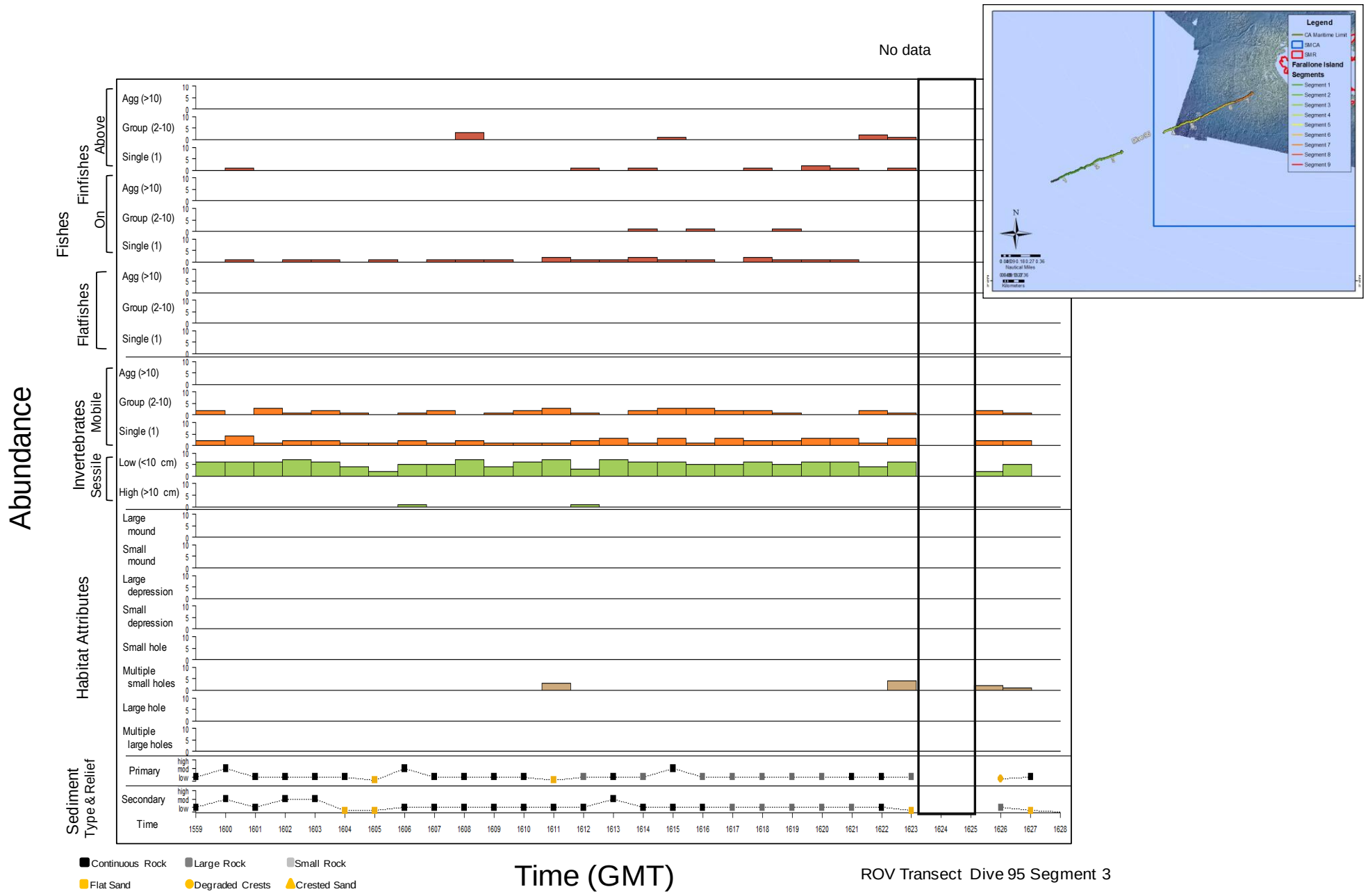

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
1559 1600 1601 1602 1603 1604 1605 1606 1607 1608 1609 1610 1611 1612 1613 1614 1615 1616 1617 1618 1619 1620 1621 1622 1623 1624 1625 1626 1627 1628
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 95 Segment 3

Figure 65

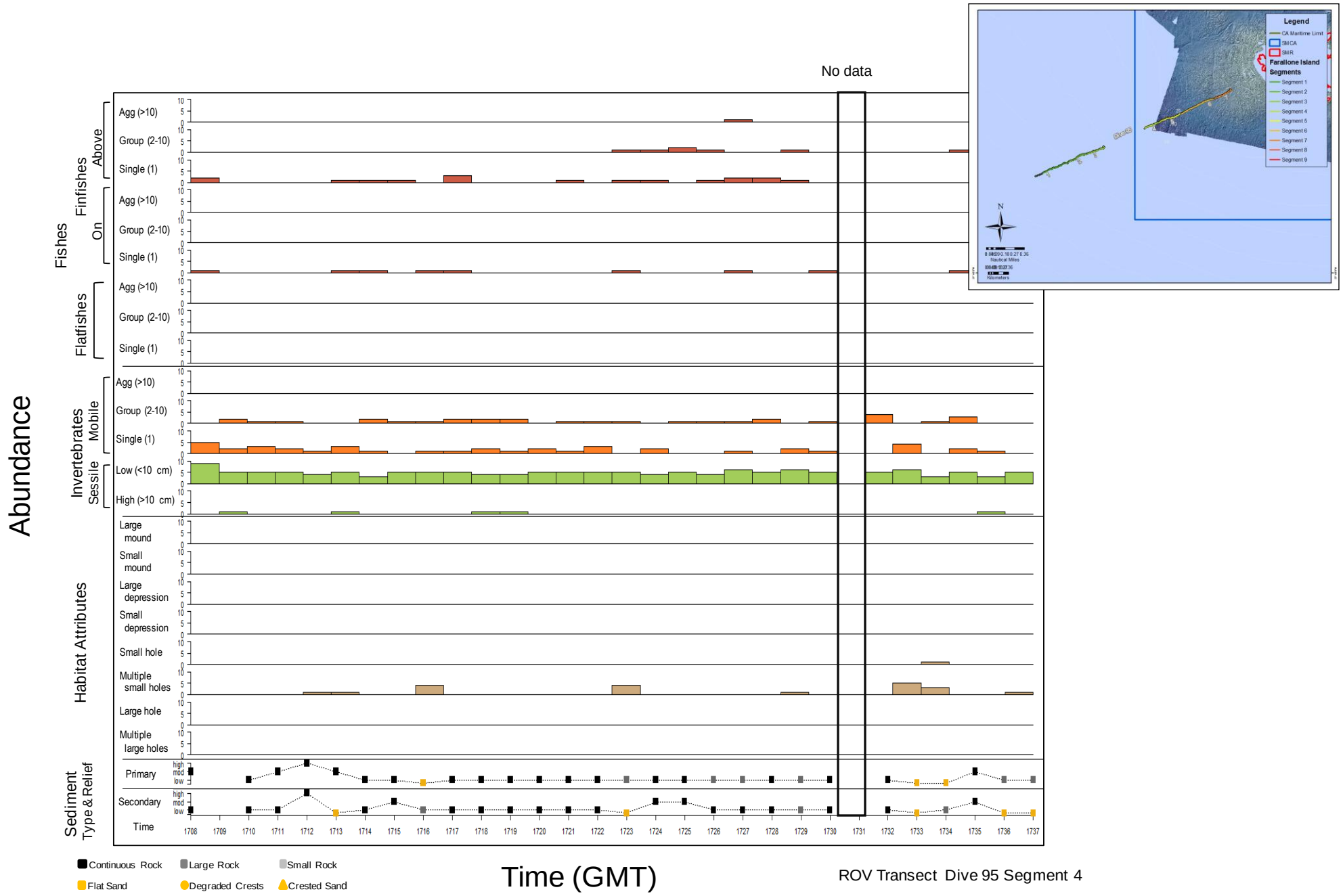

No data
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
1708 1709 1710 1711 1712 1713 1714 1715 1716 1717 1718 1719 1720 1721 1722 1723 1724 1725 1726 1727 1728 1729 1730 1731 1732 1733 1734 1735 1736 1737
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 95 Segment 4

Figure 66

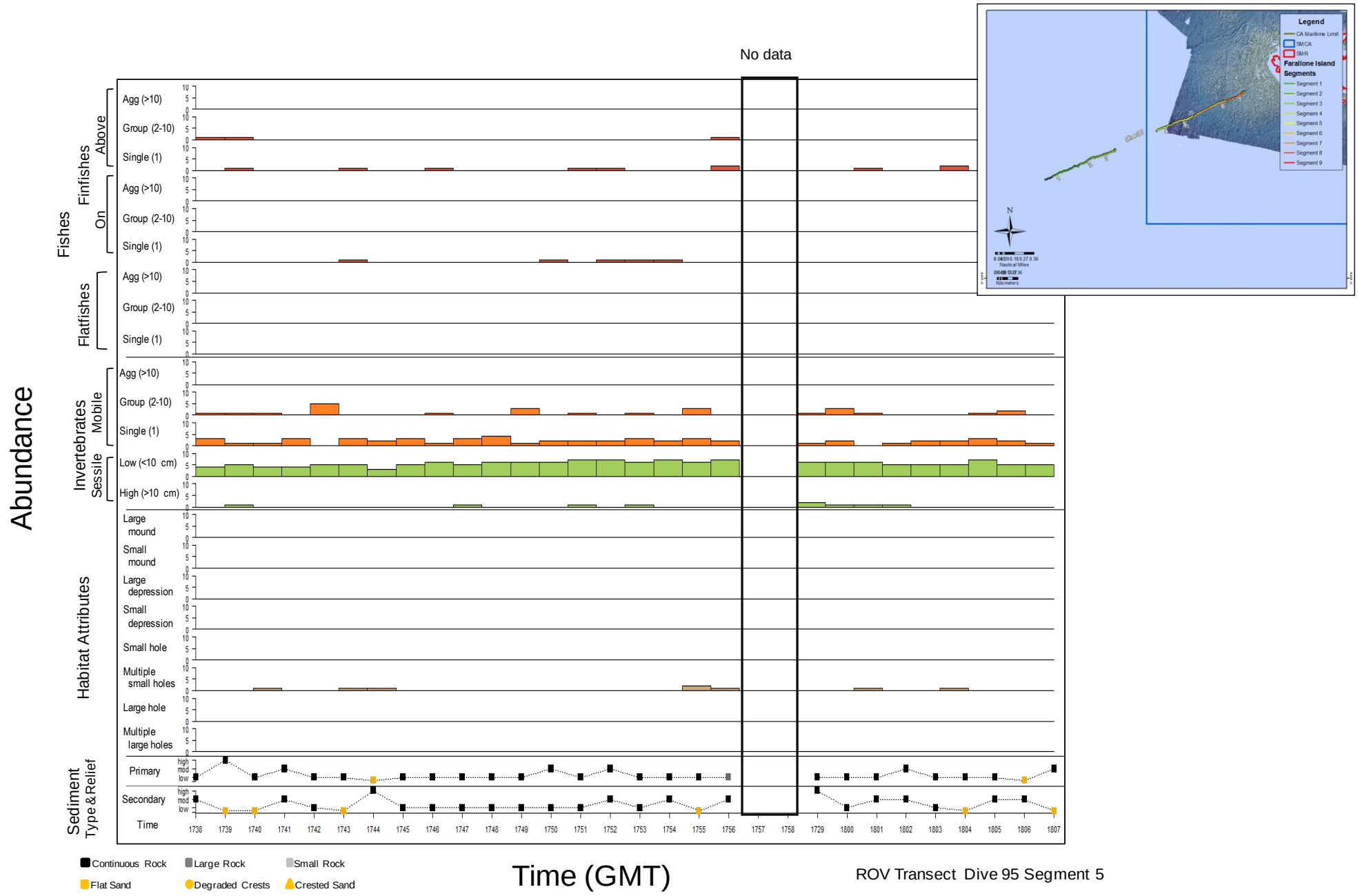

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1738 1739 1740 1741 1742 1743 1744 1745 1746 1747 1748 1749 1750 1751 1752 1753 1754 1755 1756 1757 1758 1729 1800 1801 1802 1803 1804 1805 1806 1807
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 95 Segment 5

Figure 67

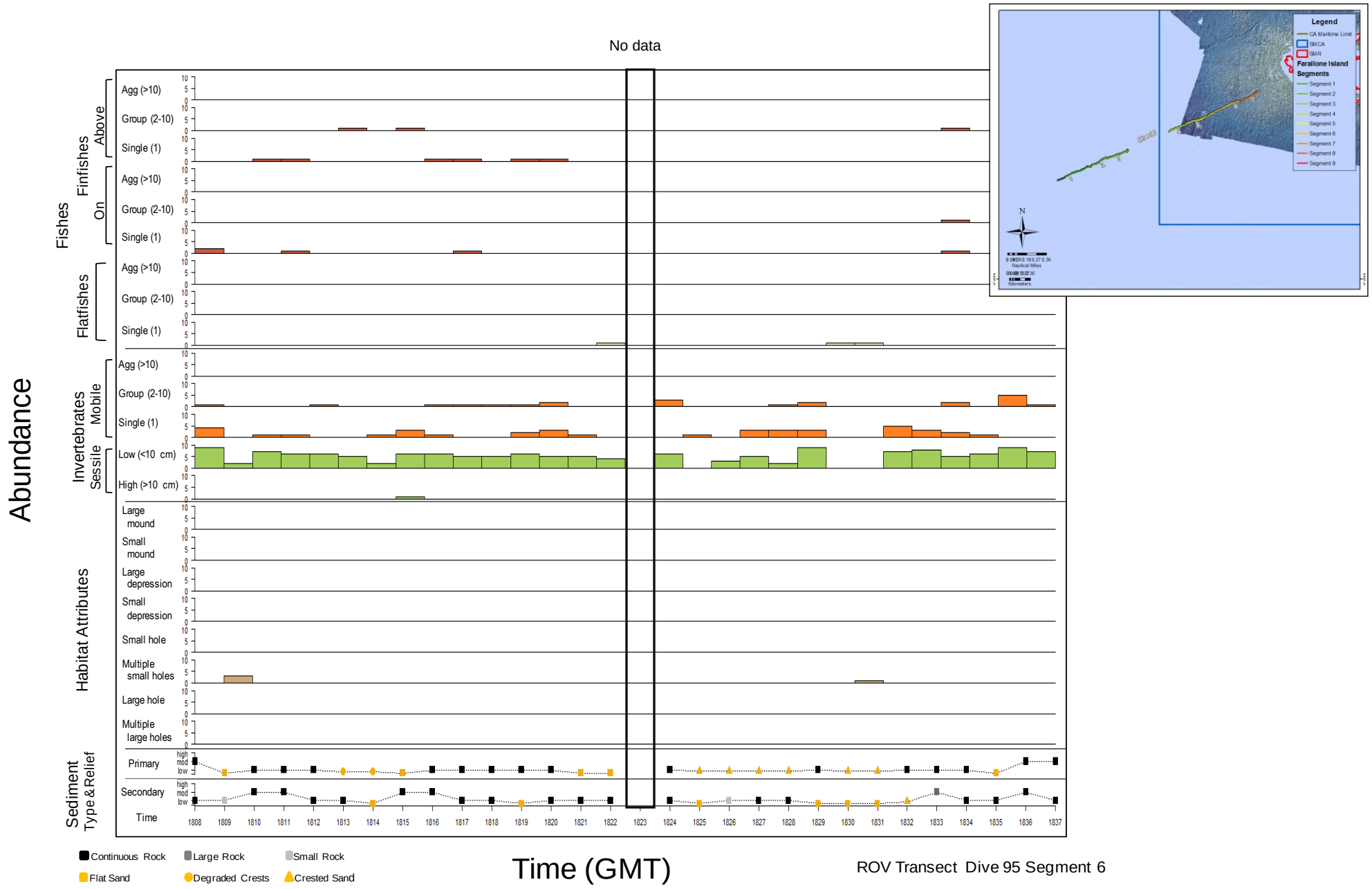

No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1808 1809 1810 1811 1812 1813 1814 1815 1816 1817 1818 1819 1820 1821 1822 1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Nautical Miles
Kilometers
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 95 Segment 6

Figure 68

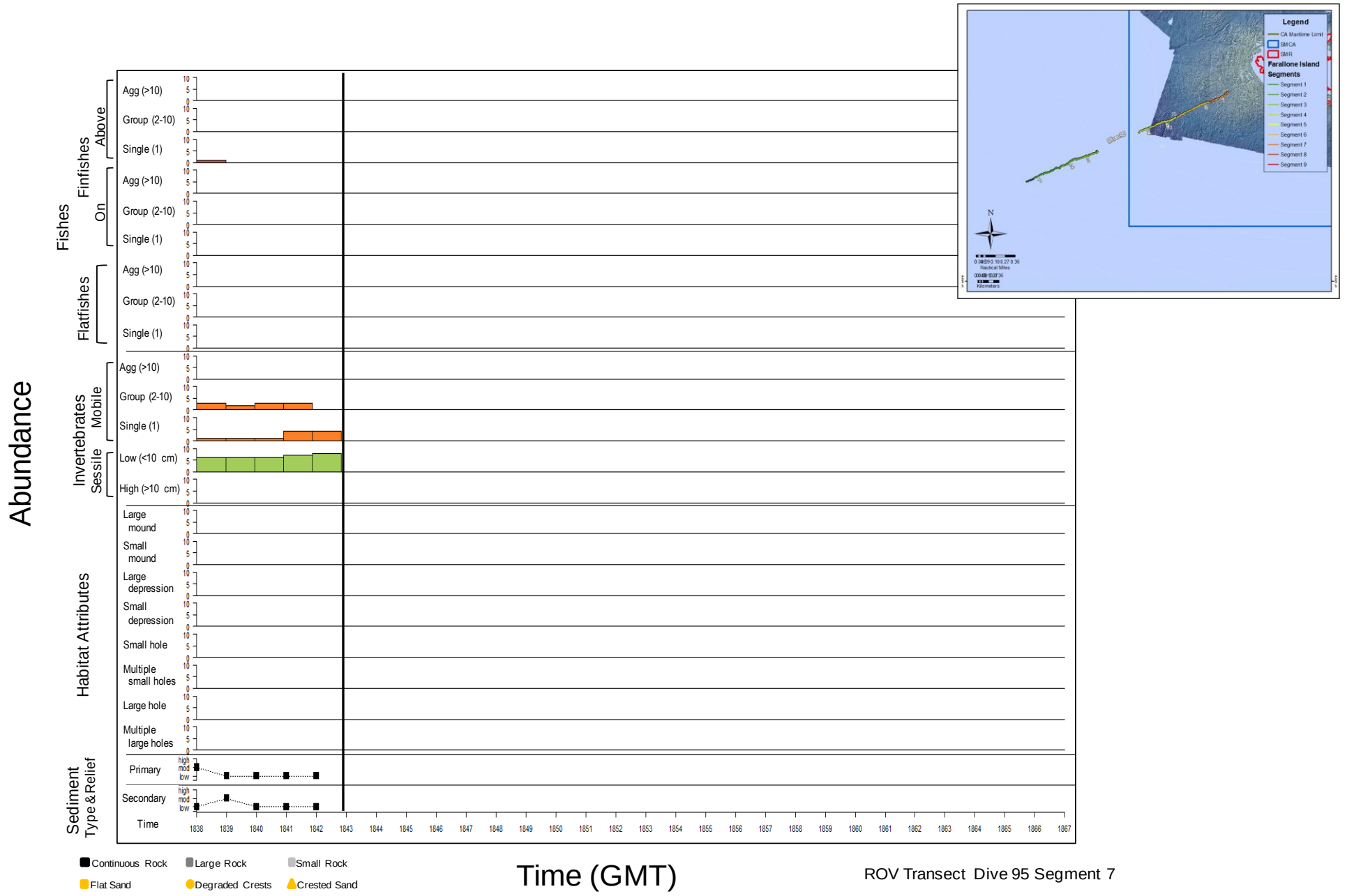

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1838 1839 1840 1841 1842 1843 1844 1845 1846 1847 1848 1849 1850 1851 1852 1853 1854 1855 1856 1857 1858 1859 1860 1861 1862 1863 1864 1865 1866 1867
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 95 Segment 7

Figure 69

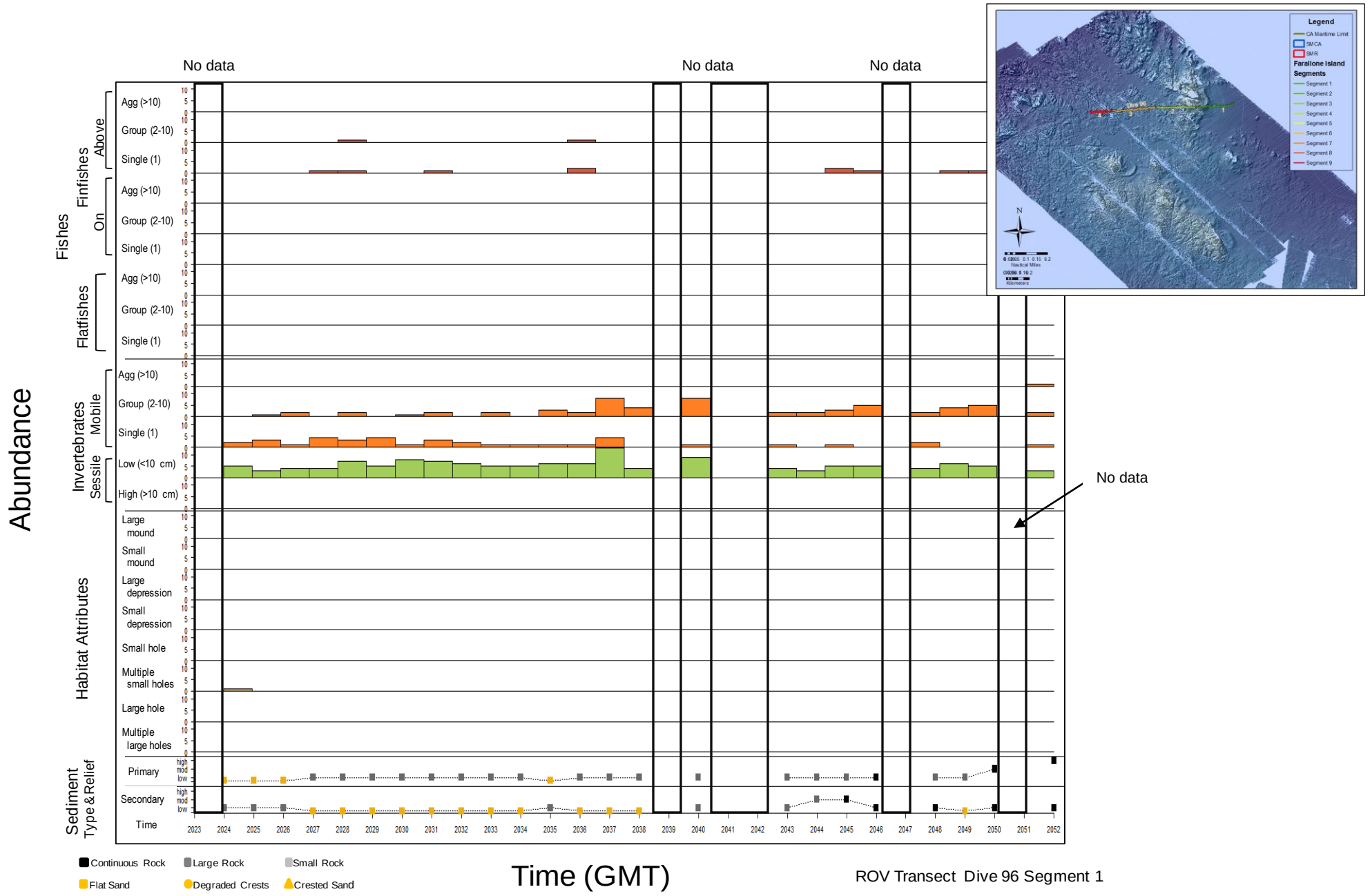

No data
No data
No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038
2039
2040
2041
2042
2043
2044
2045
2046
2047
2048
2049
2050
2051
2052
No data
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 96 Segment 1

Figure 70

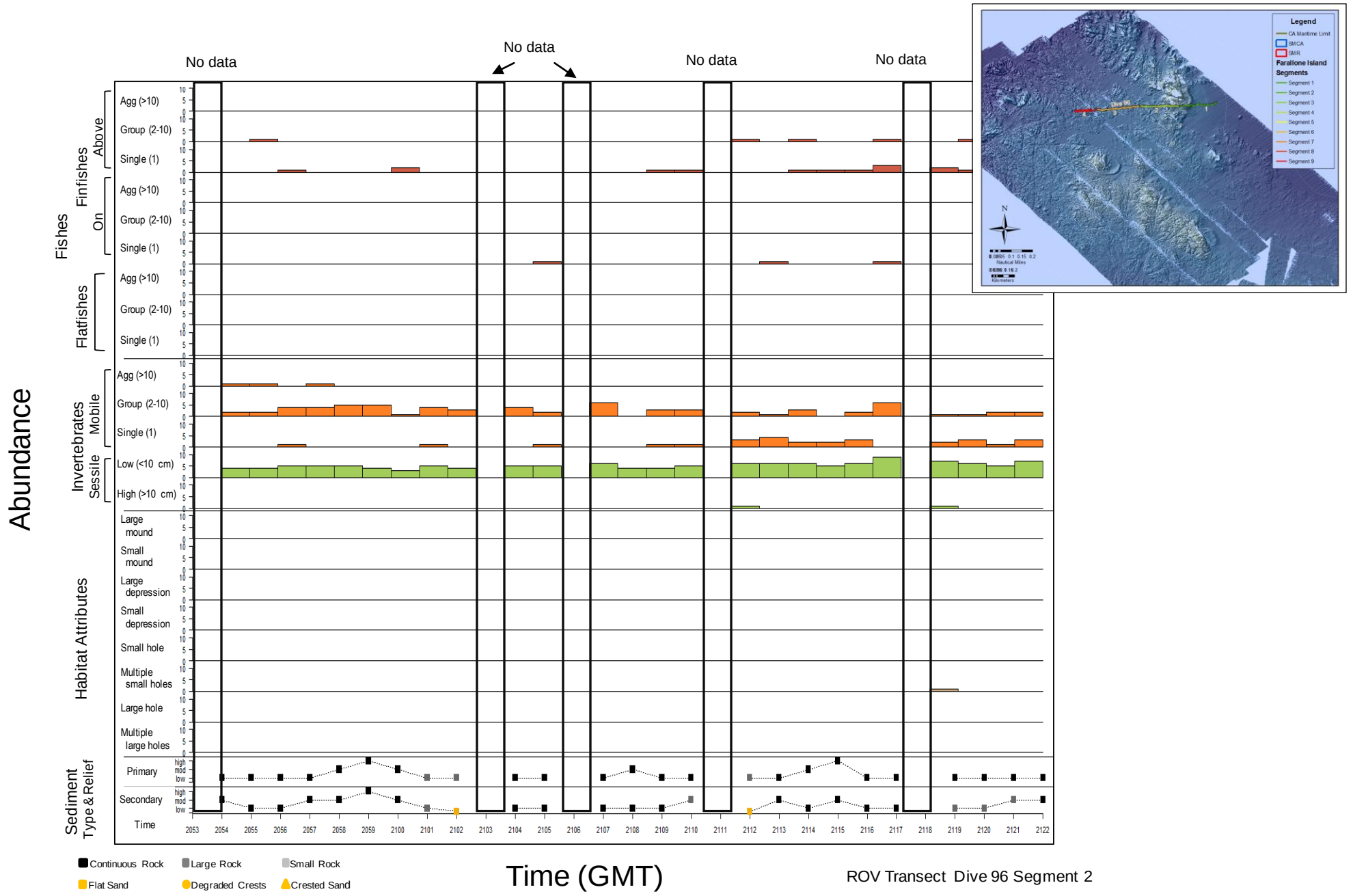

No data
No data
No data
No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
2053
2054
2055
2056
2057
2058
2059
2100
2101
2102
2103
2104
2105
2106
2107
2108
2109
2110
2111
2112
2113
2114
2115
2116
2117
2118
2119
2120
2121
2122
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 96 Segment 2

Figure 71

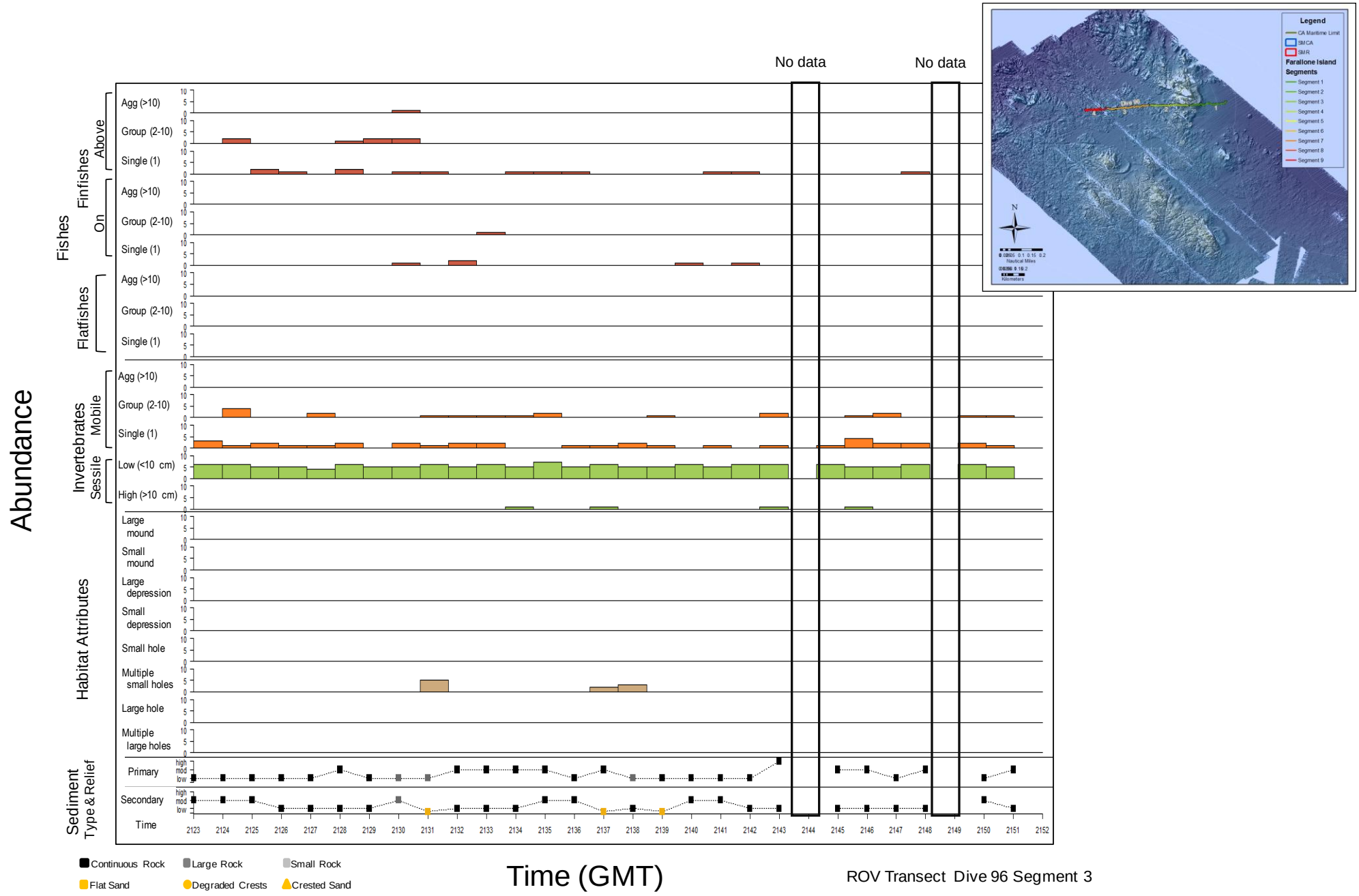

No data
No data
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
2123
2124
2125
2126
2127
2128
2129
2130
2131
2132
2133
2134
2135
2136
2137
2138
2139
2140
2141
2142
2143
2144
2145
2146
2147
2148
2149
2150
2151
2152
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 96 Segment 3

Figure 72

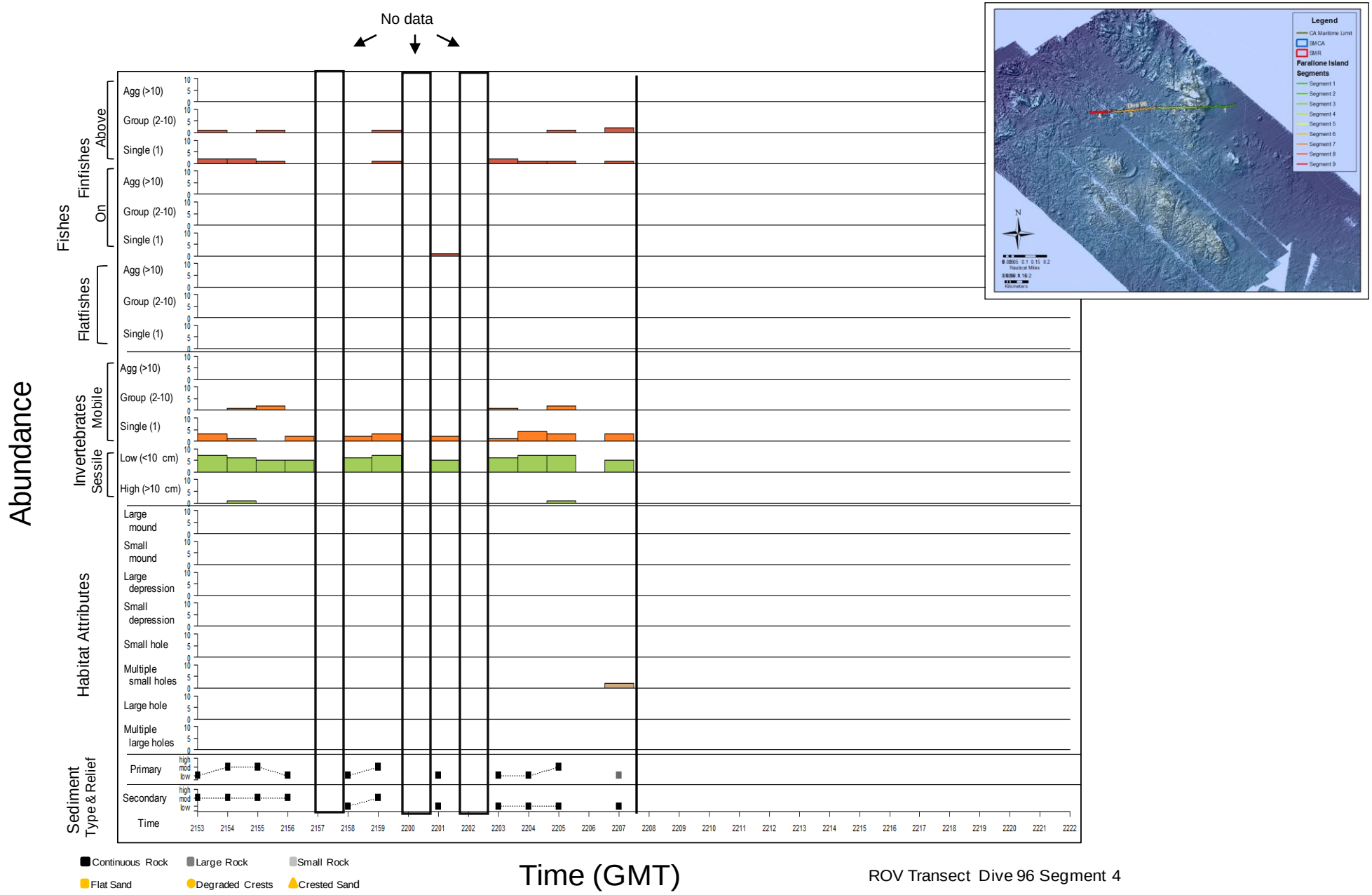

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
2153 2154 2155 2156 2157 2158 2159 2200 2201 2202 2203 2204 2205 2206 2207 2208 2209 2210 2211 2212 2213 2214 2215 2216 2217 2218 2219 2220 2221 2222
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
Dive 96
N
Nautical Miles
Kilometers
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 96 Segment 4

Figure 73

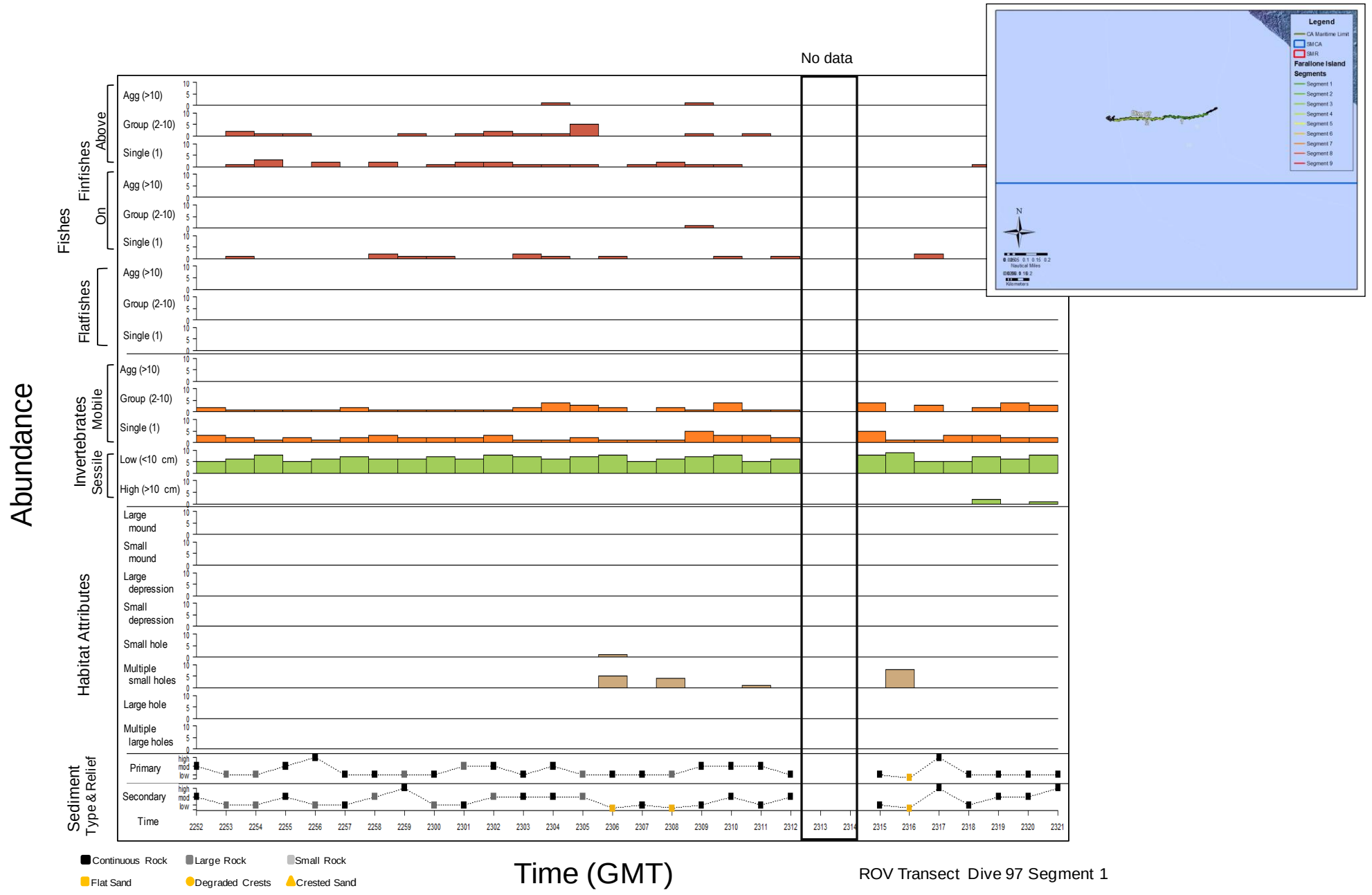

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2252 2253 2254 2255 2256 2257 2258 2259 2300 2301 2302 2303 2304 2305 2306 2307 2308 2309 2310 2311 2312 2313 2314 2315 2316 2317 2318 2319 2320 2321
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Nautical Miles
Kilometers
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 97 Segment 1

Figure 74

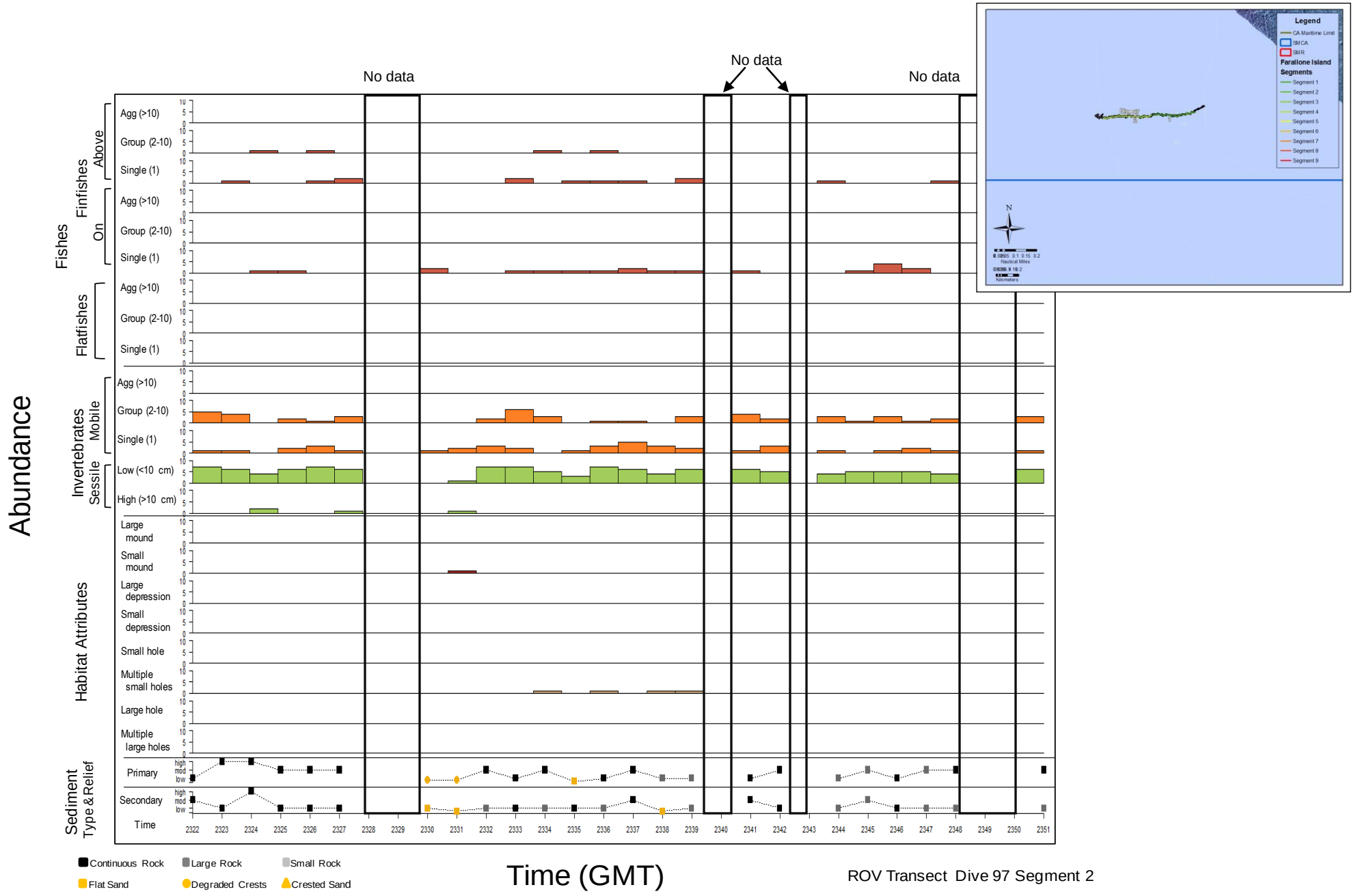

No data
No data
No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
2322
2323
2324
2325
2326
2327
2328
2329
2330
2331
2332
2333
2334
2335
2336
2337
2338
2339
2340
2341
2342
2343
2344
2345
2346
2347
2348
2349
2350
2351
Legend
CA Maritime Limit
SMCA
SMR
Farallone Island Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Segment 9
N
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 97 Segment 2

Figure 75

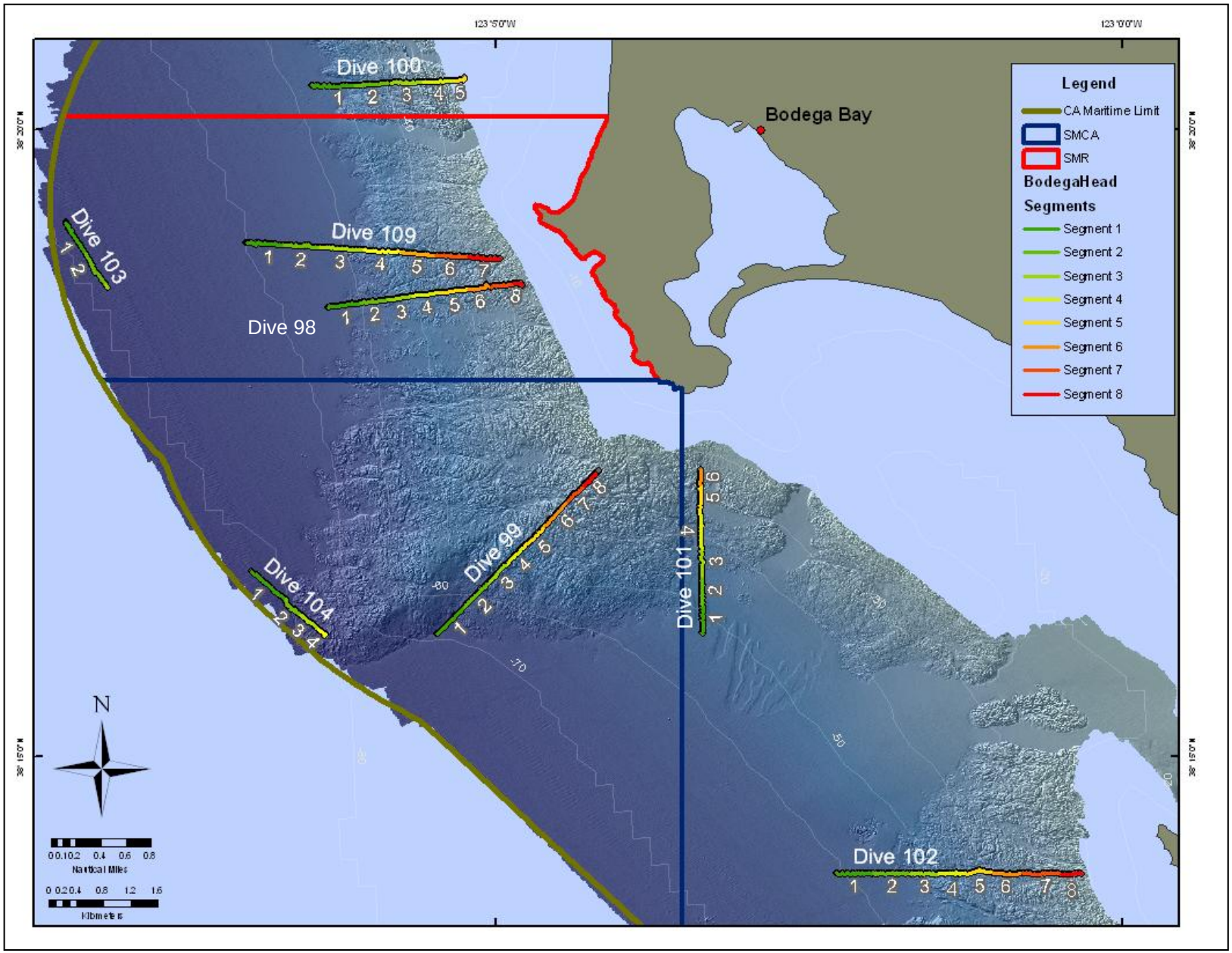


Figure 76: Bodega Head SMR/SMCA Operating Area

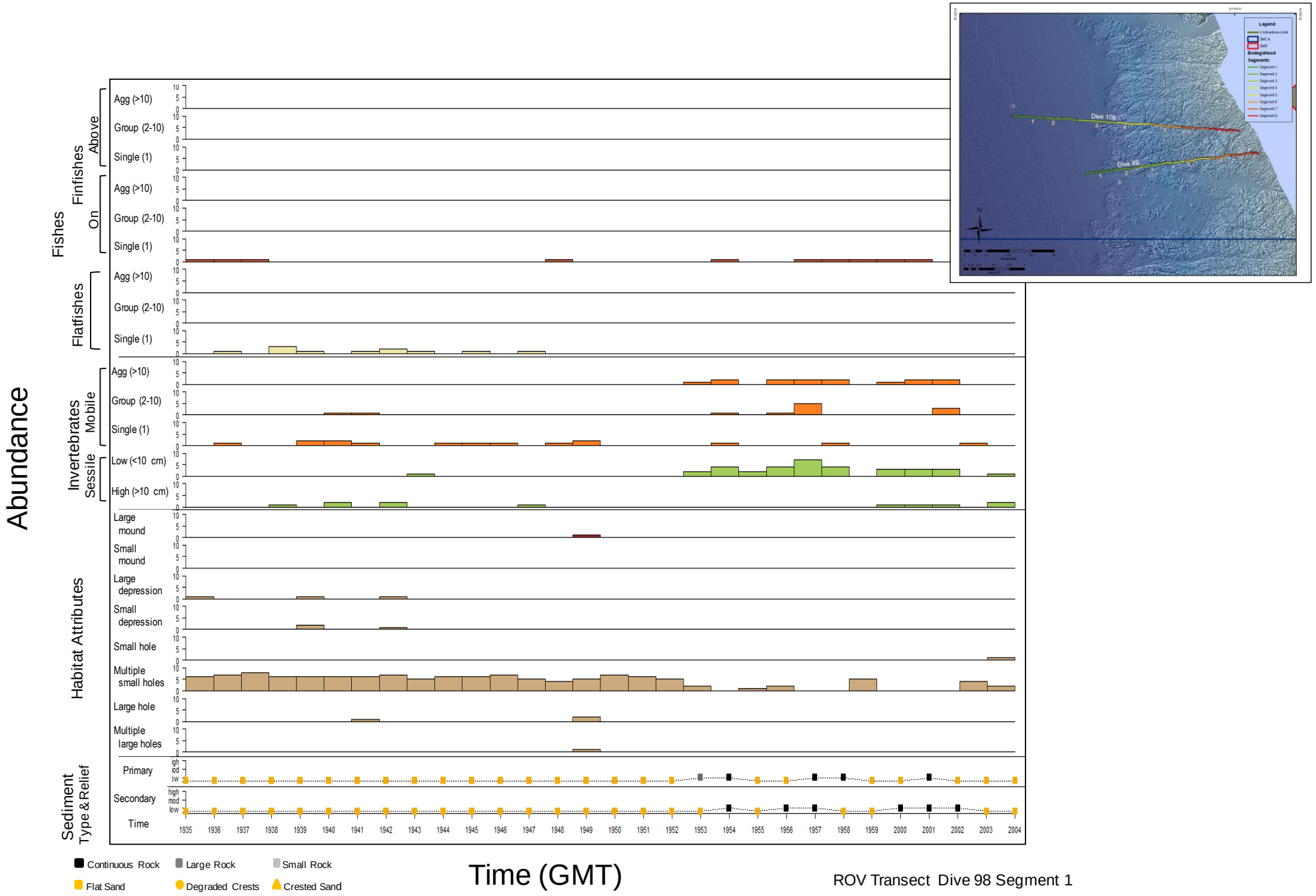

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
Time
1935
1936
1937
1938
1939
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
1955
1956
1957
1958
1959
2000
2001
2002
2003
2004
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
Dive 109
Dive 98
ROV Transect Dive 98 Segment 1

Figure 77

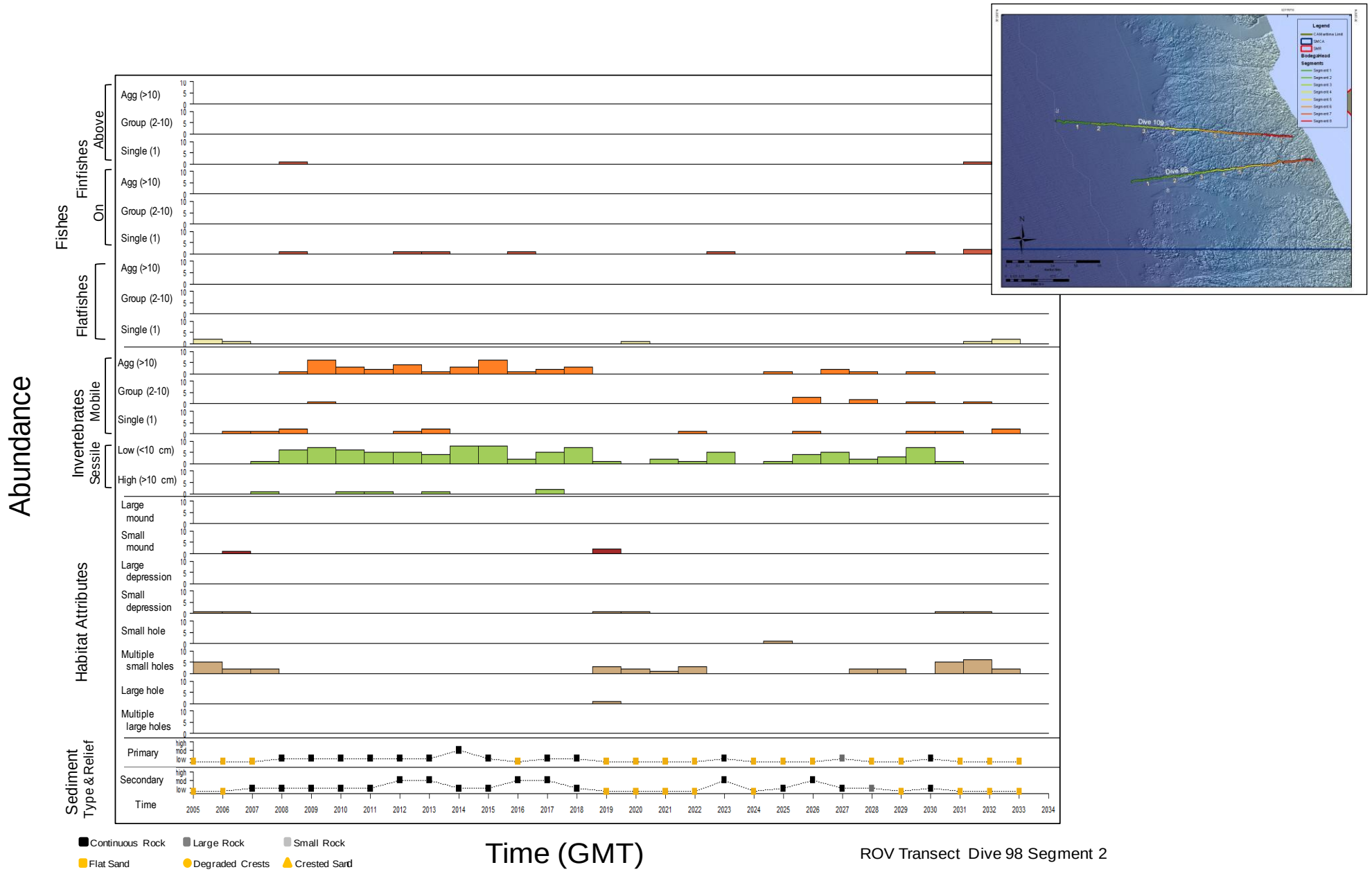

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 98 Segment 2
Legend
BodegaHead
Segments
Dive 109
Dive 98

Figure 78

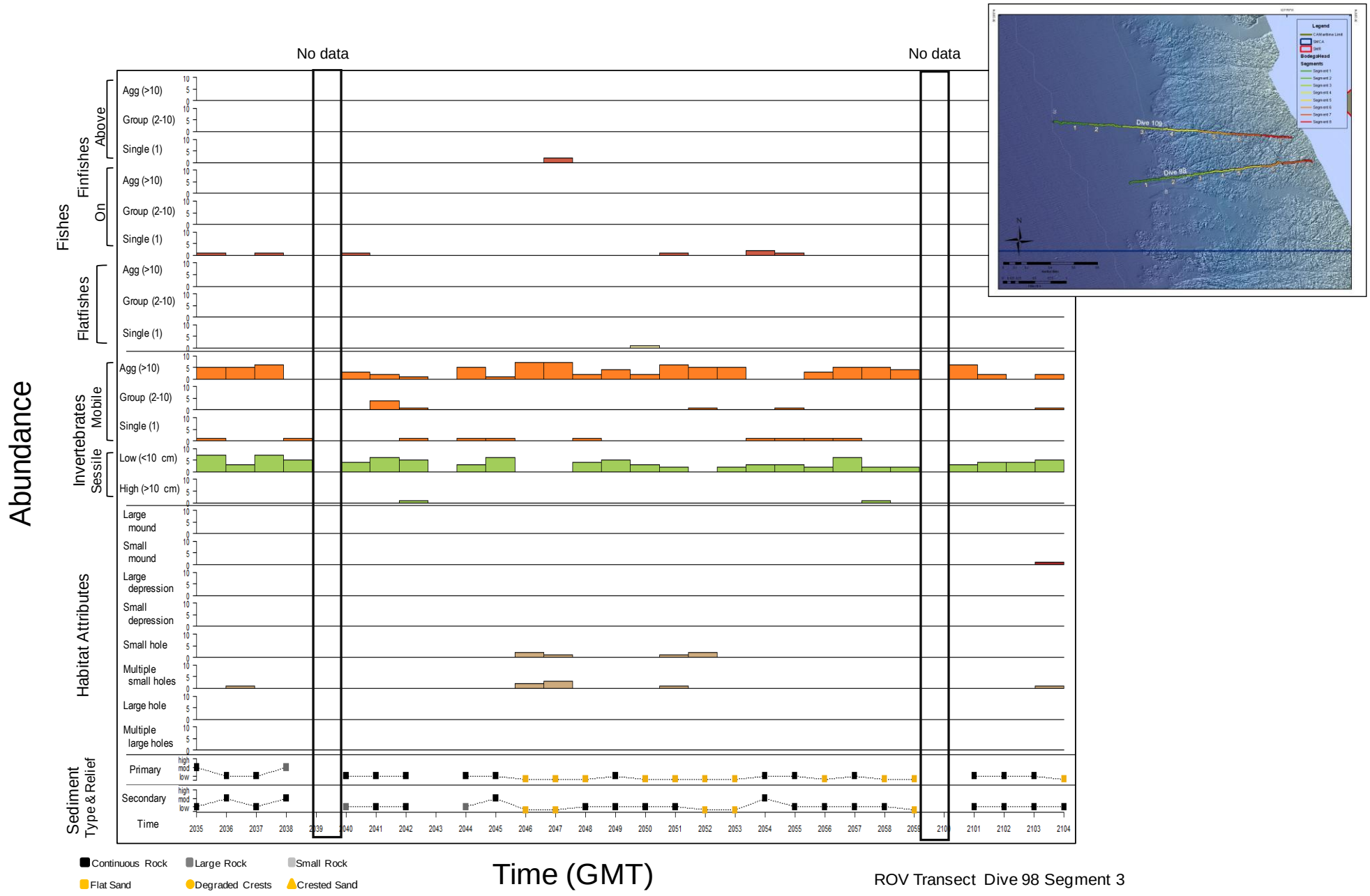

No data
No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2035
2036
2037
2038
2039
2040
2041
2042
2043
2044
2045
2046
2047
2048
2049
2050
2051
2052
2053
2054
2055
2056
2057
2058
2059
2100
2101
2102
2103
2104
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
Dive 109
Dive 98
ROV Transect Dive 98 Segment 3

Figure 79

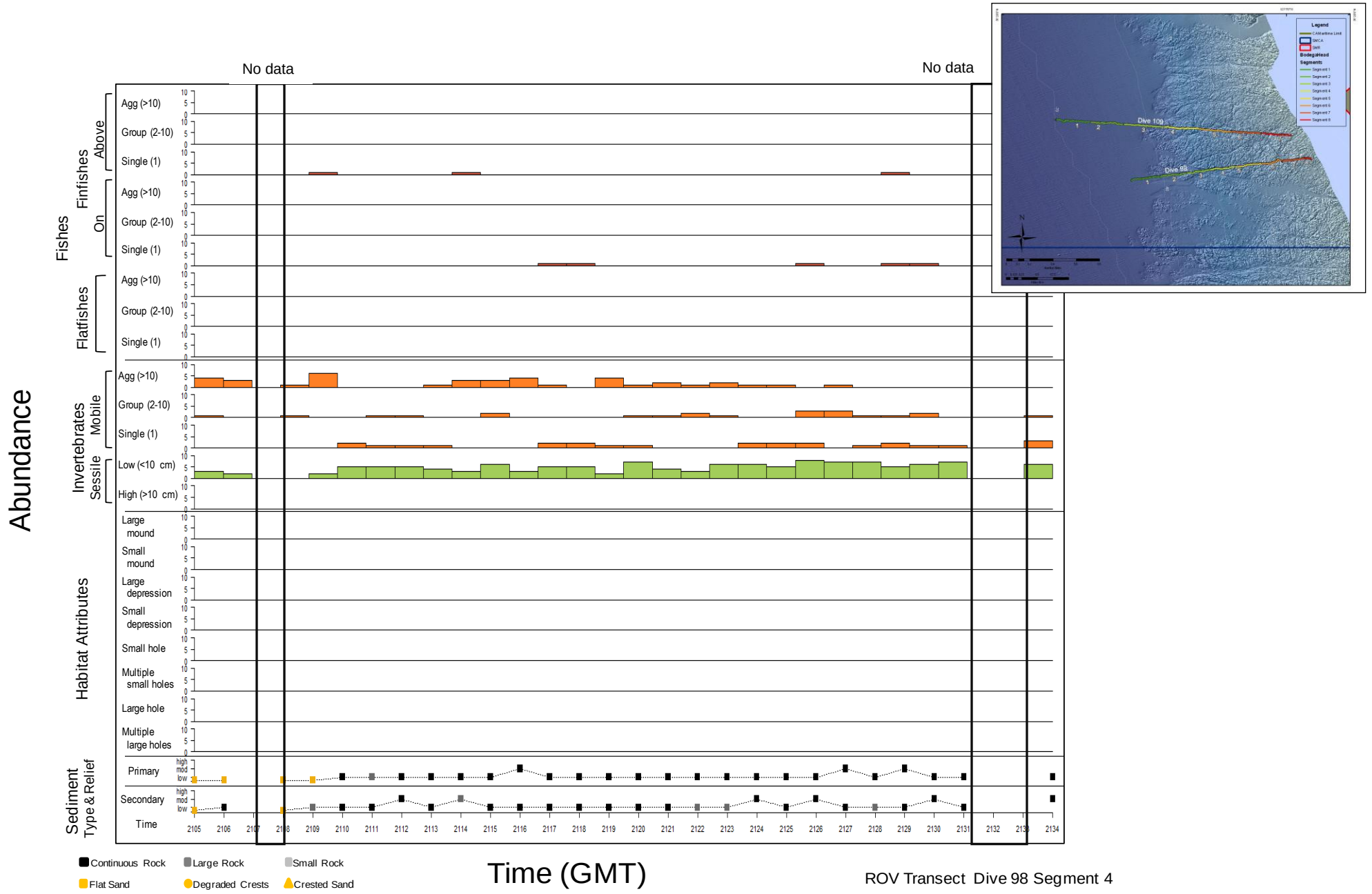

No data
No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
2105
2106
2107
2108
2109
2110
2111
2112
2113
2114
2115
2116
2117
2118
2119
2120
2121
2122
2123
2124
2125
2126
2127
2128
2129
2130
2131
2132
2133
2134
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 98 Segment 4
Legend
Dive 109
Dive 98

Figure 80

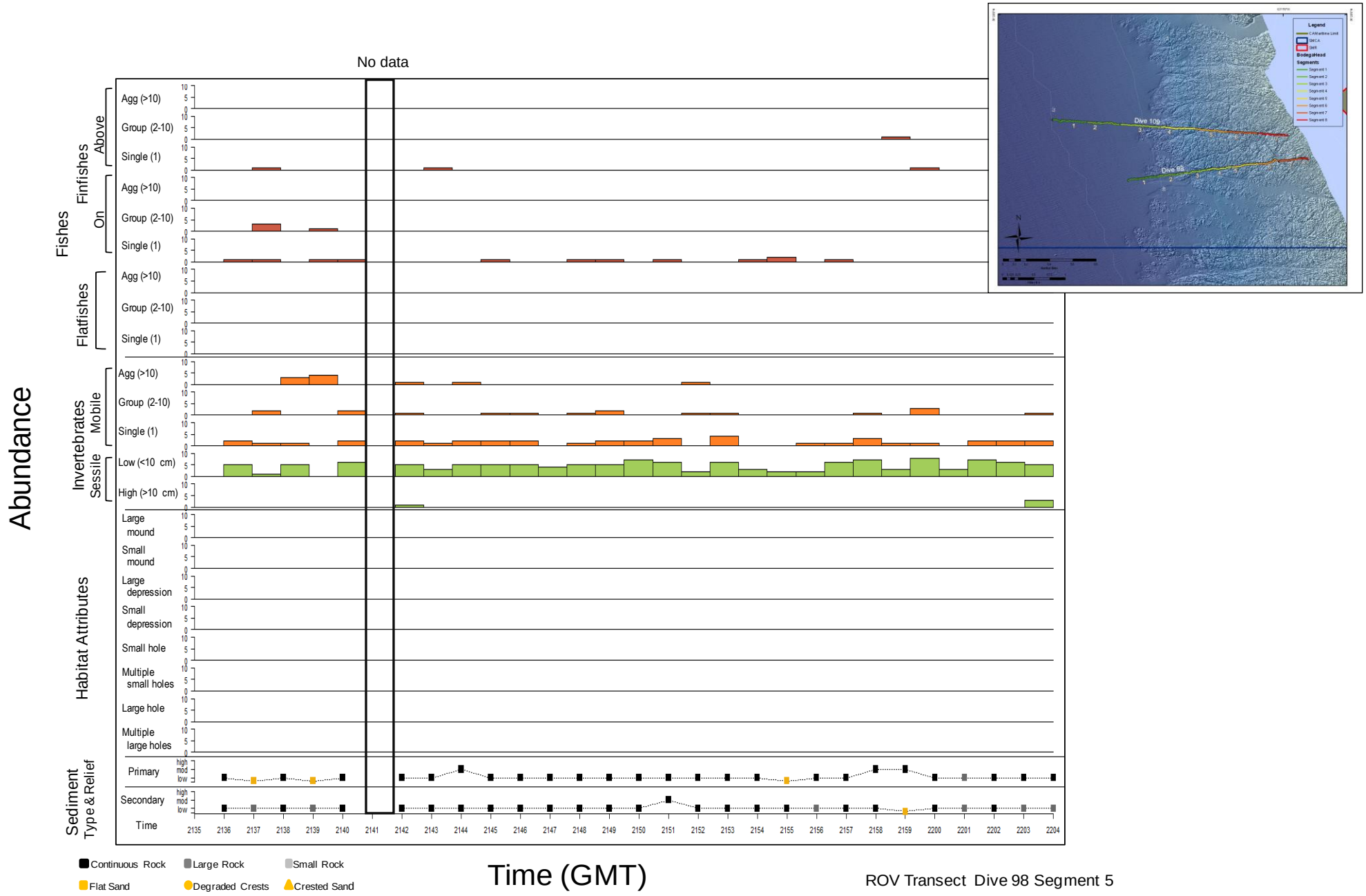

No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2135
2136
2137
2138
2139
2140
2141
2142
2143
2144
2145
2146
2147
2148
2149
2150
2151
2152
2153
2154
2155
2156
2157
2158
2159
2200
2201
2202
2203
2204
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 98 Segment 5
Legend
Dive 109
Dive 98

Figure 81

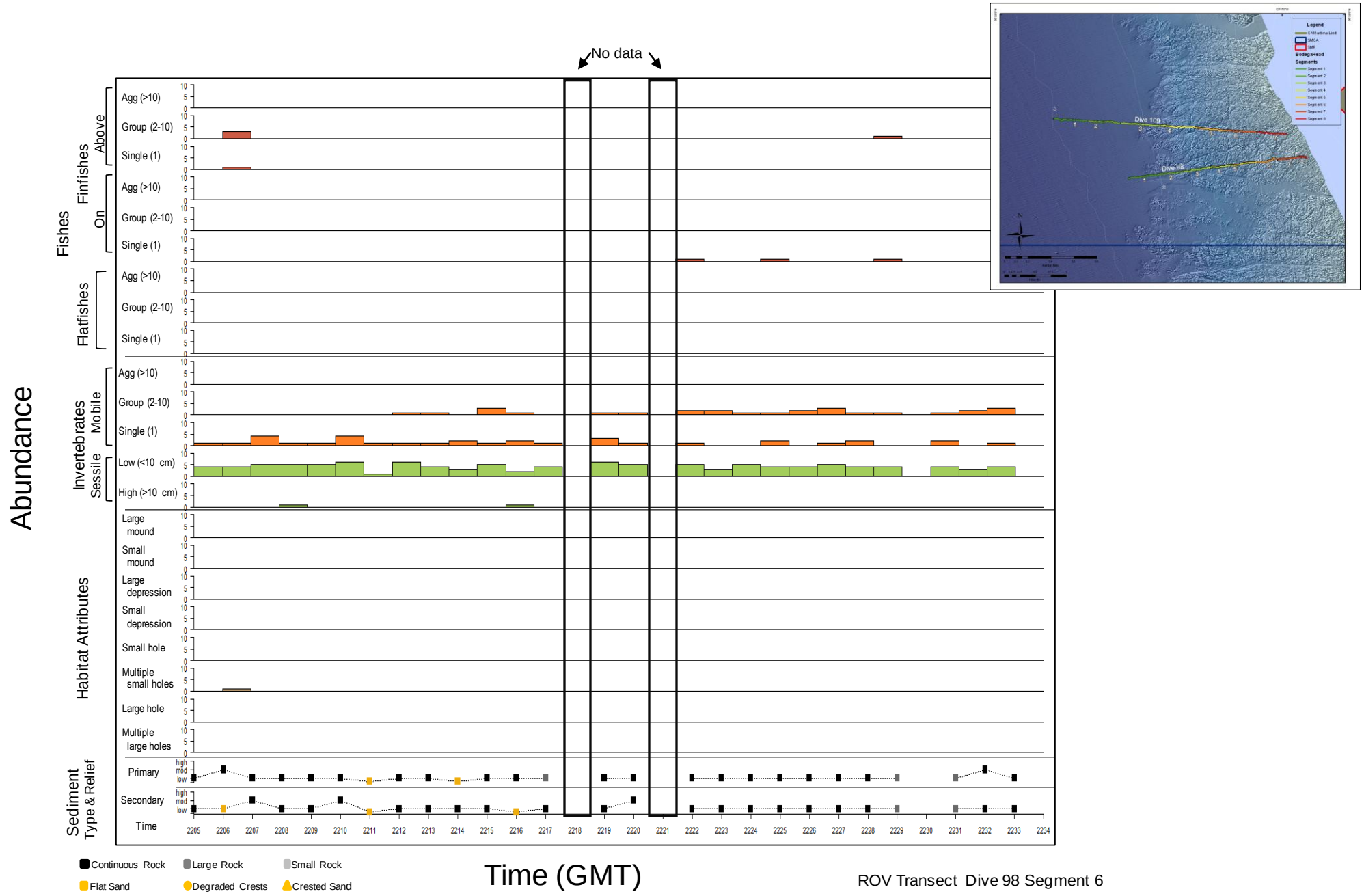

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2205
2206
2207
2208
2209
2210
2211
2212
2213
2214
2215
2216
2217
2218
2219
2220
2221
2222
2223
2224
2225
2226
2227
2228
2229
2230
2231
2232
2233
2234
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
Dive 109
Dive 98
ROV Transect Dive 98 Segment 6

Figure 82

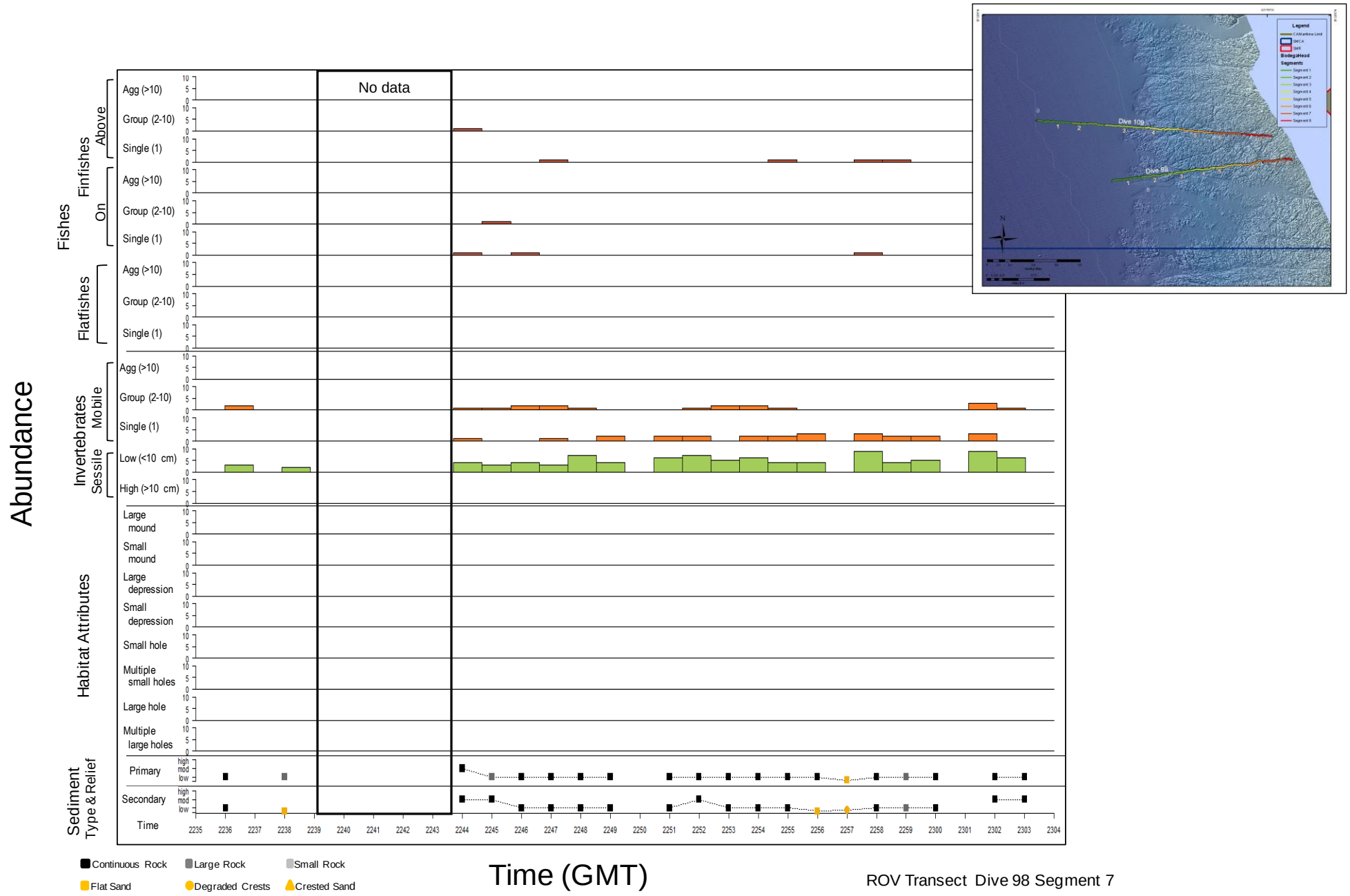

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
No data
2235
2236
2237
2238
2239
2240
2241
2242
2243
2244
2245
2246
2247
2248
2249
2250
2251
2252
2253
2254
2255
2256
2257
2258
2259
2300
2301
2302
2303
2304
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
Legend
Dive 109
Dive 98
ROV Transect Dive 98 Segment 7

Figure 83

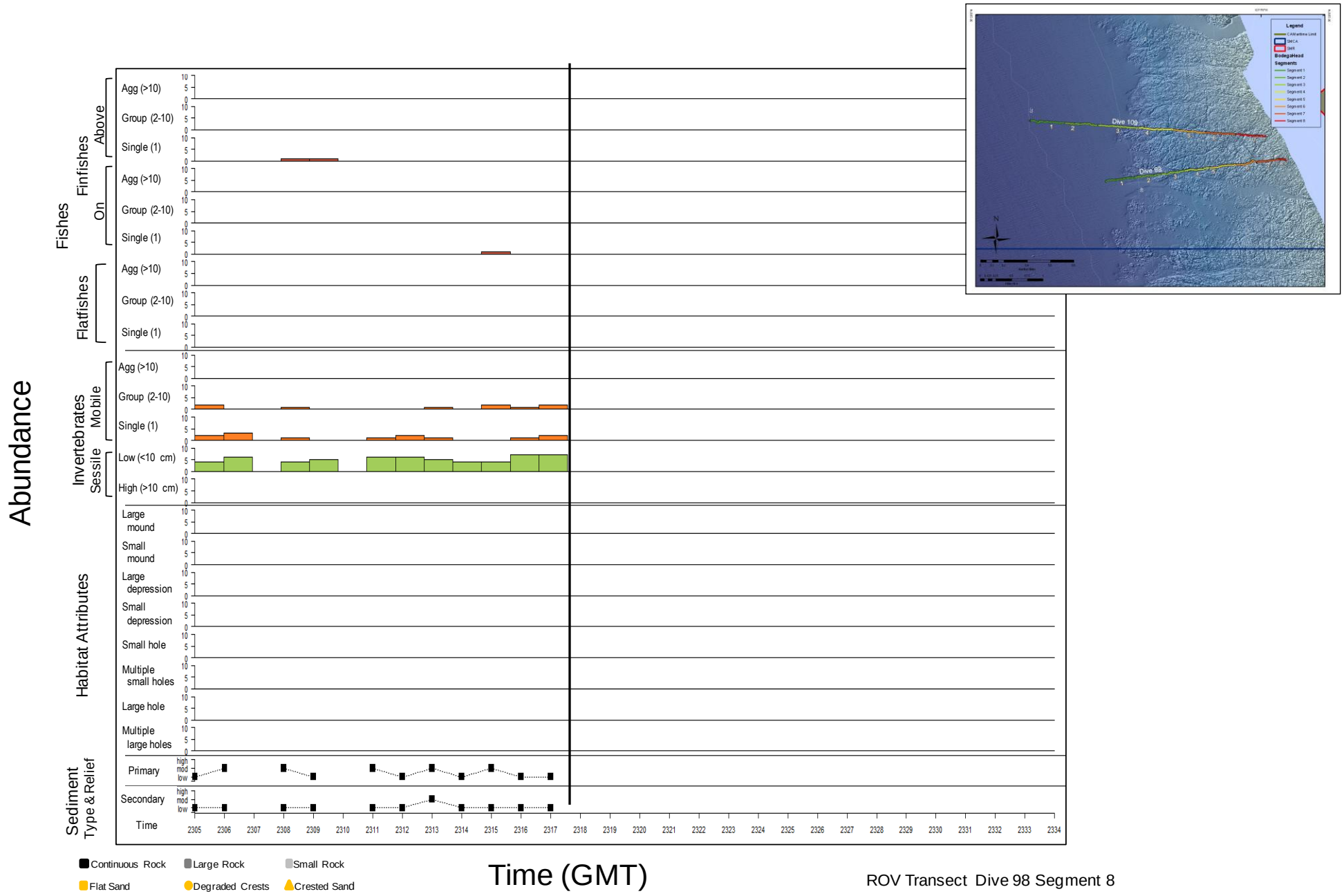

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
2305 2306 2307 2308 2309 2310 2311 2312 2313 2314 2315 2316 2317 2318 2319 2320 2321 2322 2323 2324 2325 2326 2327 2328 2329 2330 2331 2332 2333 2334
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 98 Segment 8
Legend
Dive 100
Dive 98

Figure 84

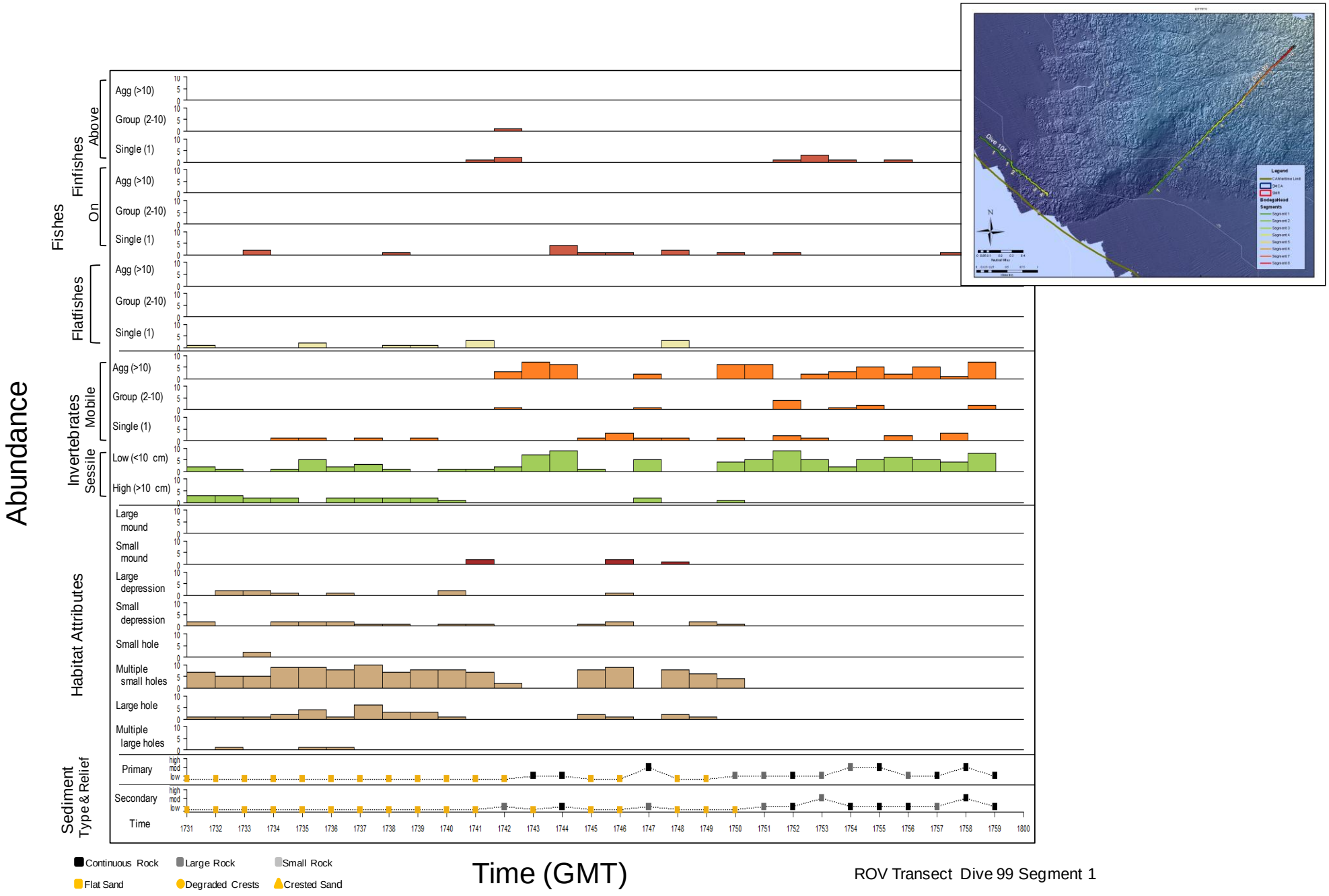

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1731 1732 1733 1734 1735 1736 1737 1738 1739 1740 1741 1742 1743 1744 1745 1746 1747 1748 1749 1750 1751 1752 1753 1754 1755 1756 1757 1758 1759 1800
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 99 Segment 1

Figure 85

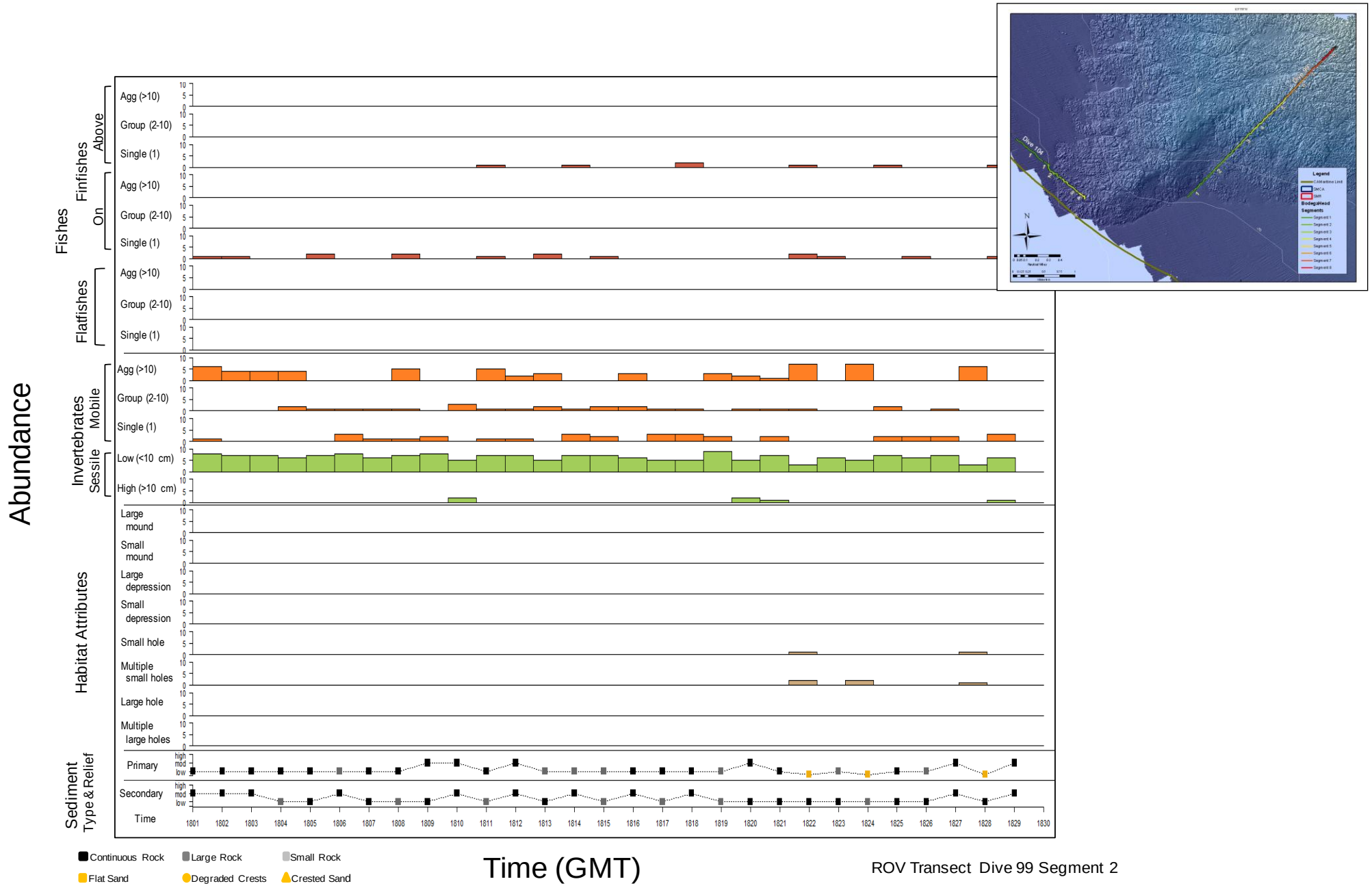

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
1801 1802 1803 1804 1805 1806 1807 1808 1809 1810 1811 1812 1813 1814 1815 1816 1817 1818 1819 1820 1821 1822 1823 1824 1825 1826 1827 1828 1829 1830
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 99 Segment 2

Figure 86

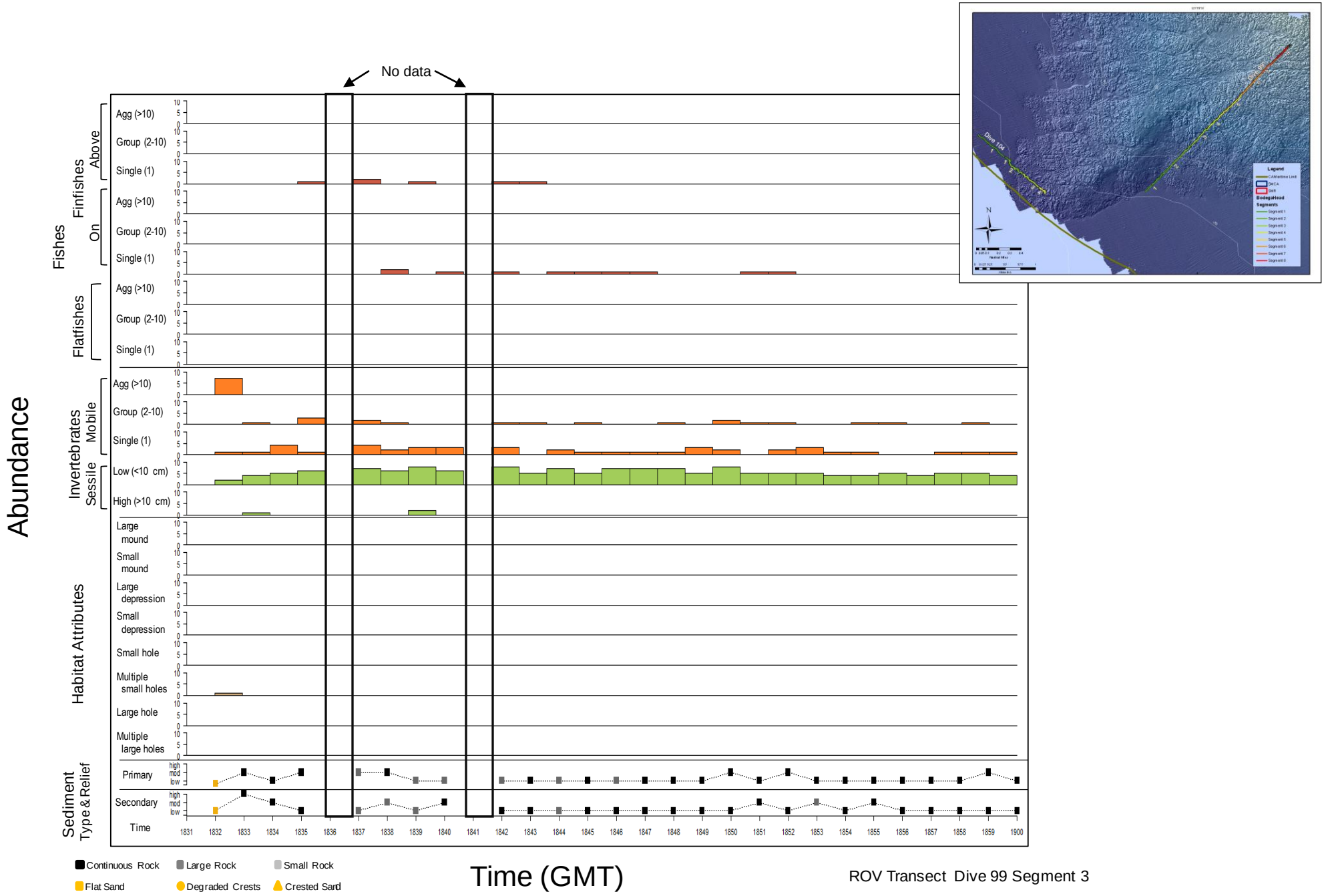

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1843 1844 1845 1846 1847 1848 1849 1850 1851 1852 1853 1854 1855 1856 1857 1858 1859 1900
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 99 Segment 3

Figure 87

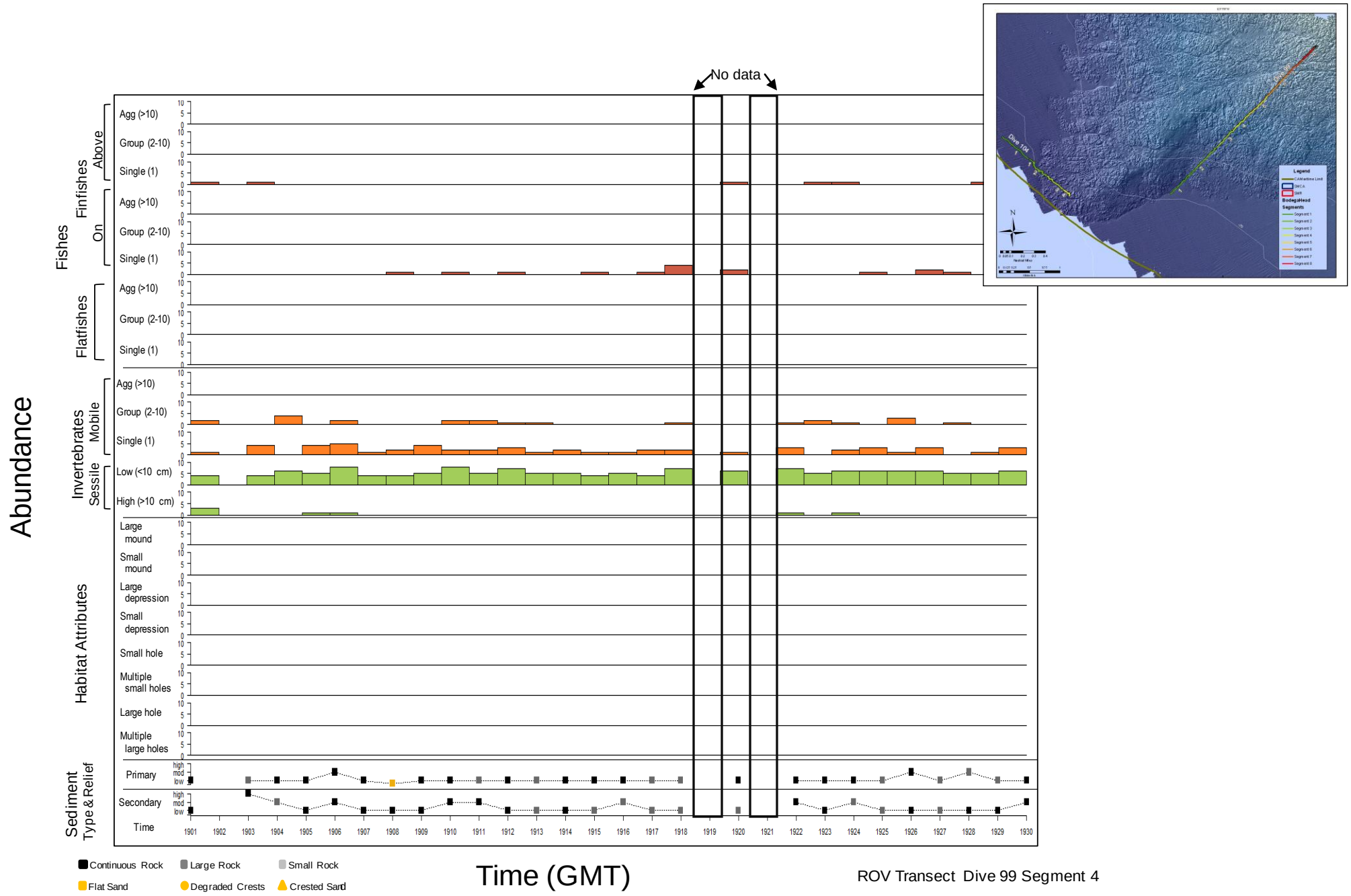

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1901
1902
1903
1904
1905
1906
1907
1908
1909
1910
1911
1912
1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
1924
1925
1926
1927
1928
1929
1930
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 99 Segment 4

Figure 88

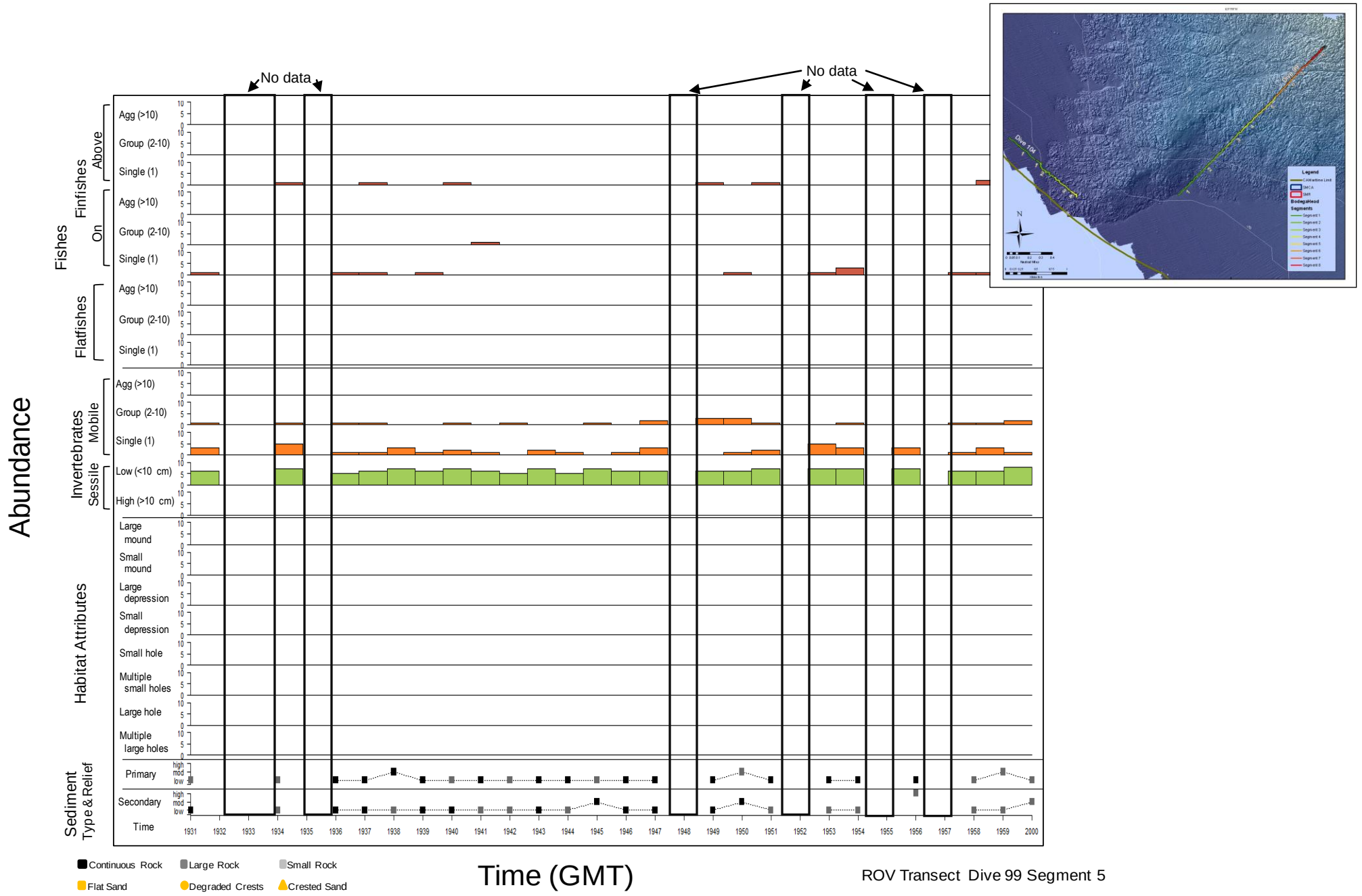

No data
No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1931
1932
1933
1934
1935
1936
1937
1938
1939
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
1955
1956
1957
1958
1959
2000
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 99 Segment 5

Figure 89

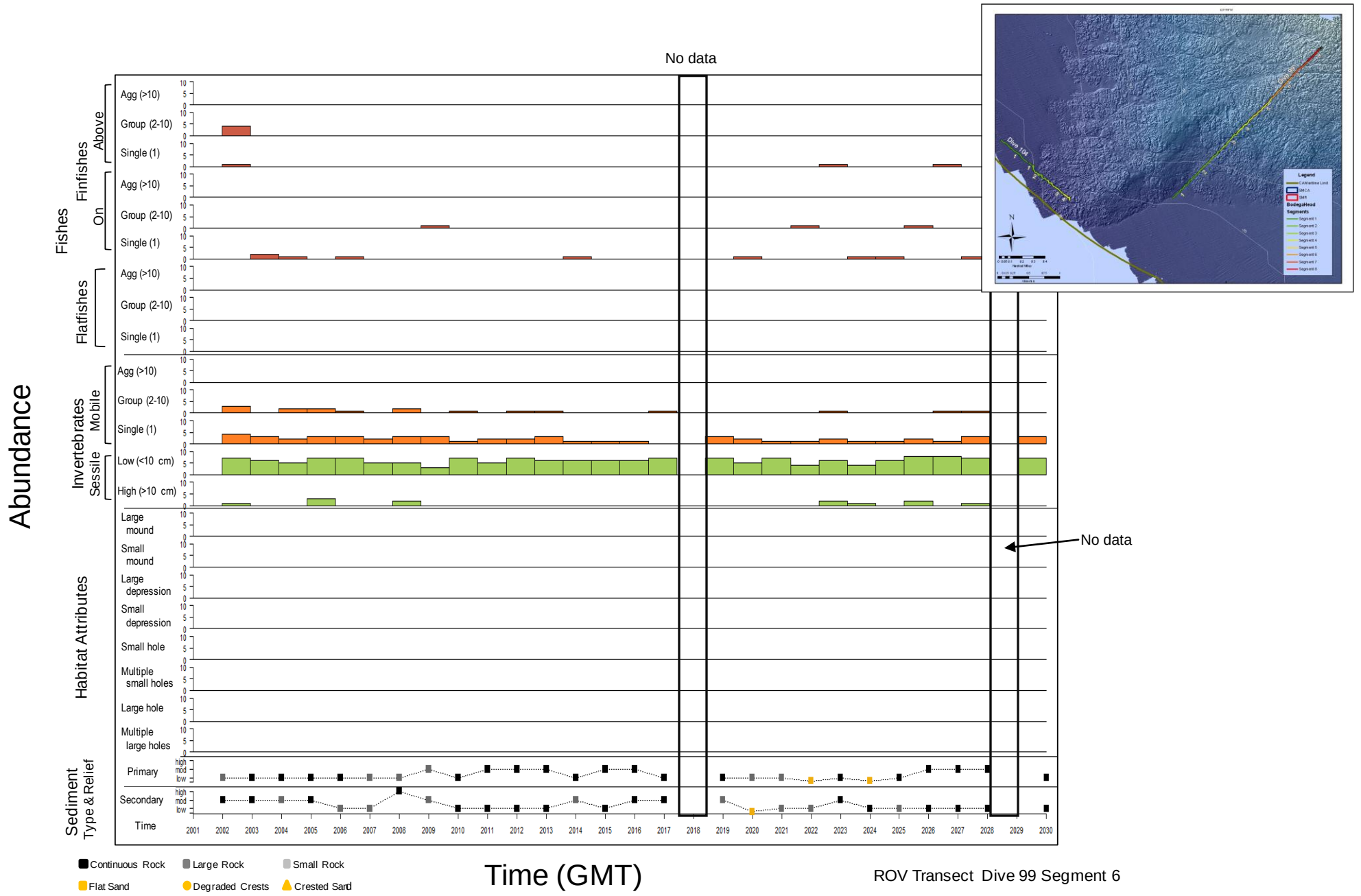

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
No data
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 99 Segment 6

Figure 90

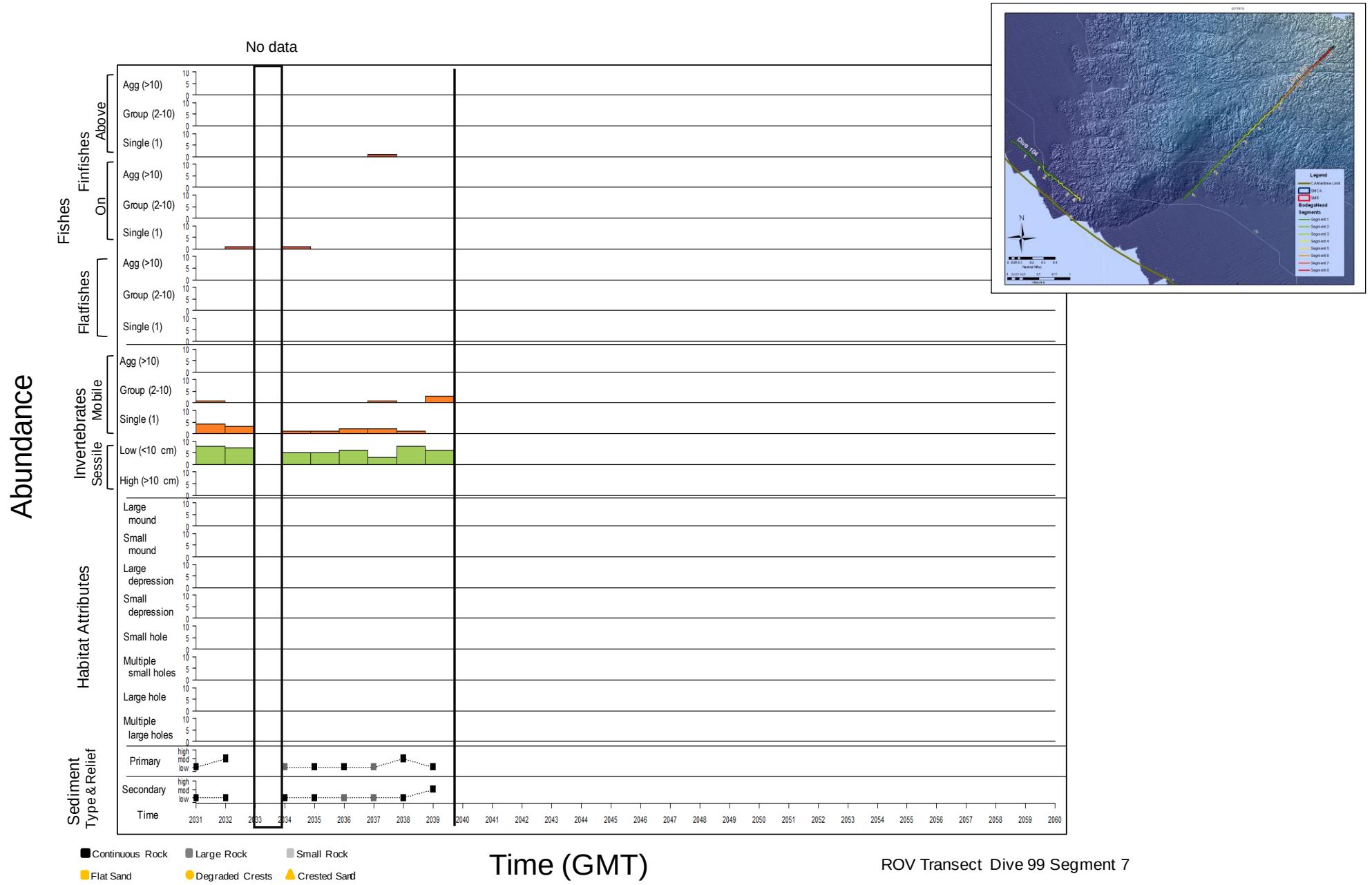

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Invertebrates
Mobile
Sessile
Habitat Attributes
Sediment
Type & Relief
Agg (>10)
Group (2-10)
Single (1)
Low (<10 cm)
High (>10 cm)
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Primary
Secondary
high
mod
low
Time
2031
2032
2033
2034
2035
2036
2037
2038
2039
2040
2041
2042
2043
2044
2045
2046
2047
2048
2049
2050
2051
2052
2053
2054
2055
2056
2057
2058
2059
2060
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 99 Segment 7

Figure 91

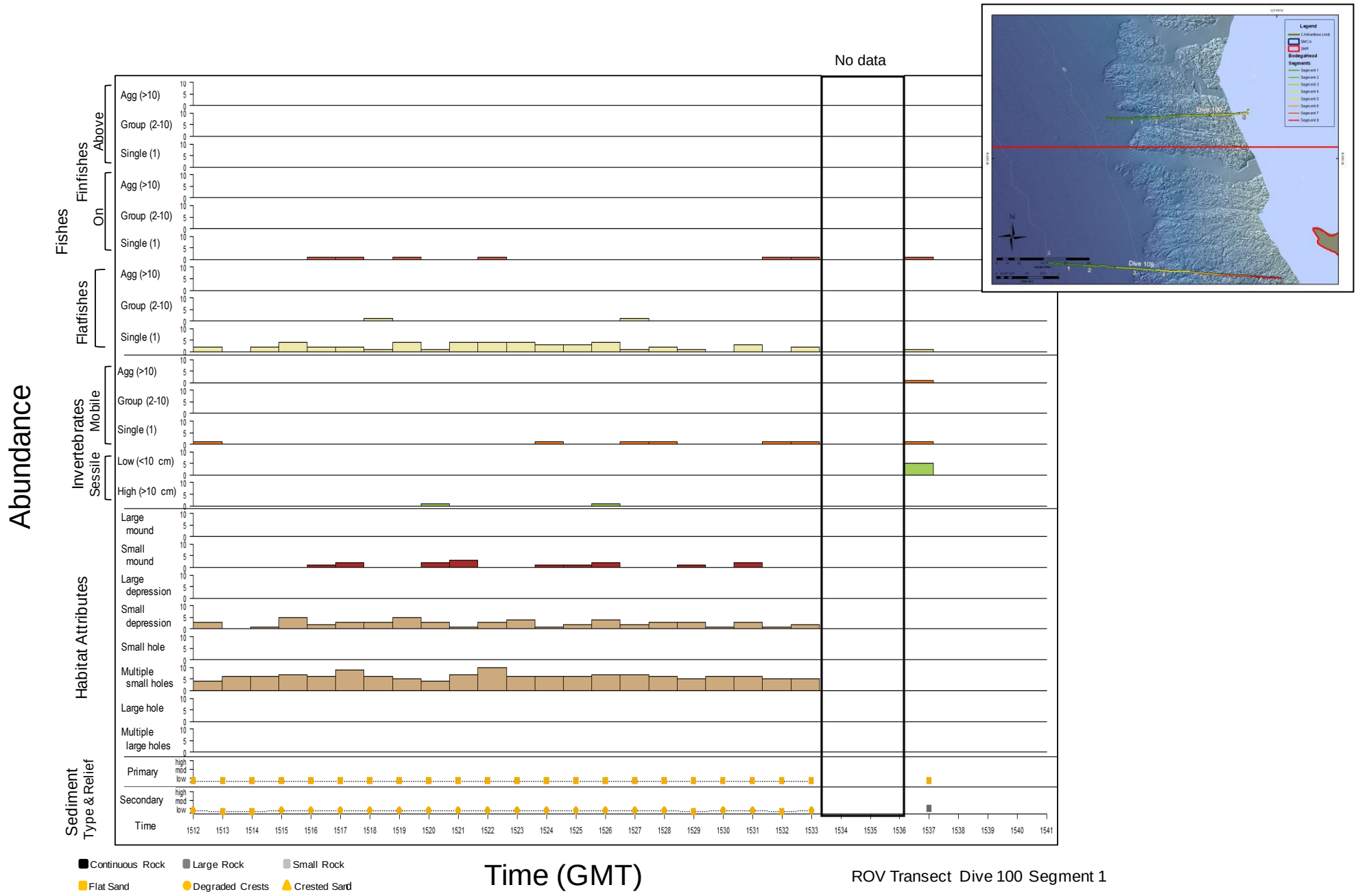

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1512 1513 1514 1515 1516 1517 1518 1519 1520 1521 1522 1523 1524 1525 1526 1527 1528 1529 1530 1531 1532 1533 1534 1535 1536 1537 1538 1539 1540 1541
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 100 Segment 1

Figure 92

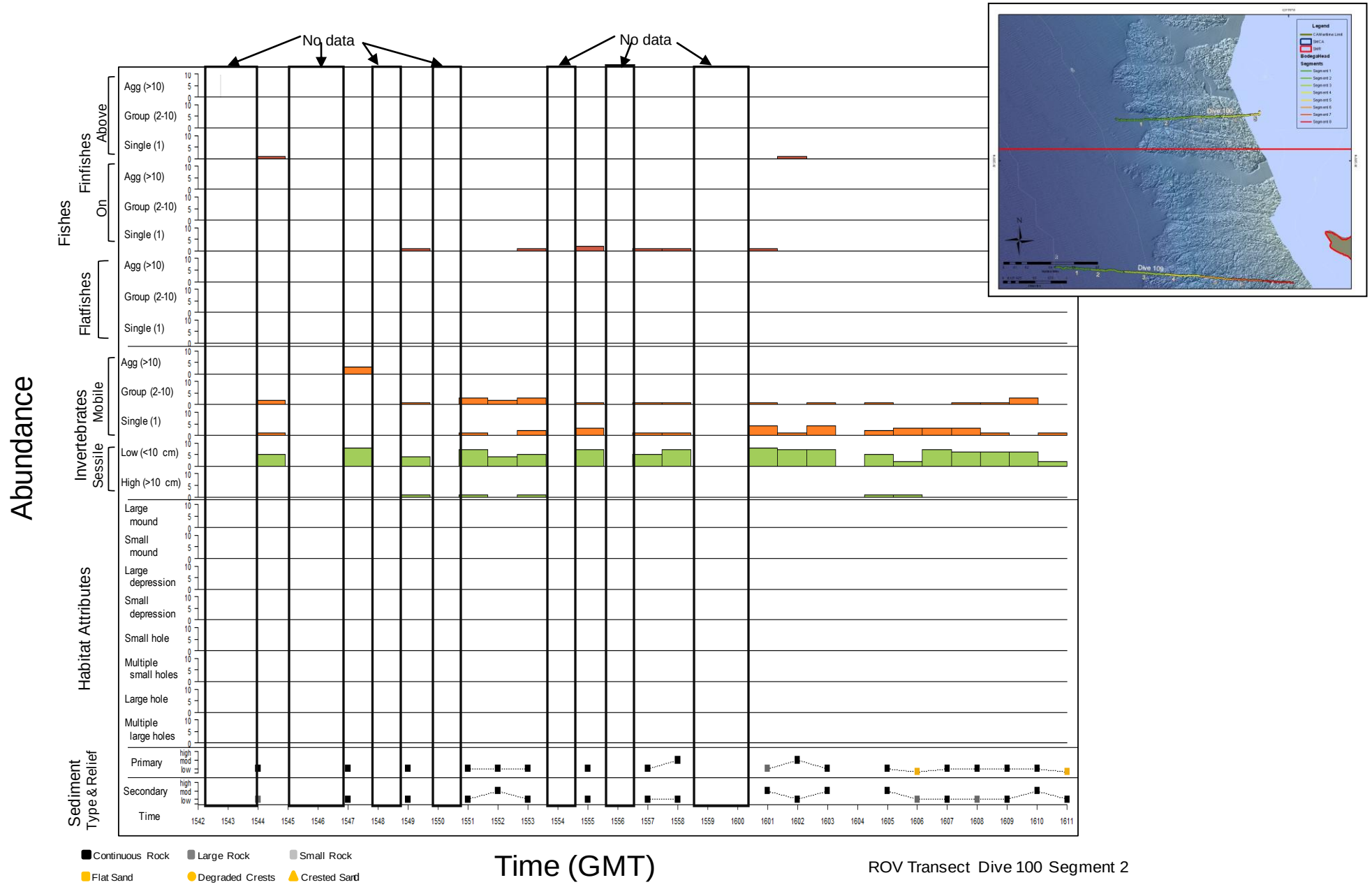

No data
No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Invertebrates
Mobile
Sessile
Habitat Attributes
Sediment
Type & Relief
Agg (>10)
Group (2-10)
Single (1)
Low (<10 cm)
High (>10 cm)
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Primary
Secondary
high
mod
low
Time
1542 1543 1544 1545 1546 1547 1548 1549 1550 1551 1552 1553 1554 1555 1556 1557 1558 1559 1600 1601 1602 1603 1604 1605 1606 1607 1608 1609 1610 1611
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 100 Segment 2
Legend
Bodega Head
Segments
Dive 100
Dive 109
N

Figure 93

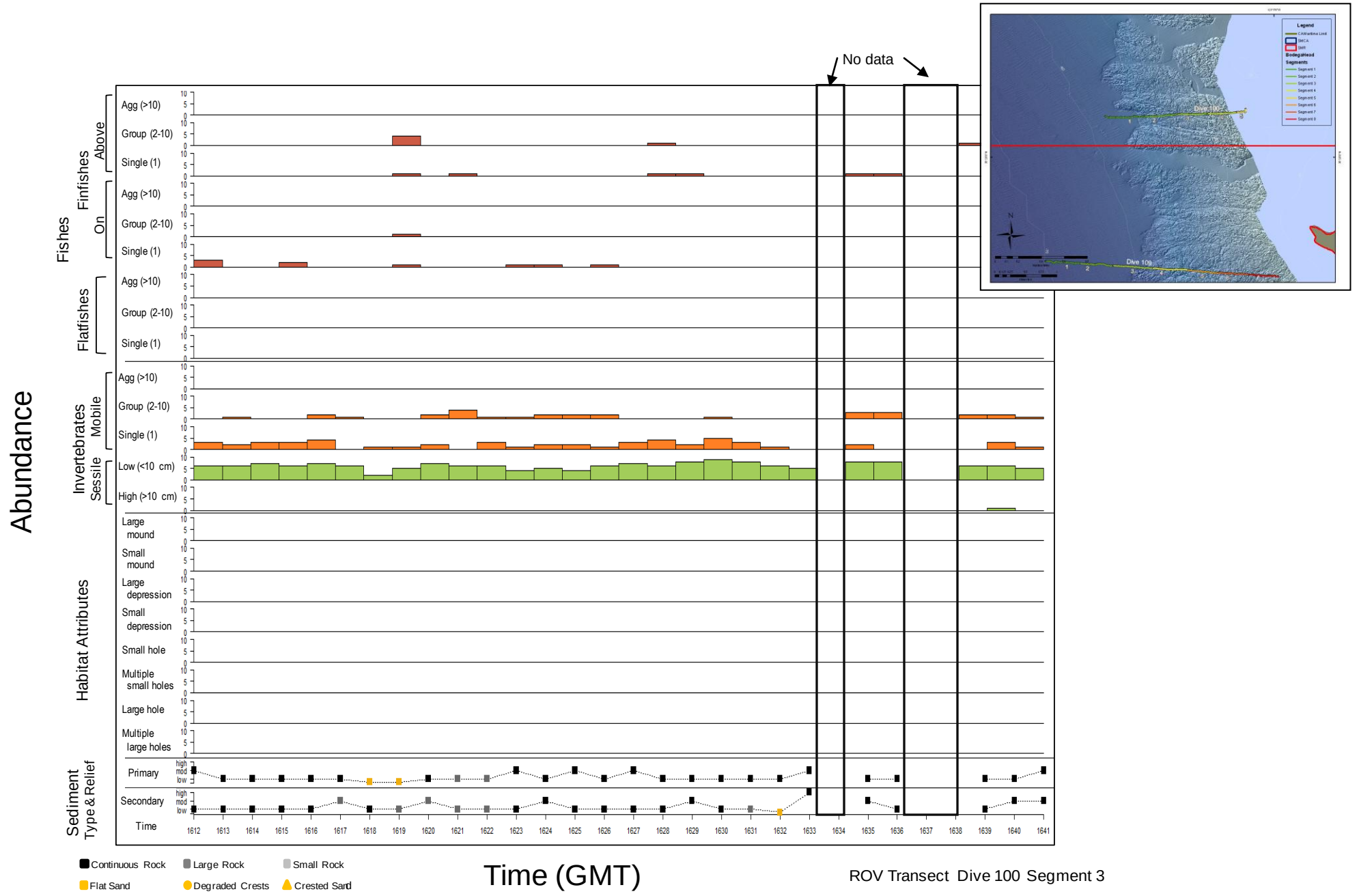

No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
1612 1613 1614 1615 1616 1617 1618 1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1629 1630 1631 1632 1633 1634 1635 1636 1637 1638 1639 1640 1641
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 100 Segment 3

Figure 94

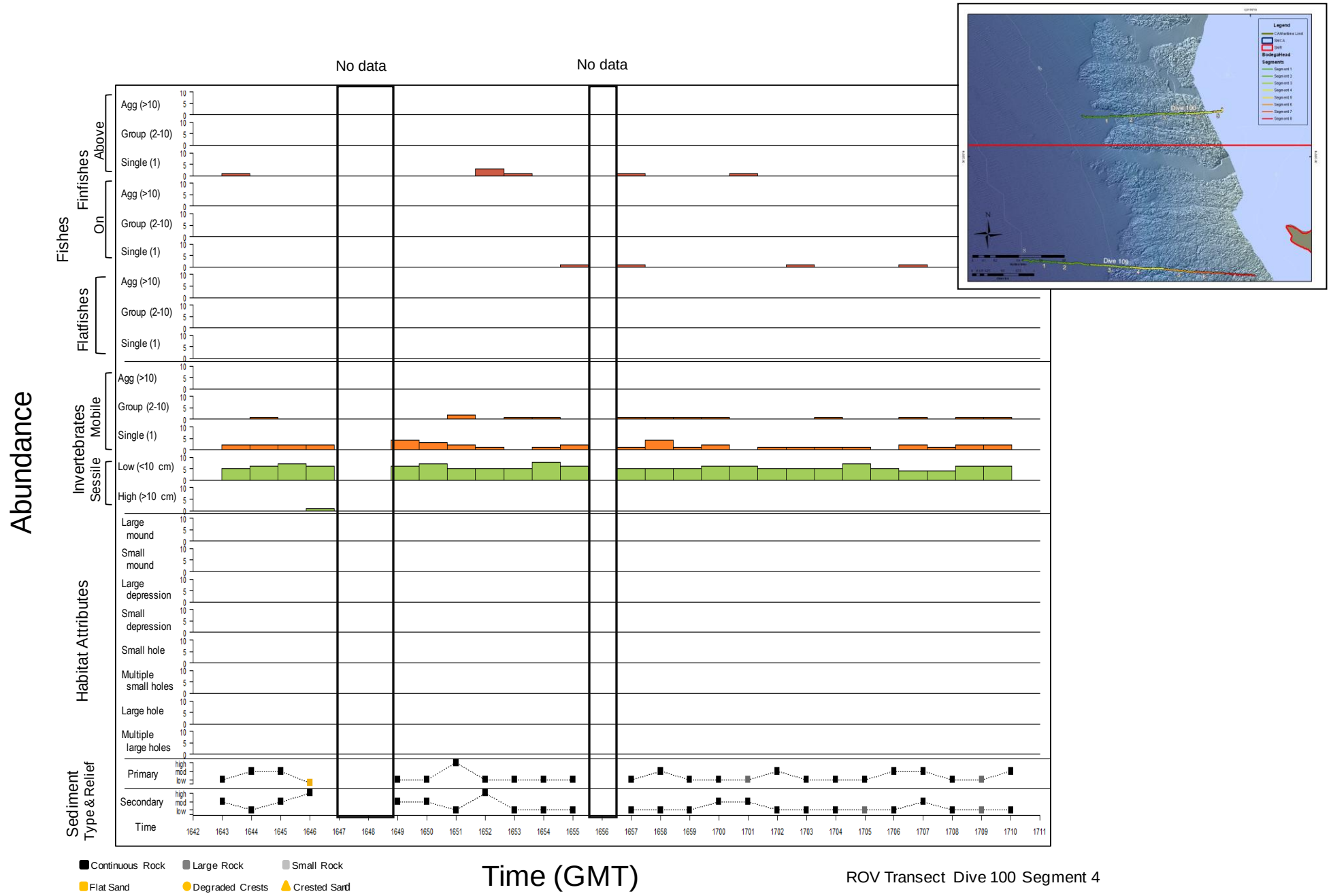

No data
No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1642 1643 1644 1645 1646 1647 1648 1649 1650 1651 1652 1653 1654 1655 1656 1657 1658 1659 1700 1701 1702 1703 1704 1705 1706 1707 1708 1709 1710 1711
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 100 Segment 4

Figure 95

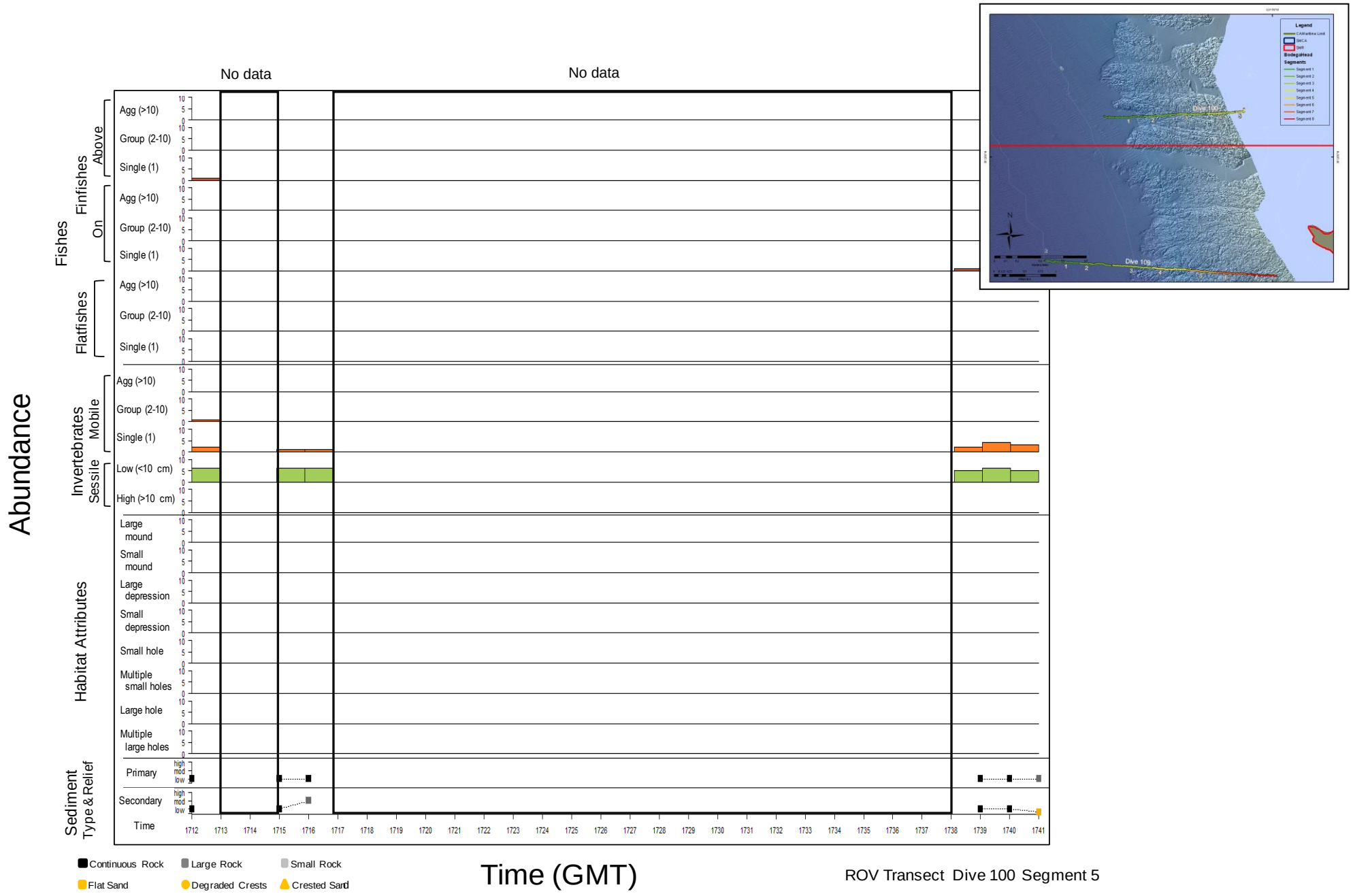

No data
No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1712
1713
1714
1715
1716
1717
1718
1719
1720
1721
1722
1723
1724
1725
1726
1727
1728
1729
1730
1731
1732
1733
1734
1735
1736
1737
1738
1739
1740
1741
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 100 Segment 5
Legend
Dive 100
Dive 109

Figure 96

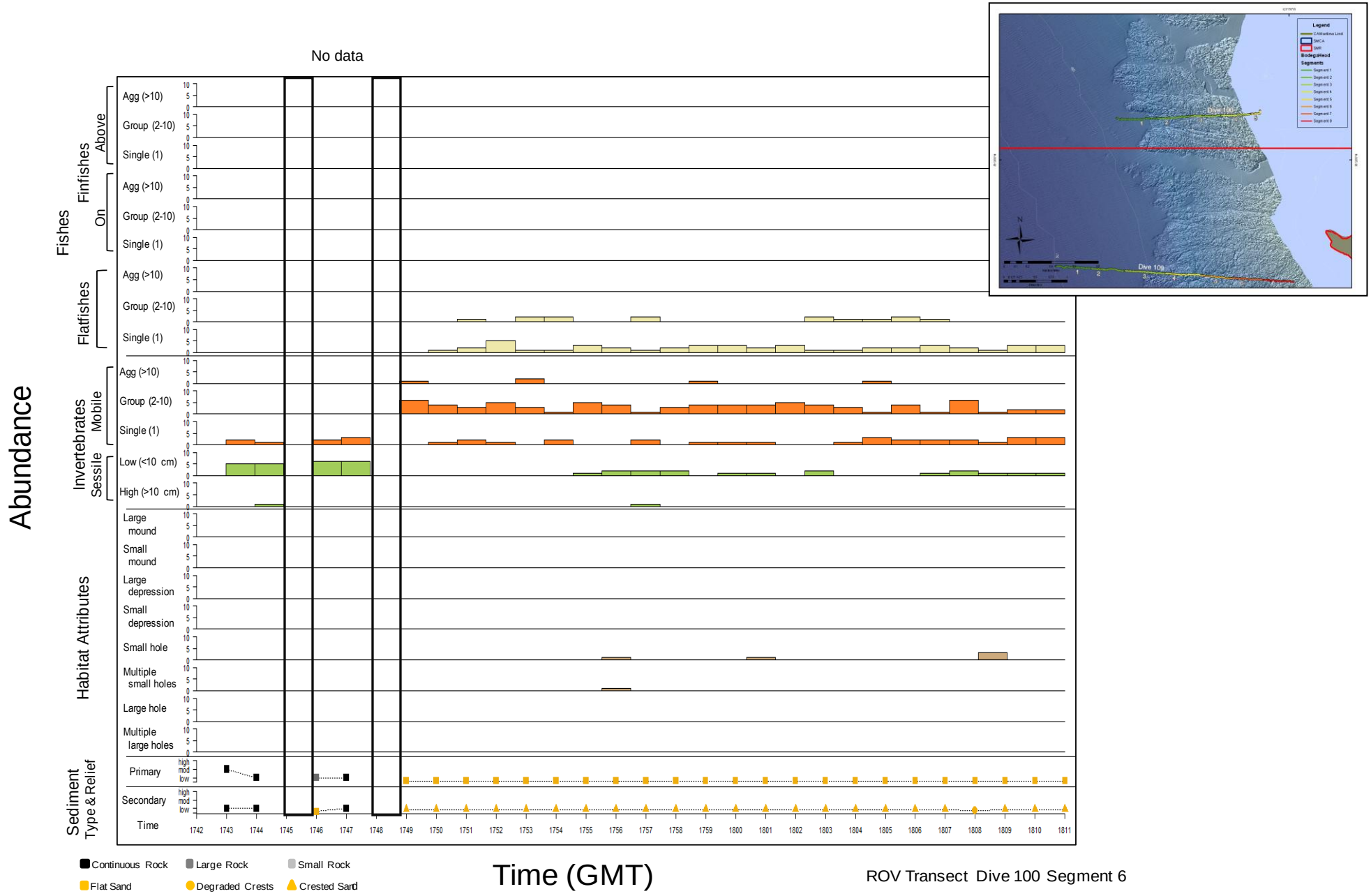

No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
1742 1743 1744 1745 1746 1747 1748 1749 1750 1751 1752 1753 1754 1755 1756 1757 1758 1759 1800 1801 1802 1803 1804 1805 1806 1807 1808 1809 1810 1811
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
Legend
Dive 100
Dive 109
ROV Transect Dive 100 Segment 6

Figure 97

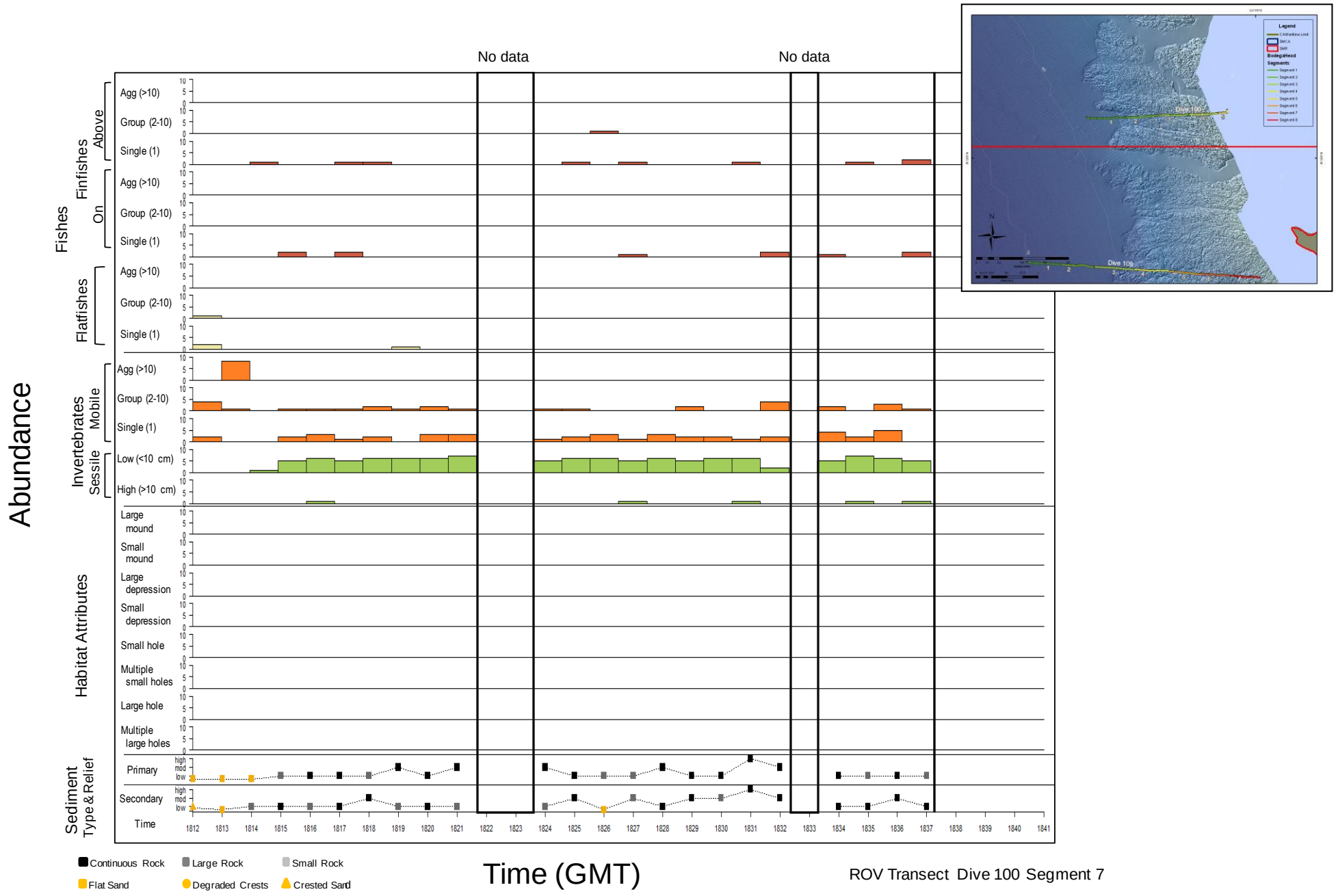

No data
No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
1812 1813 1814 1815 1816 1817 1818 1819 1820 1821 1822 1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 100 Segment 7

Figure 98

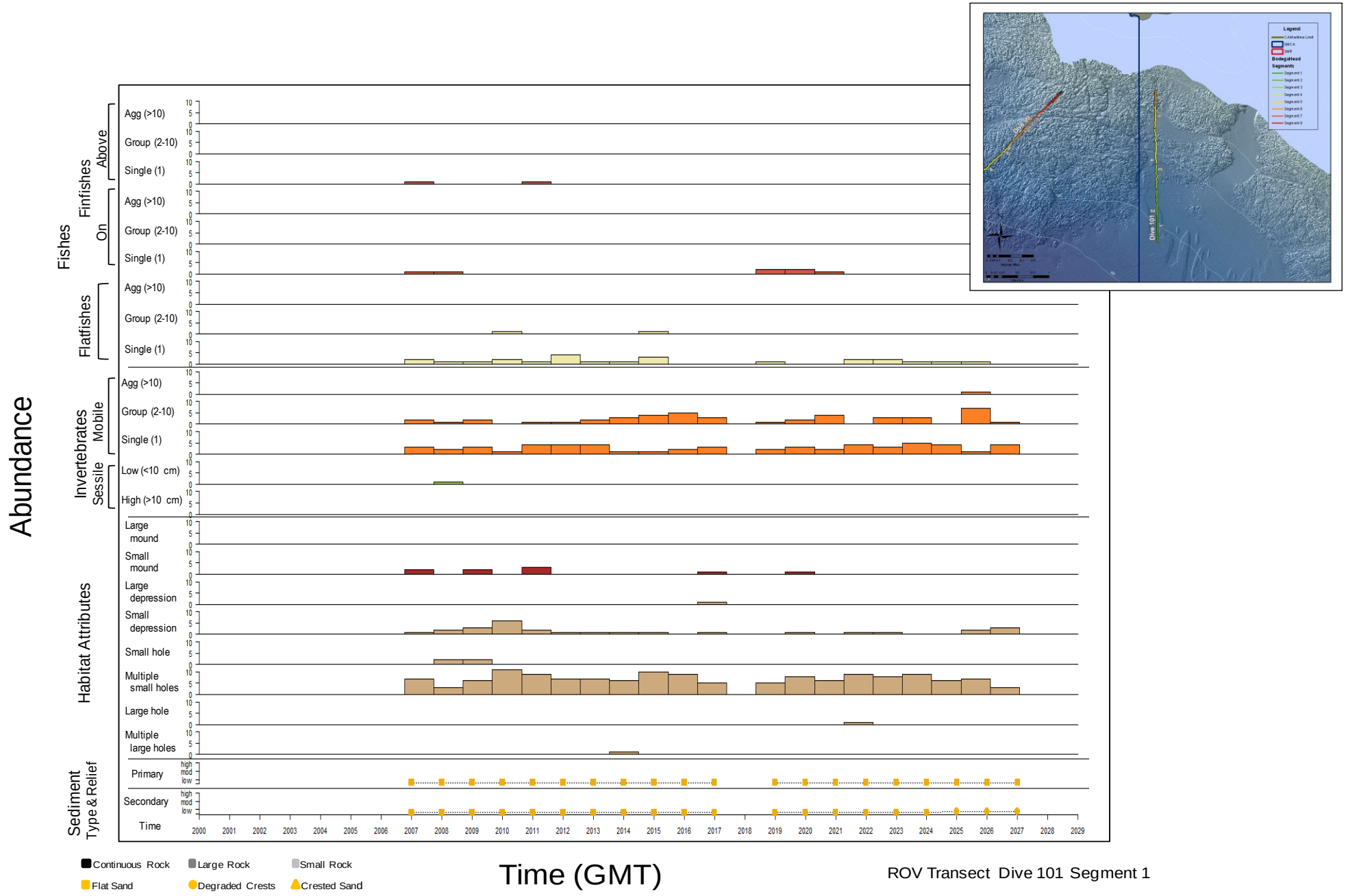

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 101 Segment 1

Figure 99

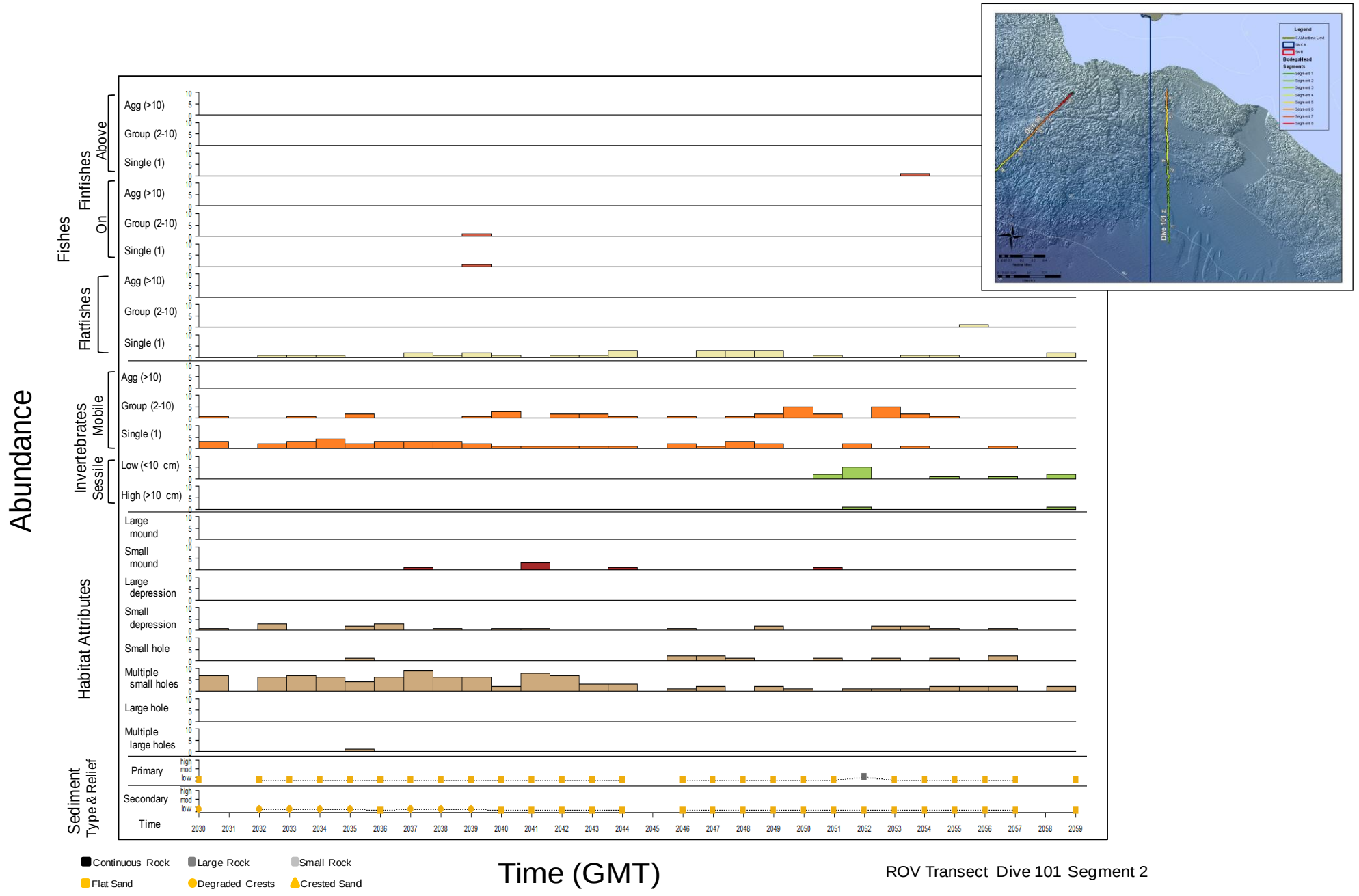

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2030
2031
2032
2033
2034
2035
2036
2037
2038
2039
2040
2041
2042
2043
2044
2045
2046
2047
2048
2049
2050
2051
2052
2053
2054
2055
2056
2057
2058
2059
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 101 Segment 2
Legend
Dive 101 2

Figure 100

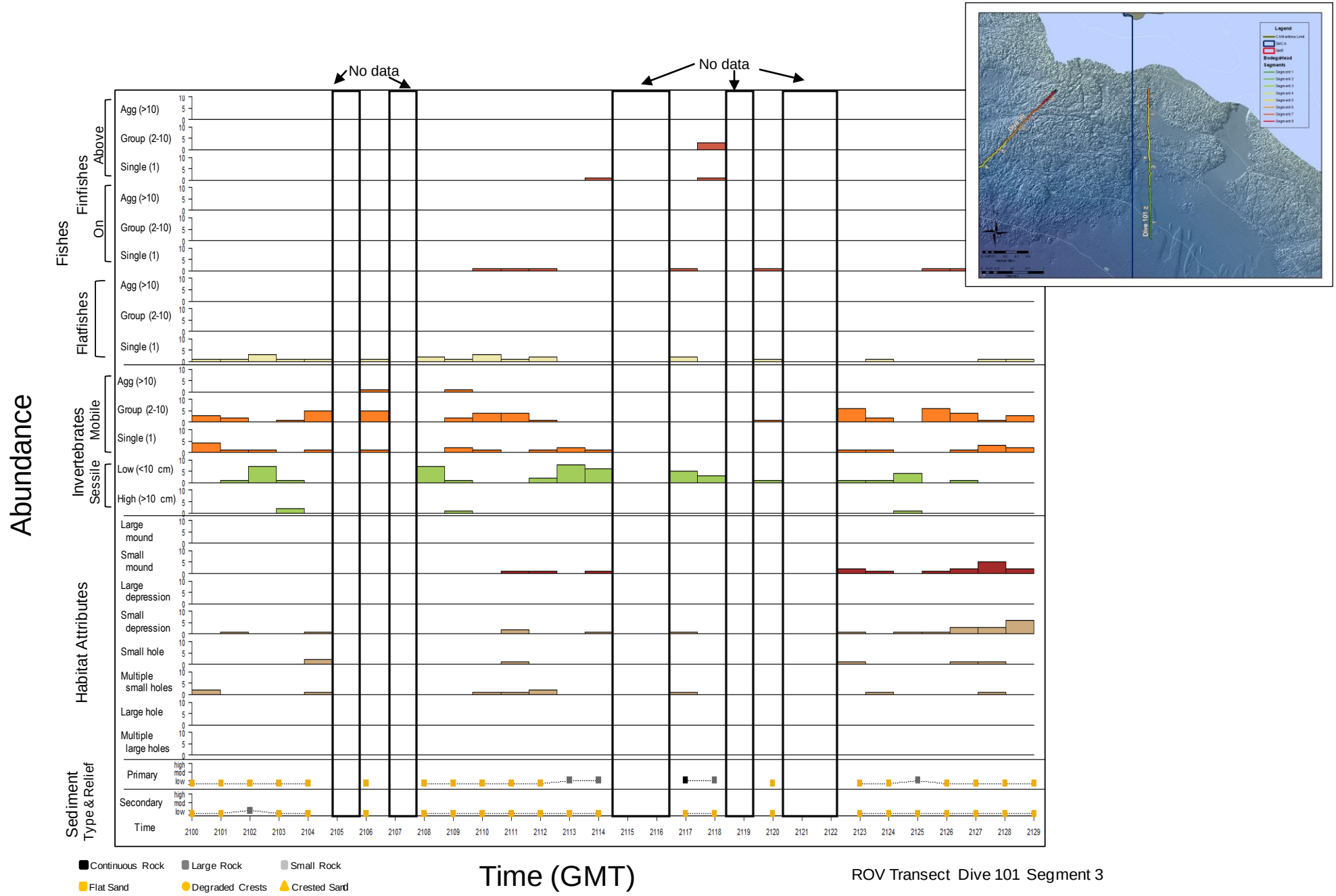

No data
No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2100
2101
2102
2103
2104
2105
2106
2107
2108
2109
2110
2111
2112
2113
2114
2115
2116
2117
2118
2119
2120
2121
2122
2123
2124
2125
2126
2127
2128
2129
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 101 Segment 3

Figure 101

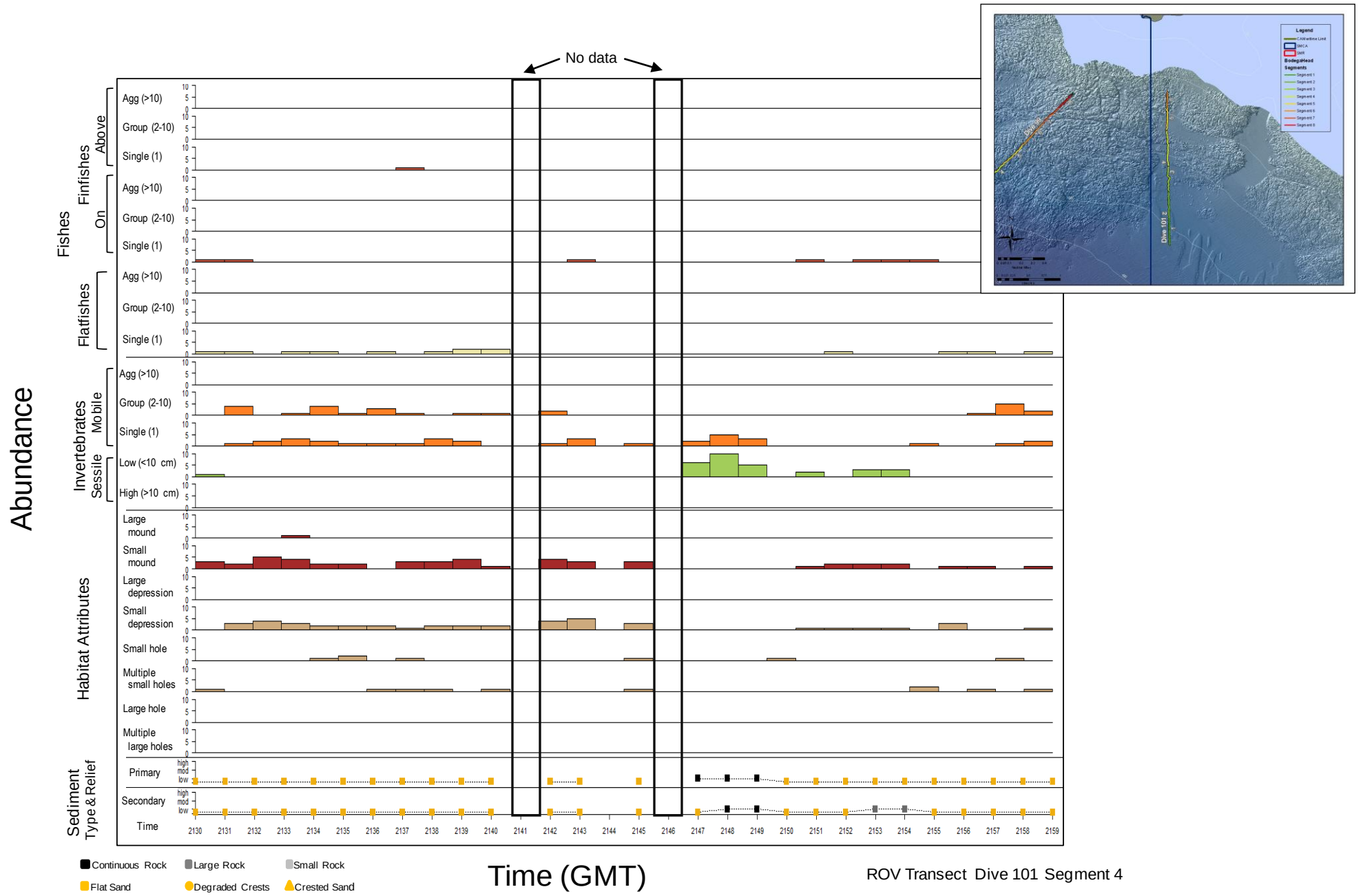

No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
2130
2131
2132
2133
2134
2135
2136
2137
2138
2139
2140
2141
2142
2143
2144
2145
2146
2147
2148
2149
2150
2151
2152
2153
2154
2155
2156
2157
2158
2159
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 101 Segment 4

Figure 102

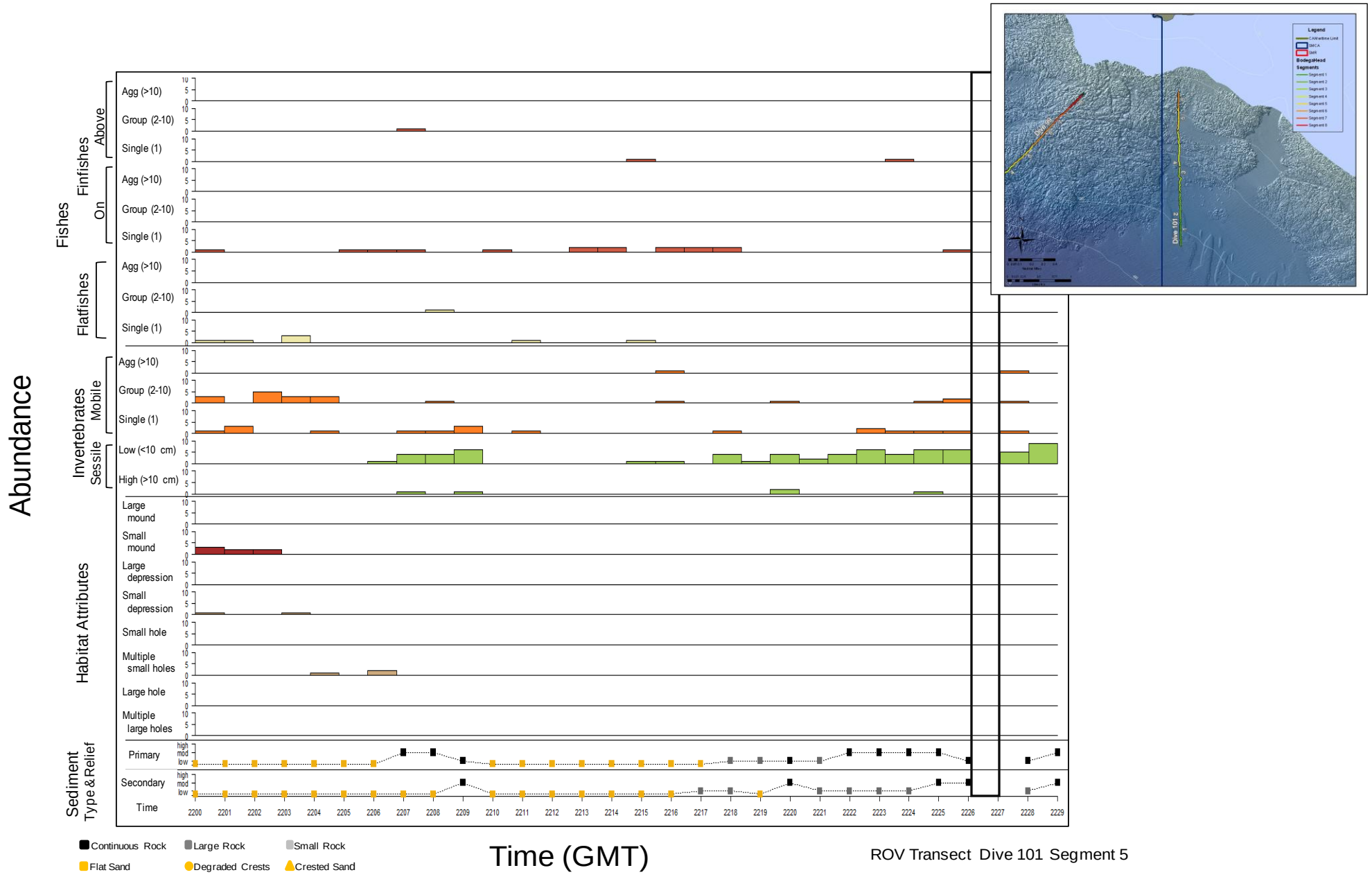

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2200 2201 2202 2203 2204 2205 2206 2207 2208 2209 2210 2211 2212 2213 2214 2215 2216 2217 2218 2219 2220 2221 2222 2223 2224 2225 2226 2227 2228 2229
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 101 Segment 5
Legend
Bodega Head
Segments
Dive 101 2

Figure 103

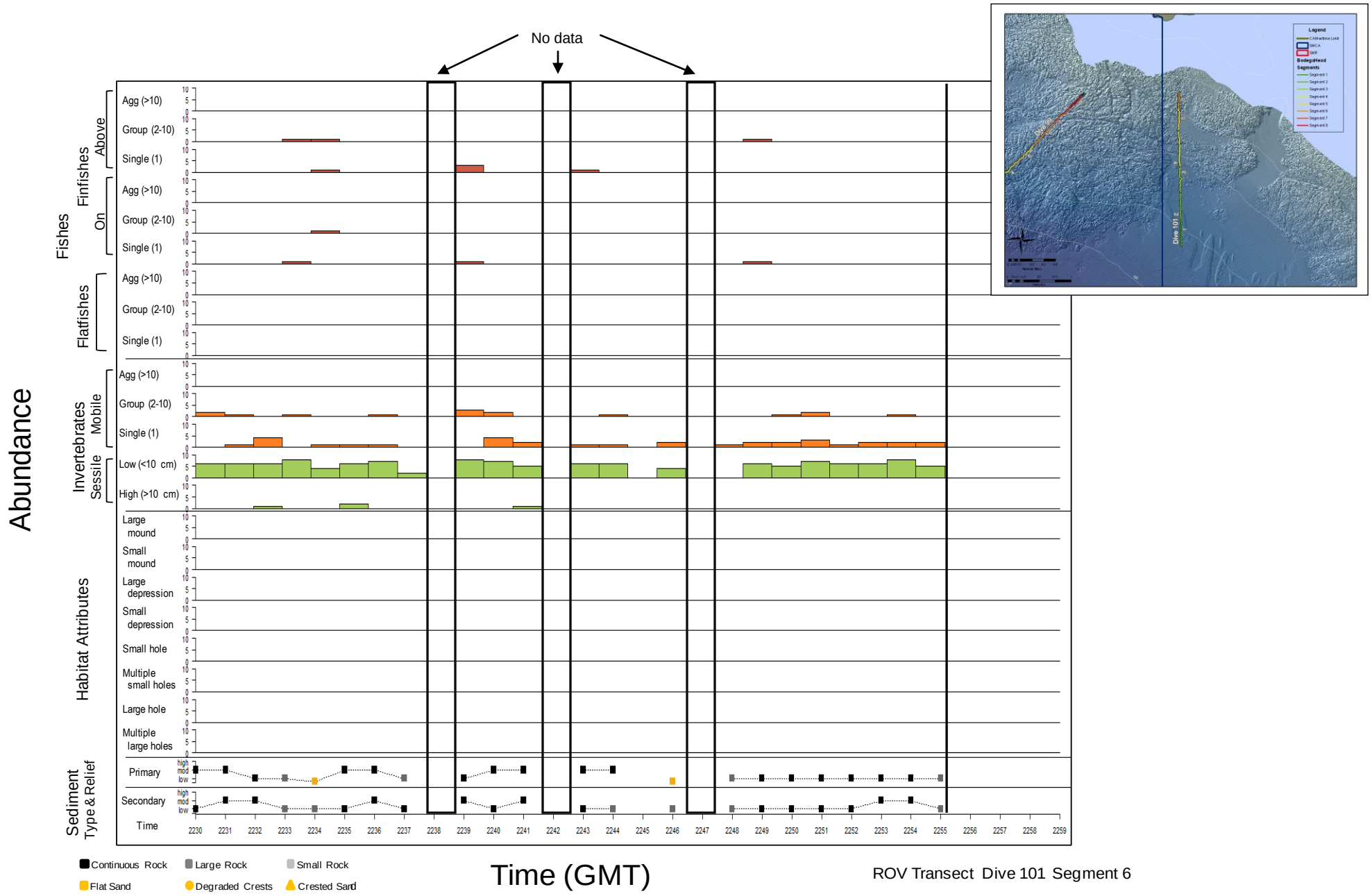

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
2230 2231 2232 2233 2234 2235 2236 2237 2238 2239 2240 2241 2242 2243 2244 2245 2246 2247 2248 2249 2250 2251 2252 2253 2254 2255 2256 2257 2258 2259
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 101 Segment 6

Figure 104

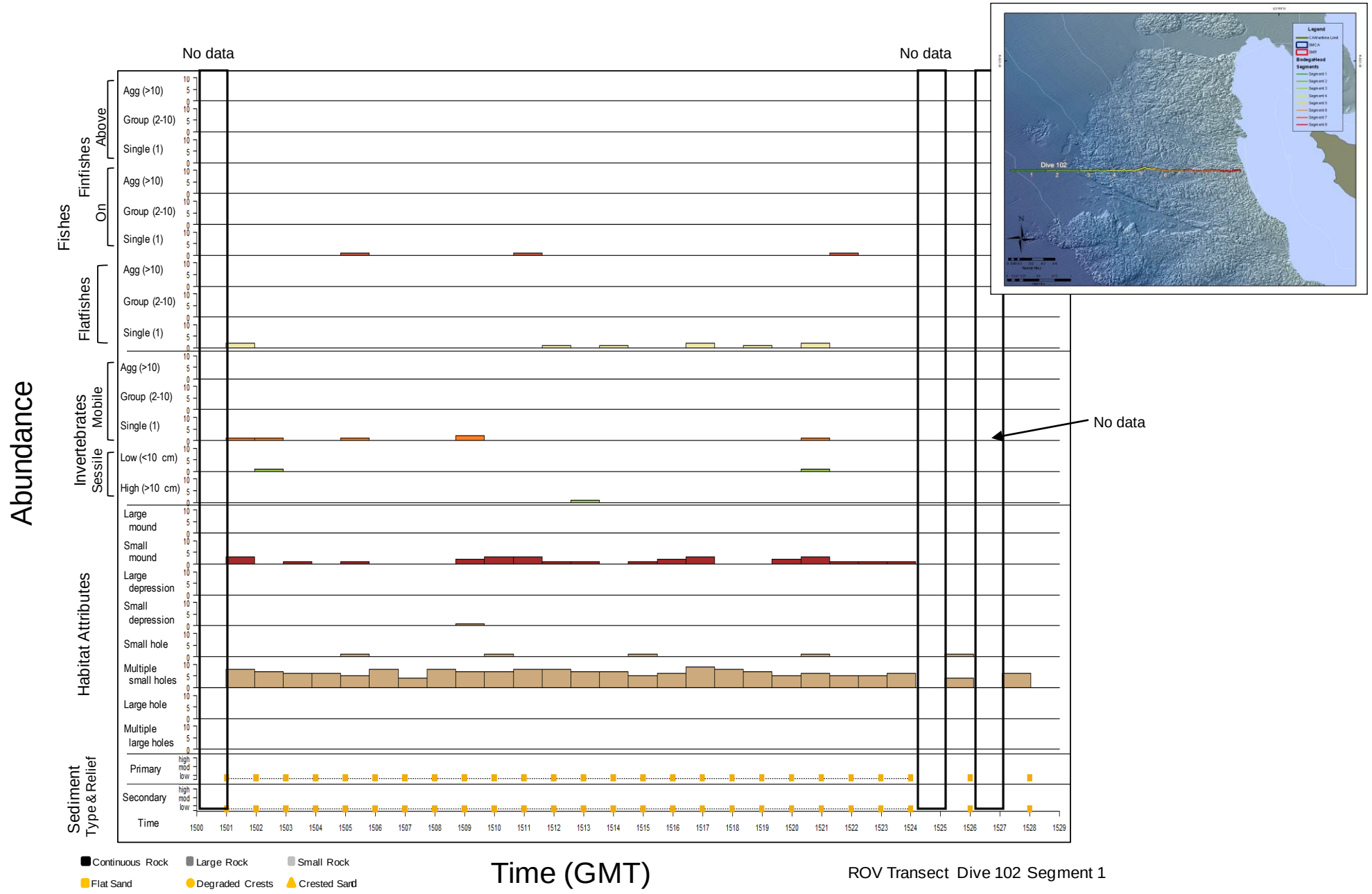

No data
No data
No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
1500 1501 1502 1503 1504 1505 1506 1507 1508 1509 1510 1511 1512 1513 1514 1515 1516 1517 1518 1519 1520 1521 1522 1523 1524 1525 1526 1527 1528 1529
Dive 102
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 102 Segment 1

Figure 105

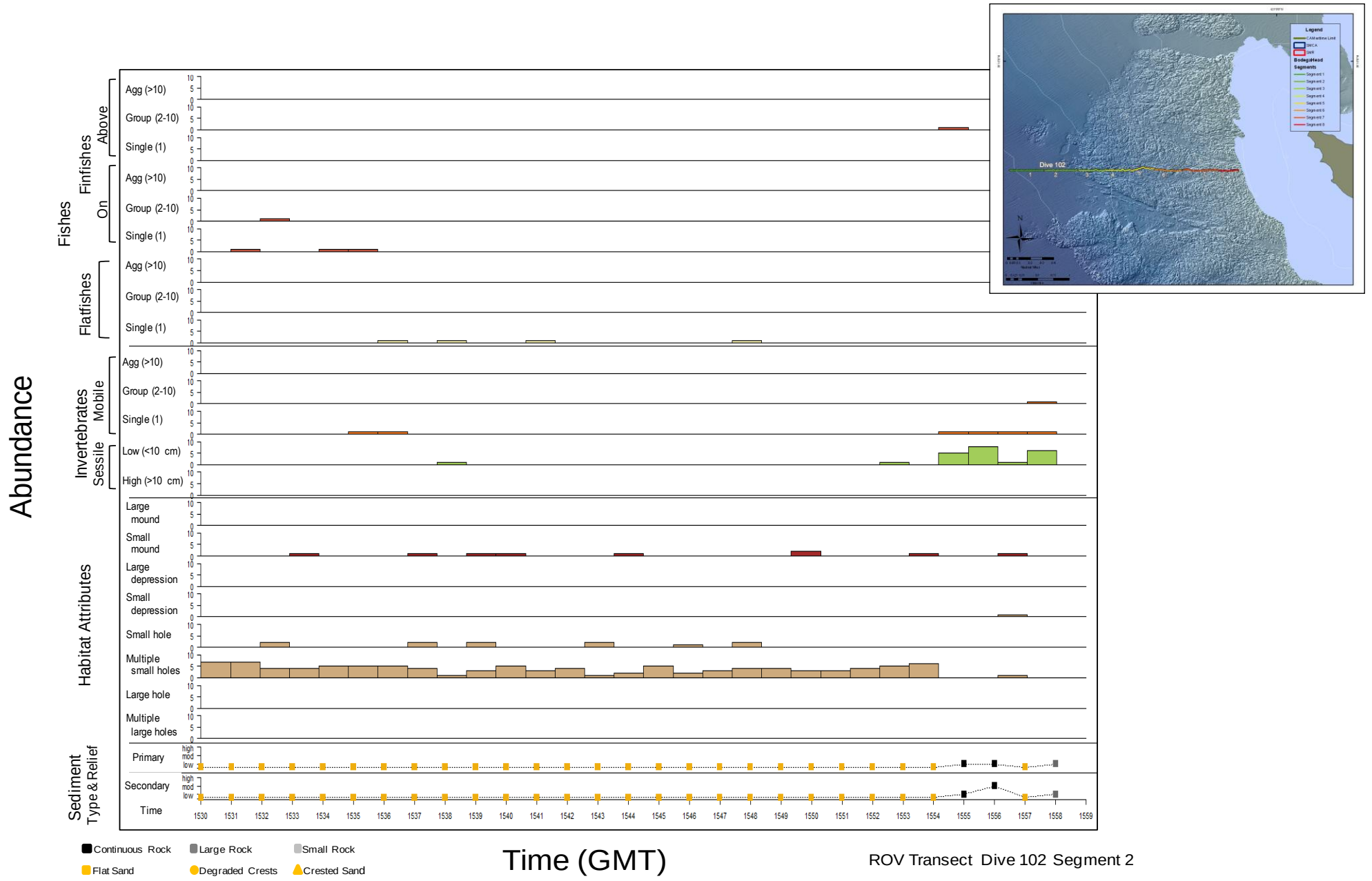

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1530 1531 1532 1533 1534 1535 1536 1537 1538 1539 1540 1541 1542 1543 1544 1545 1546 1547 1548 1549 1550 1551 1552 1553 1554 1555 1556 1557 1558 1559
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 102 Segment 2
Legend
Dive 102

Figure 106

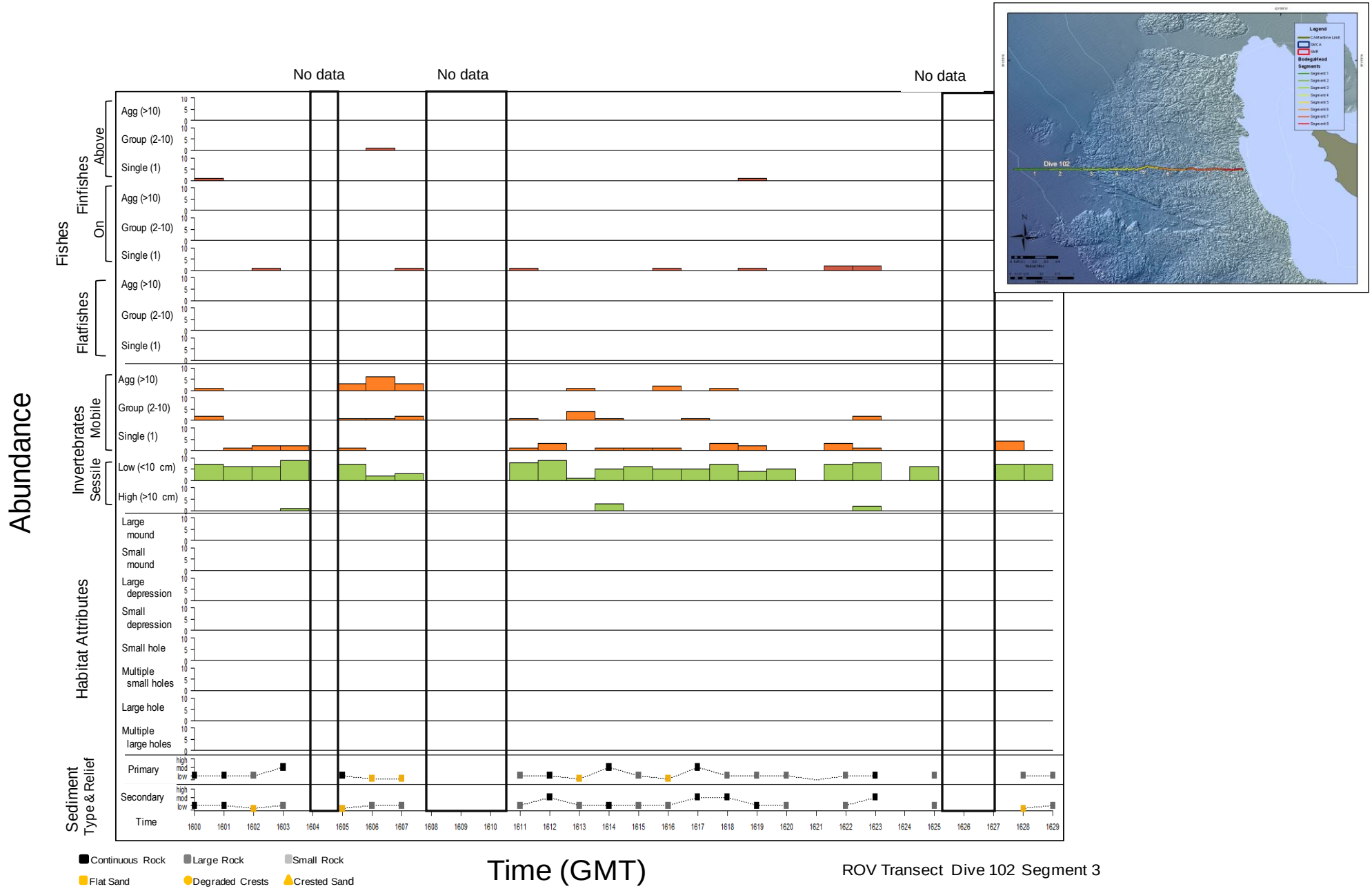

No data
No data
No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Invertebrates
Mobile
Sessile
Habitat Attributes
Sediment
Type & Relief
Agg (>10)
Group (2-10)
Single (1)
Low (<10 cm)
High (>10 cm)
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Primary
Secondary
Time
high
mod
low
1600
1601
1602
1603
1604
1605
1606
1607
1608
1609
1610
1611
1612
1613
1614
1615
1616
1617
1618
1619
1620
1621
1622
1623
1624
1625
1626
1627
1628
1629
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 102 Segment 3
Legend
Dive 102

Figure 107

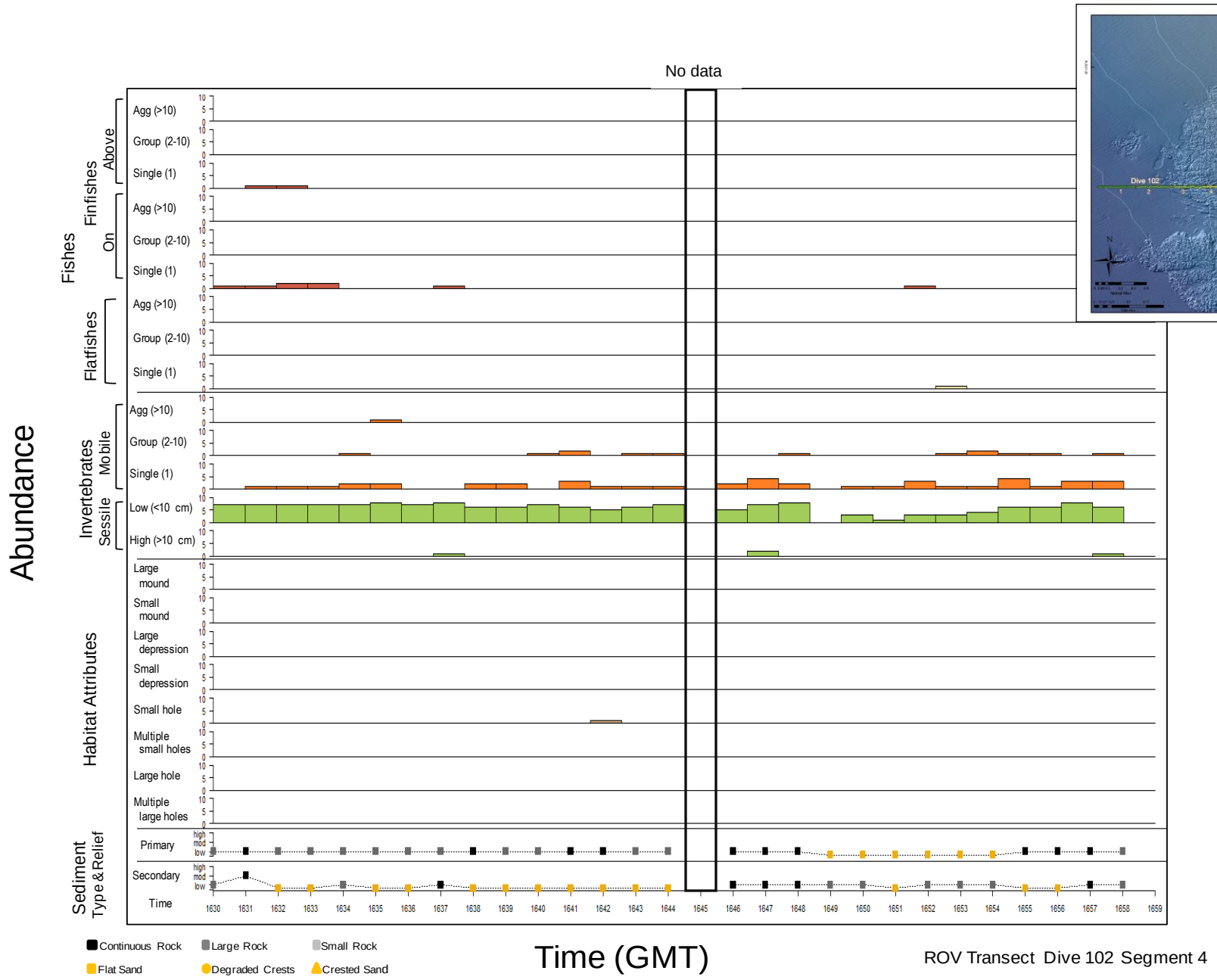

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1630 1631 1632 1633 1634 1635 1636 1637 1638 1639 1640 1641 1642 1643 1644 1645 1646 1647 1648 1649 1650 1651 1652 1653 1654 1655 1656 1657 1658 1659
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 102 Segment 4
Legend
Dive 102

Figure 108

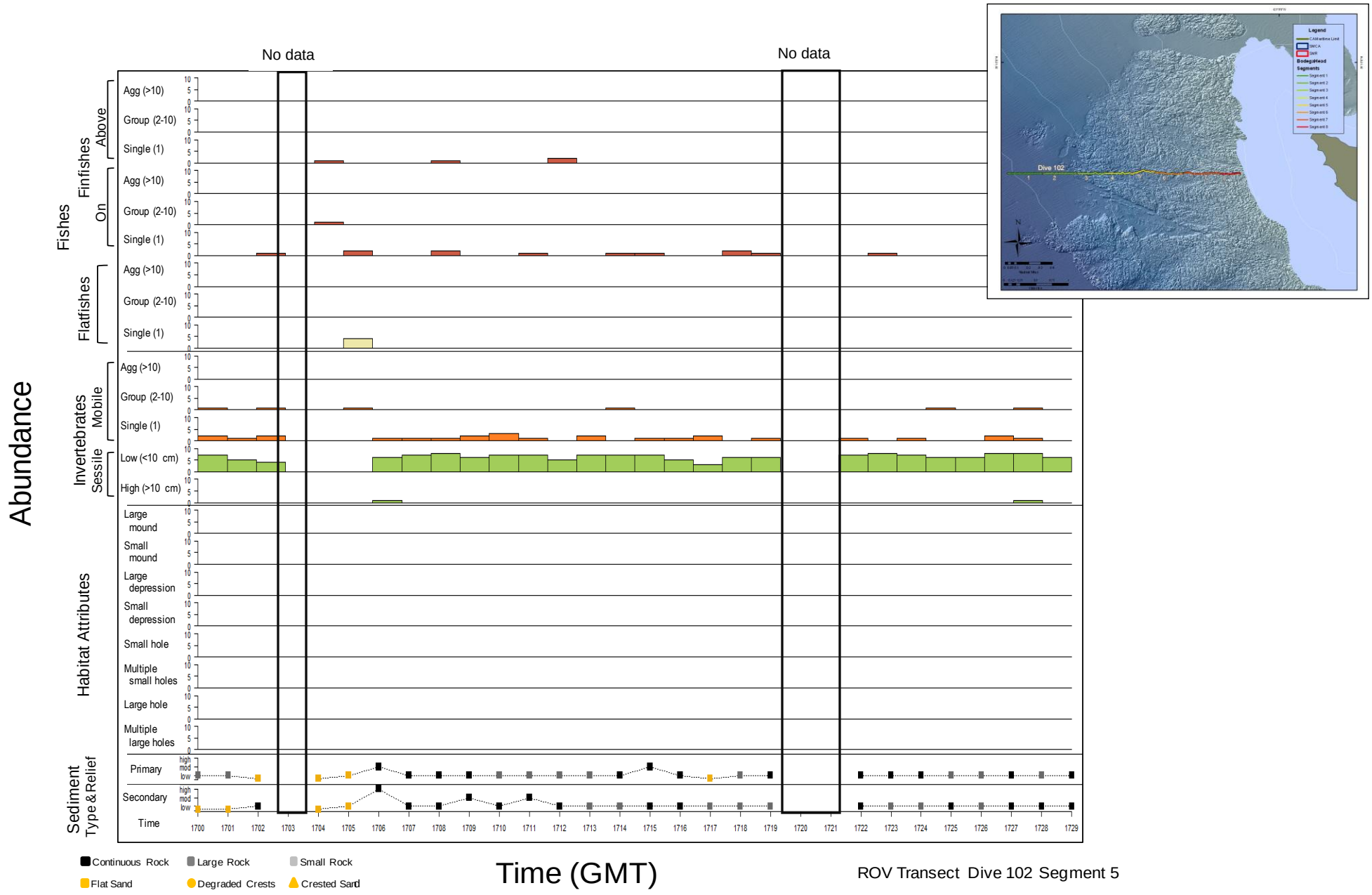

No data
No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1700 1701 1702 1703 1704 1705 1706 1707 1708 1709 1710 1711 1712 1713 1714 1715 1716 1717 1718 1719 1720 1721 1722 1723 1724 1725 1726 1727 1728 1729
Dive 102
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 102 Segment 5

Figure 109

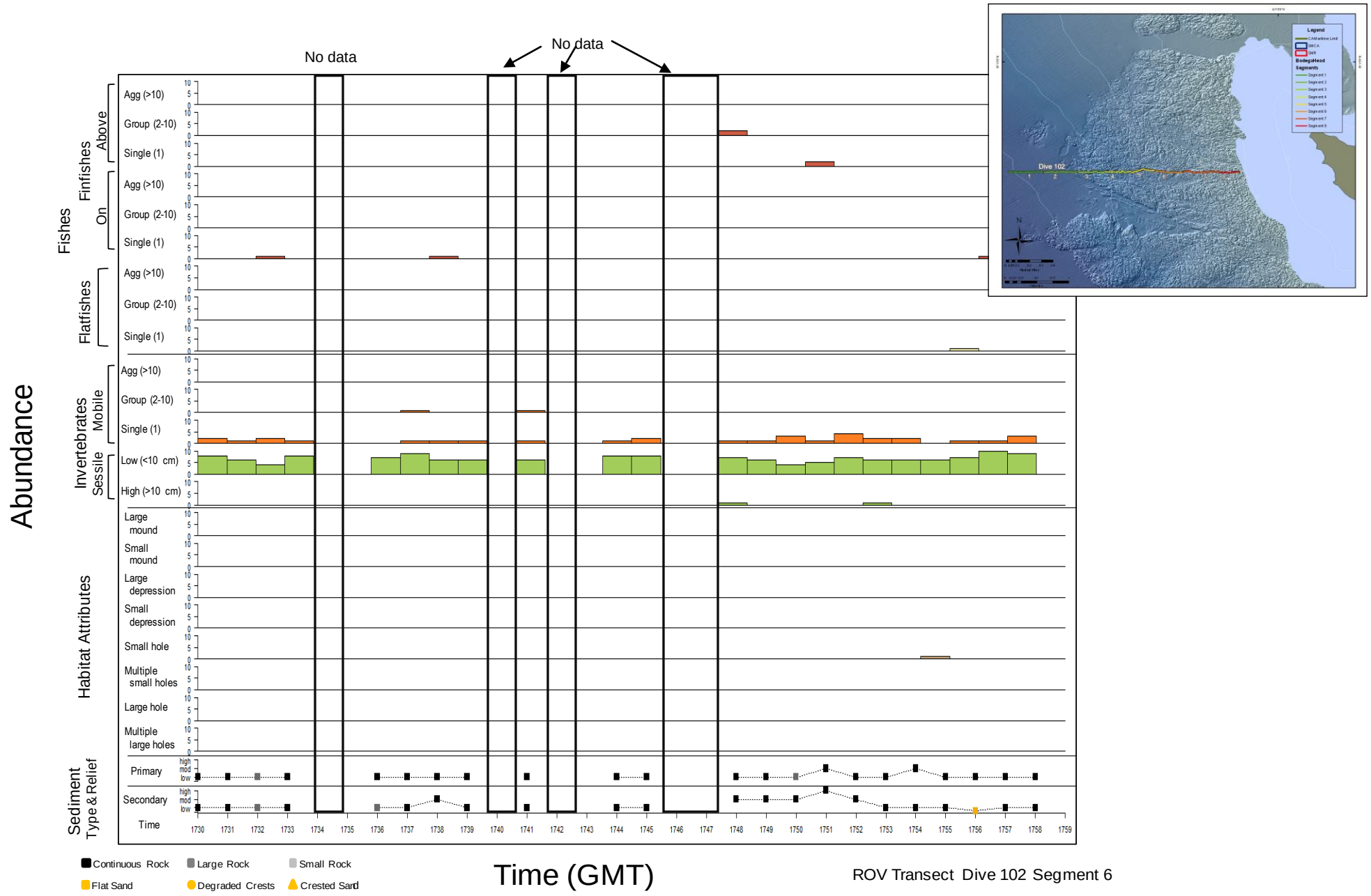

No data
No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Invertebrates
Mobile
Sessile
Habitat Attributes
Sediment
Type & Relief
Agg (>10)
Group (2-10)
Single (1)
Low (<10 cm)
High (>10 cm)
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Primary
Secondary
high
mod
low
Time
1730 1731 1732 1733 1734 1735 1736 1737 1738 1739 1740 1741 1742 1743 1744 1745 1746 1747 1748 1749 1750 1751 1752 1753 1754 1755 1756 1757 1758 1759
Dive 102
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 102 Segment 6

Figure 110

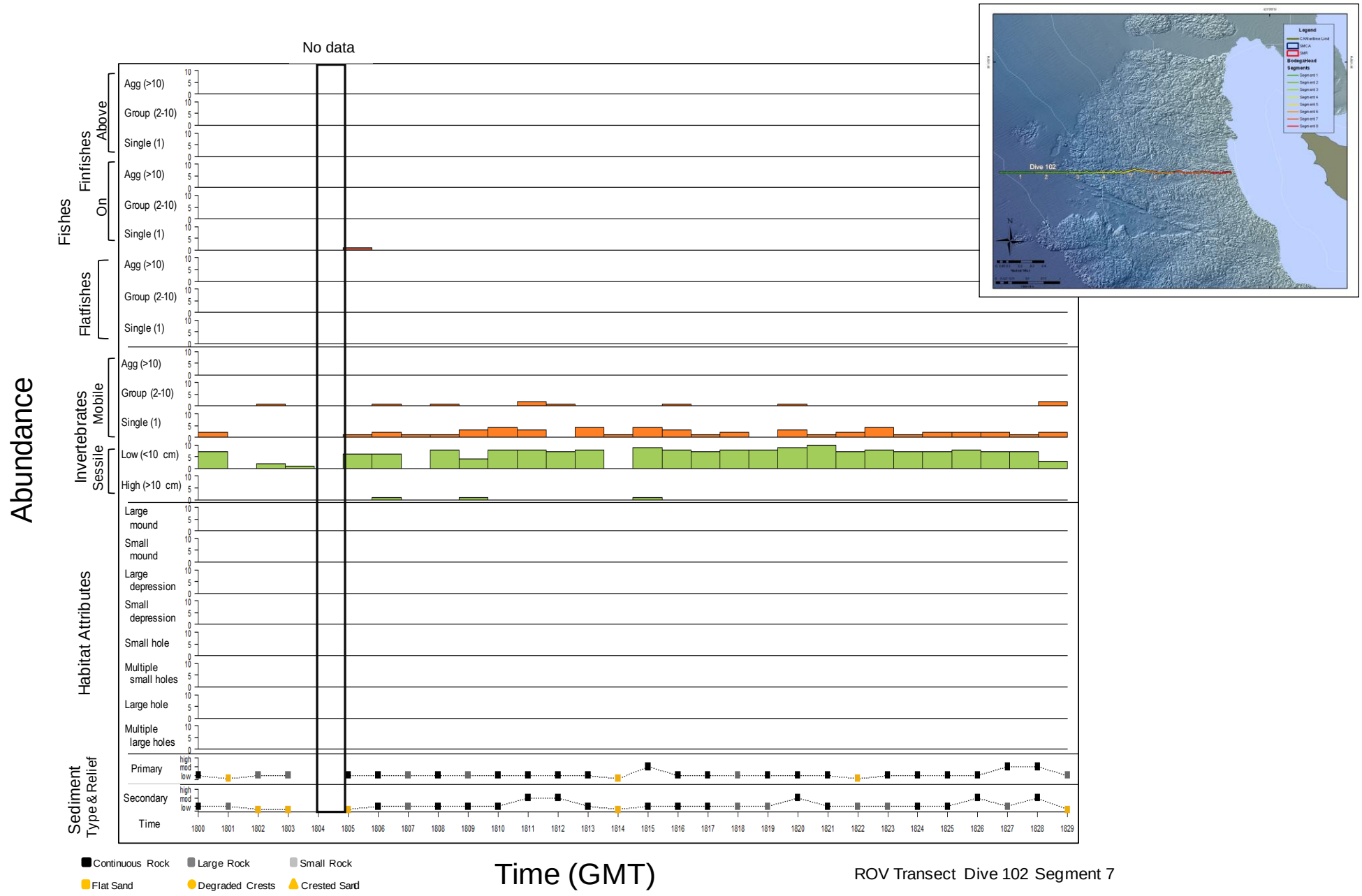

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
1800 1801 1802 1803 1804 1805 1806 1807 1808 1809 1810 1811 1812 1813 1814 1815 1816 1817 1818 1819 1820 1821 1822 1823 1824 1825 1826 1827 1828 1829
Dive 102
Legend
BodegaHead Segments
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 102 Segment 7

Figure 111

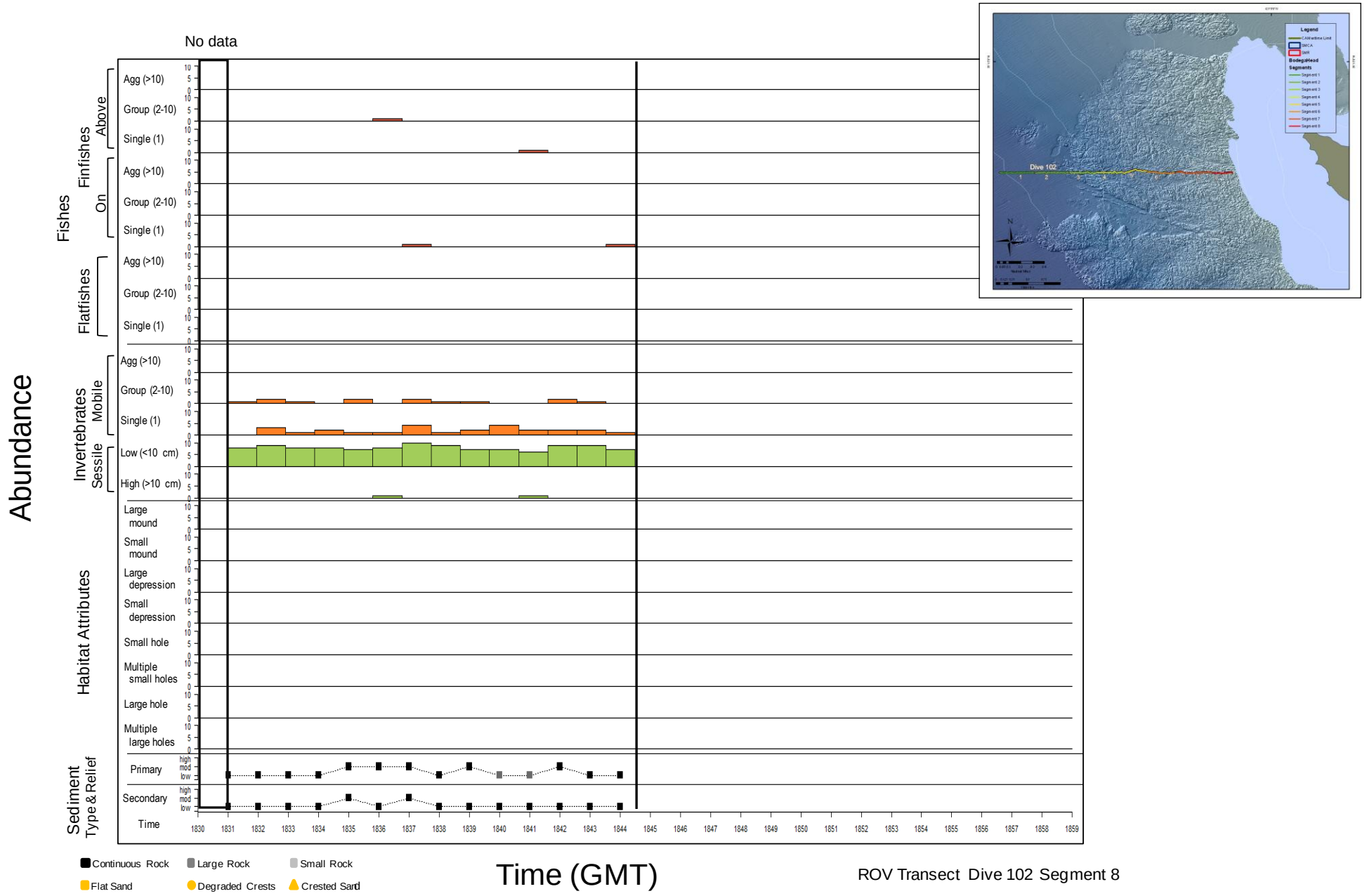

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
1830
1831
1832
1833
1834
1835
1836
1837
1838
1839
1840
1841
1842
1843
1844
1845
1846
1847
1848
1849
1850
1851
1852
1853
1854
1855
1856
1857
1858
1859
Dive 102
Legend
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 102 Segment 8

Figure 112

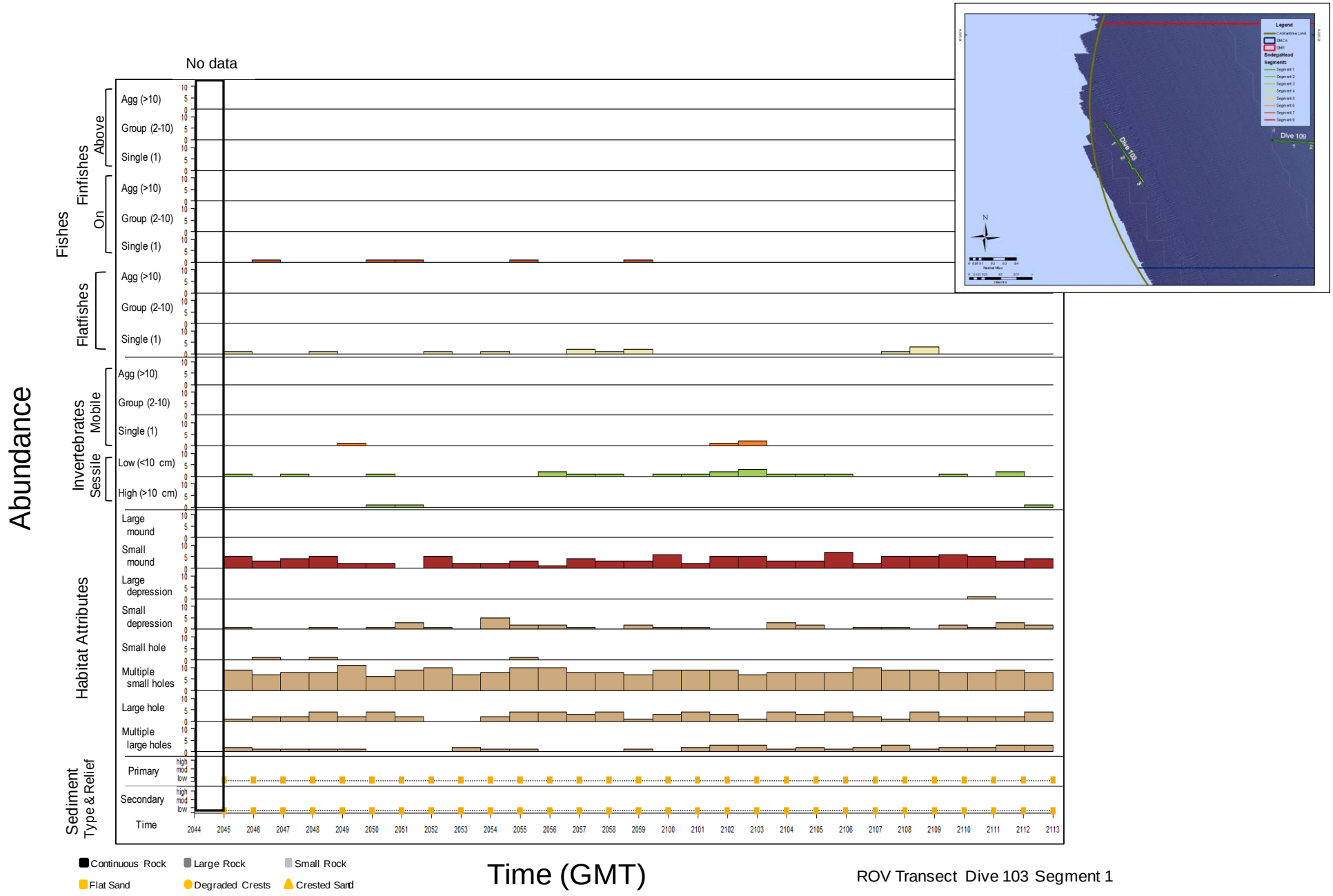

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2044
2045
2046
2047
2048
2049
2050
2051
2052
2053
2054
2055
2056
2057
2058
2059
2100
2101
2102
2103
2104
2105
2106
2107
2108
2109
2110
2111
2112
2113
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 103 Segment 1
Legend
Dive 103
Dive 109

Figure 113

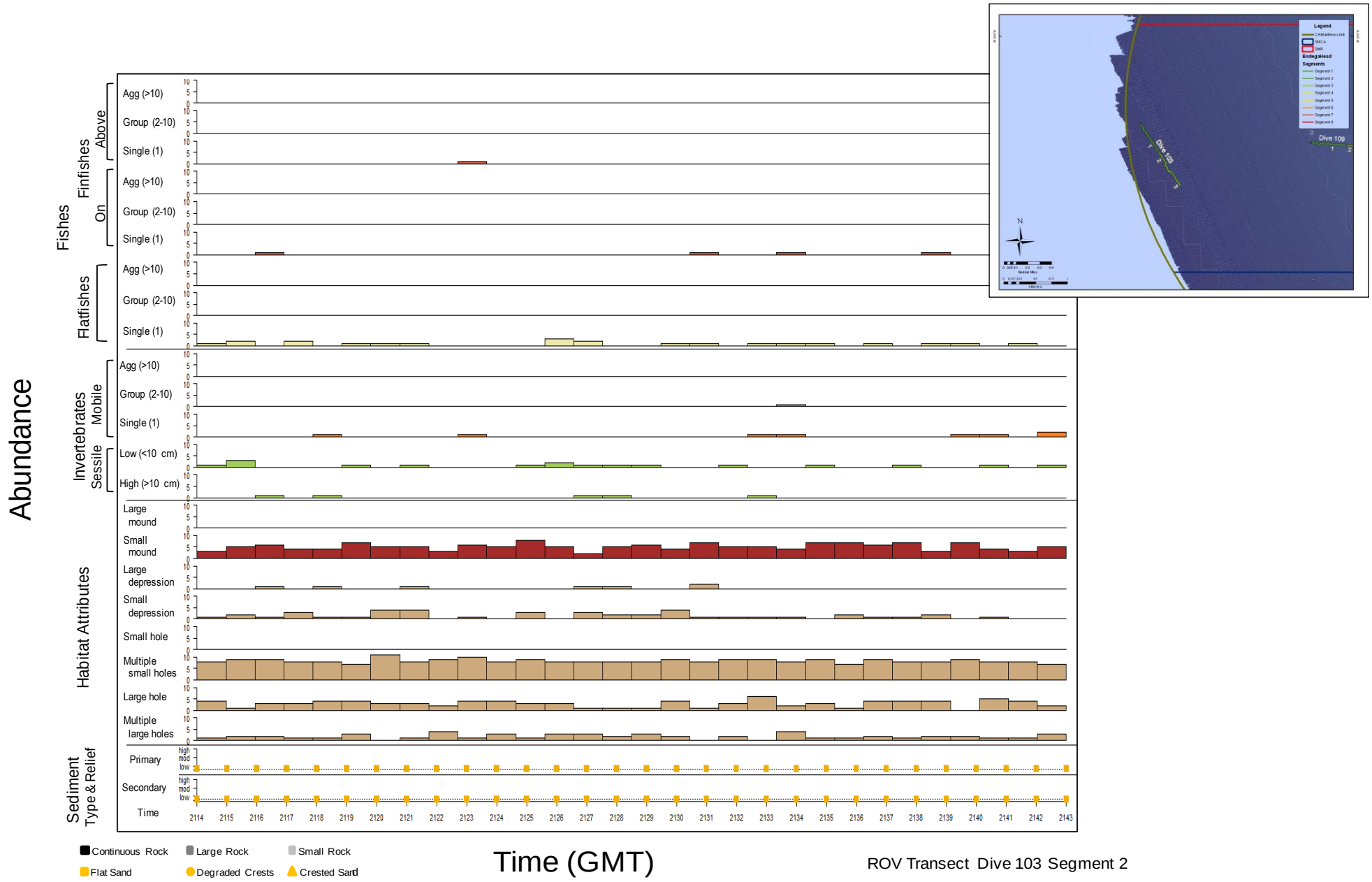

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
2114 2115 2116 2117 2118 2119 2120 2121 2122 2123 2124 2125 2126 2127 2128 2129 2130 2131 2132 2133 2134 2135 2136 2137 2138 2139 2140 2141 2142 2143
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 103 Segment 2
Legend
Dive 103
Dive 109

Figure 114

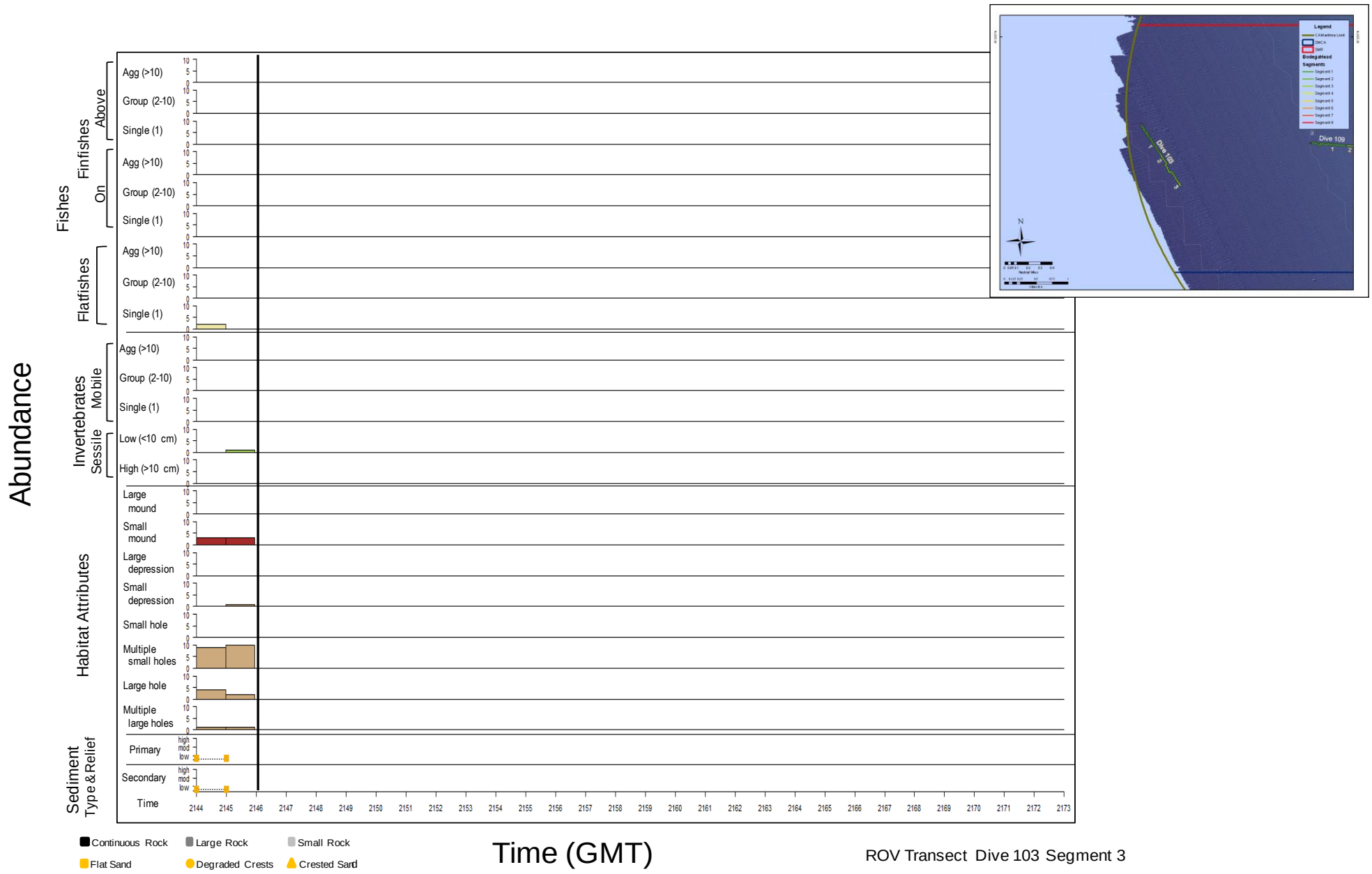

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2144
2145
2146
2147
2148
2149
2150
2151
2152
2153
2154
2155
2156
2157
2158
2159
2160
2161
2162
2163
2164
2165
2166
2167
2168
2169
2170
2171
2172
2173
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 103 Segment 3
Legend
Dive 103
Dive 109
N

Figure 115

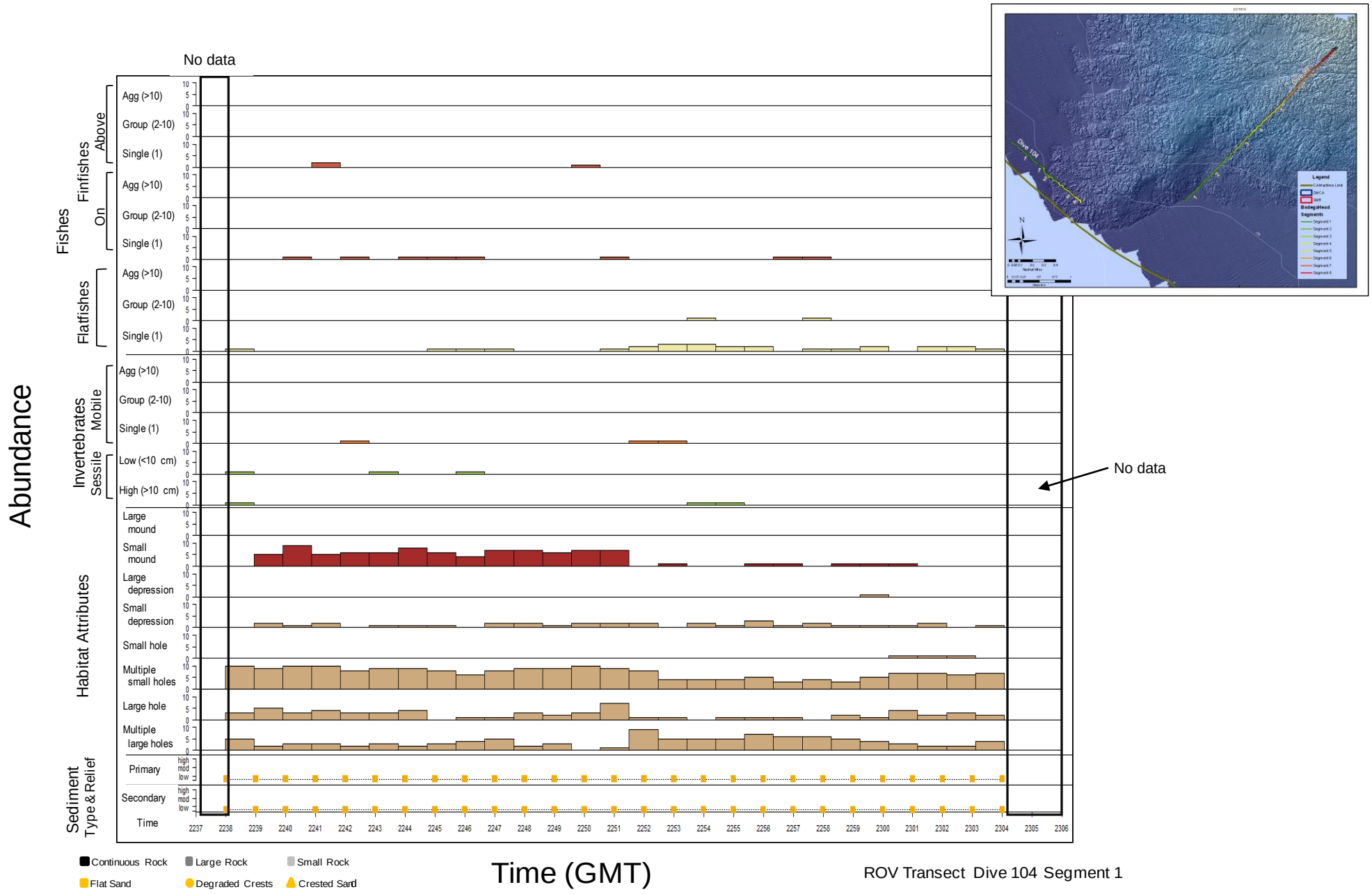

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2237
2238
2239
2240
2241
2242
2243
2244
2245
2246
2247
2248
2249
2250
2251
2252
2253
2254
2255
2256
2257
2258
2259
2300
2301
2302
2303
2304
2305
2306
No data
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 104 Segment 1

Figure 116

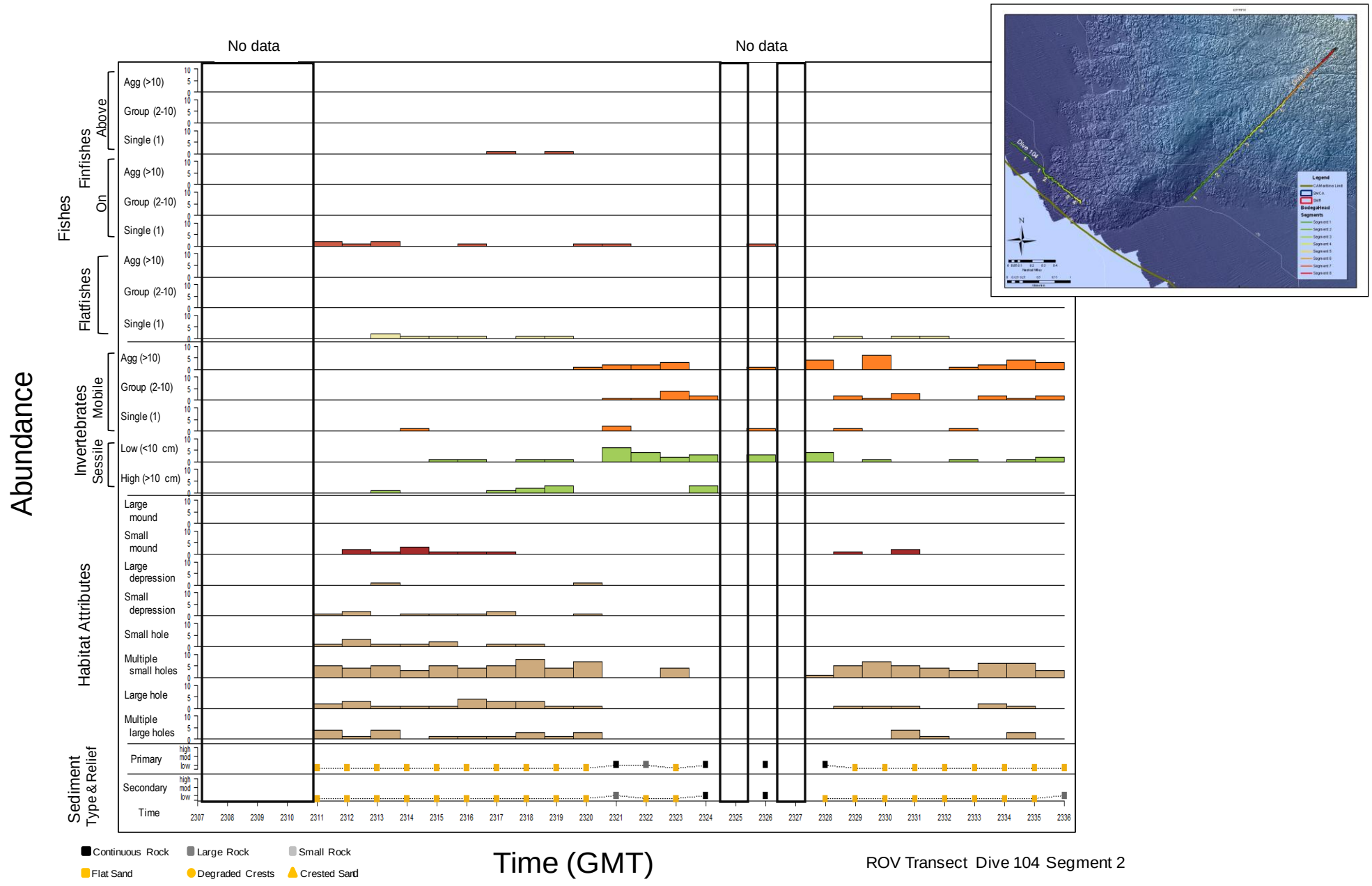

No data
No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2307
2308
2309
2310
2311
2312
2313
2314
2315
2316
2317
2318
2319
2320
2321
2322
2323
2324
2325
2326
2327
2328
2329
2330
2331
2332
2333
2334
2335
2336
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 104 Segment 2

Figure 117

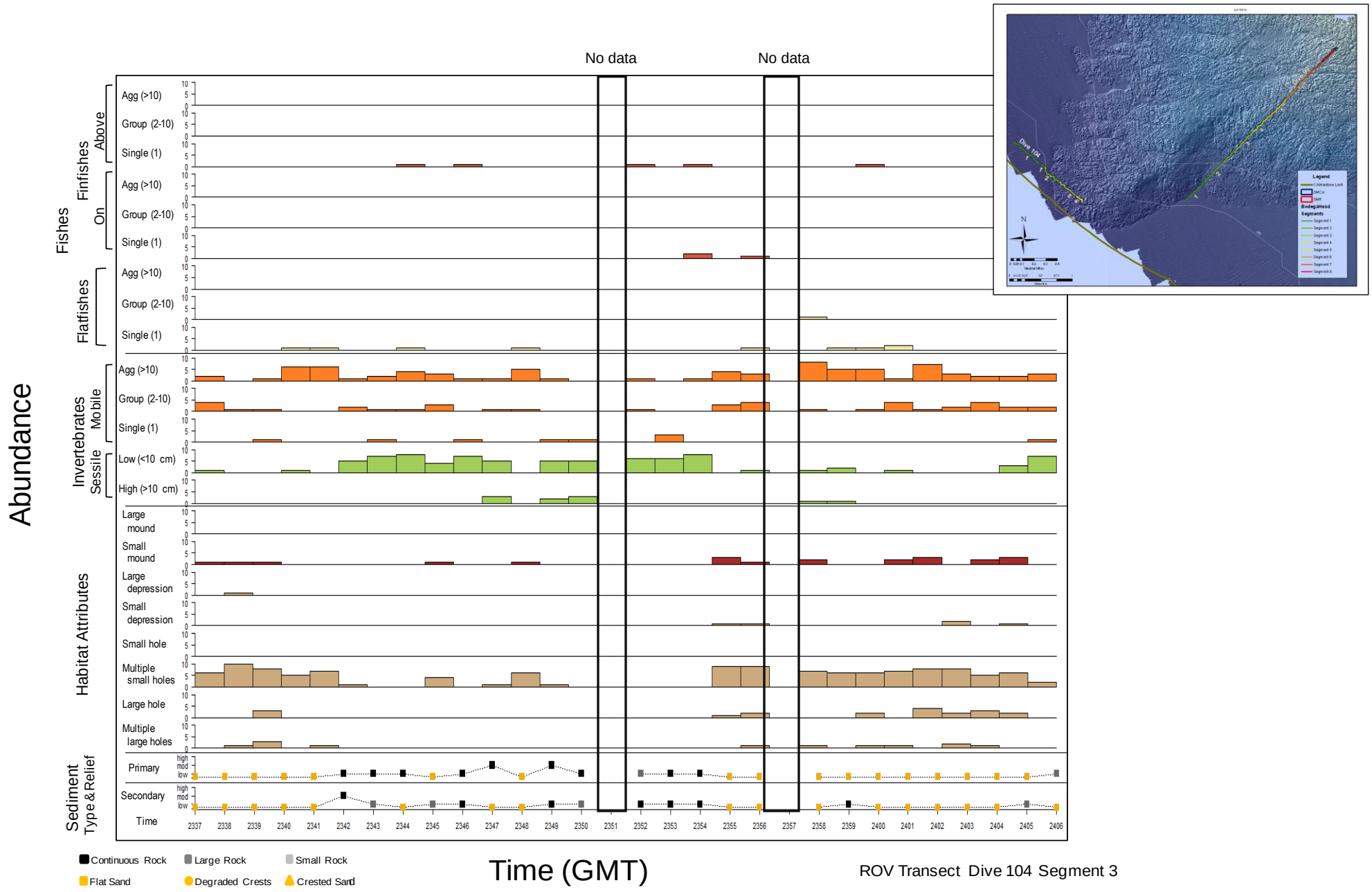

No data
No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2337
2338
2339
2340
2341
2342
2343
2344
2345
2346
2347
2348
2349
2350
2351
2352
2353
2354
2355
2356
2357
2358
2359
2400
2401
2402
2403
2404
2405
2406
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 104 Segment 3

Figure 118

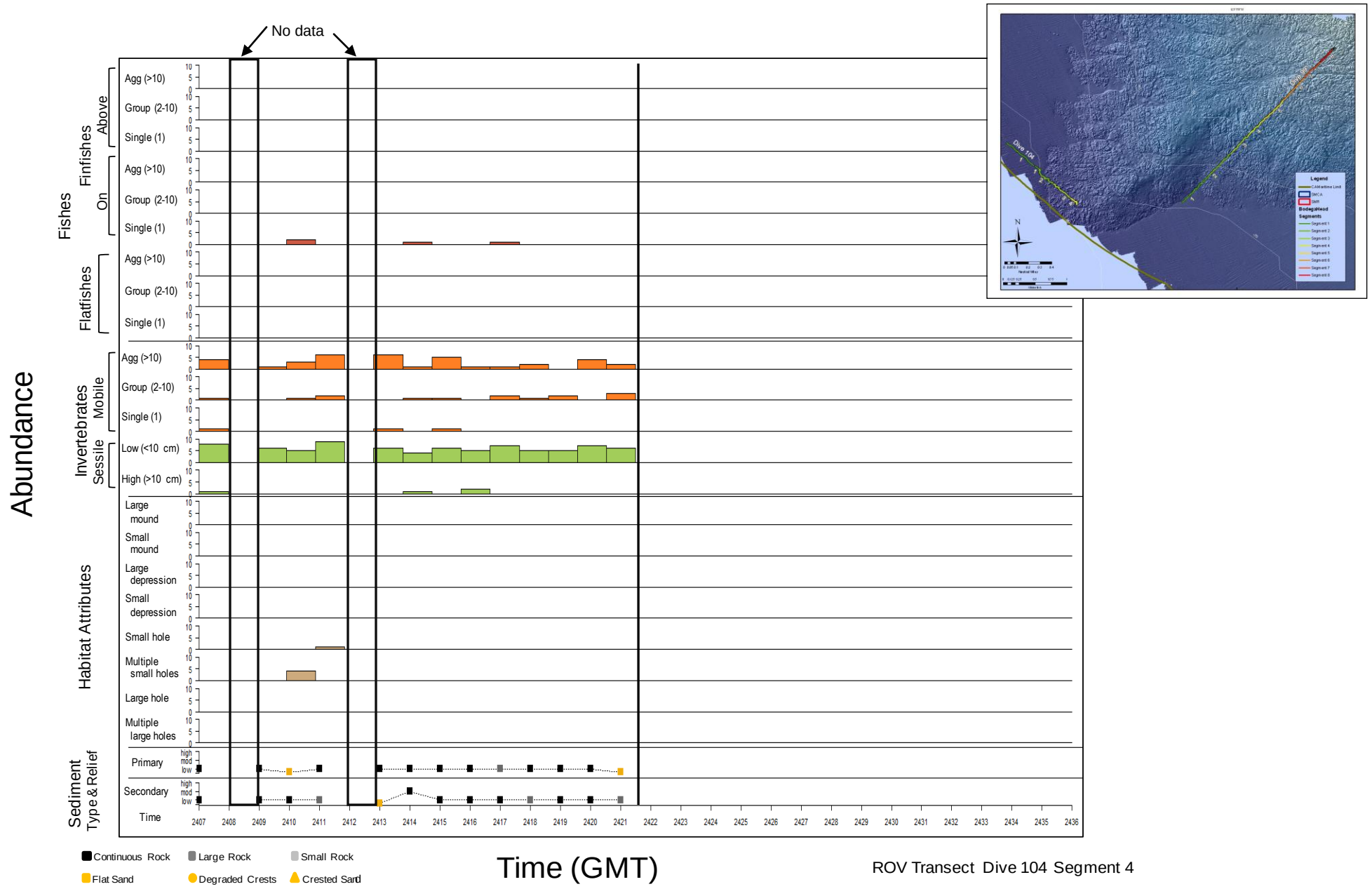

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
2407 2408 2409 2410 2411 2412 2413 2414 2415 2416 2417 2418 2419 2420 2421 2422 2423 2424 2425 2426 2427 2428 2429 2430 2431 2432 2433 2434 2435 2436
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 104 Segment 4

Figure 119

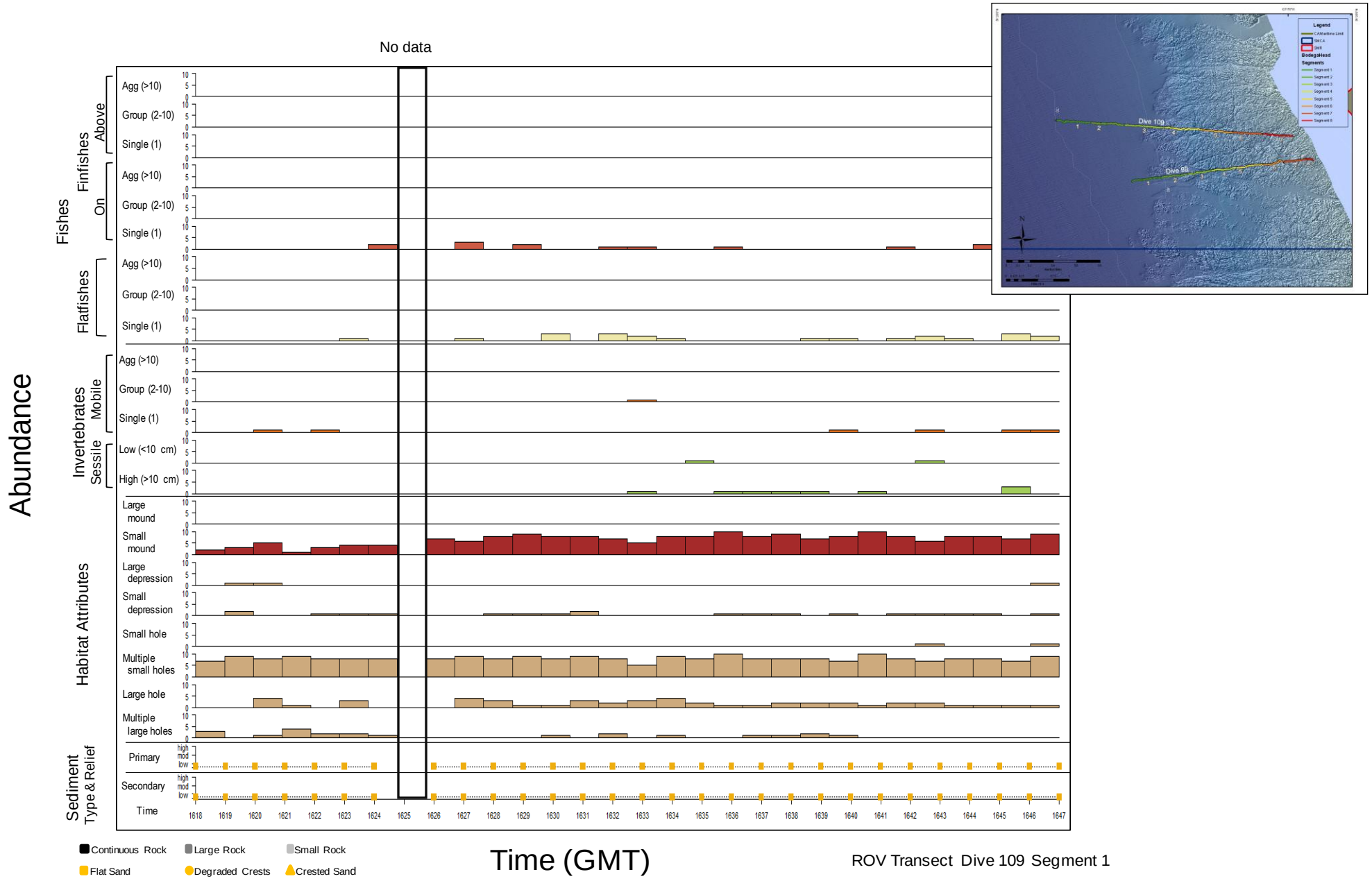

No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
1618 1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1629 1630 1631 1632 1633 1634 1635 1636 1637 1638 1639 1640 1641 1642 1643 1644 1645 1646 1647
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 109 Segment 1
Dive 109
Dive 88
Legend
BodegaHead
Segments

Figure 120

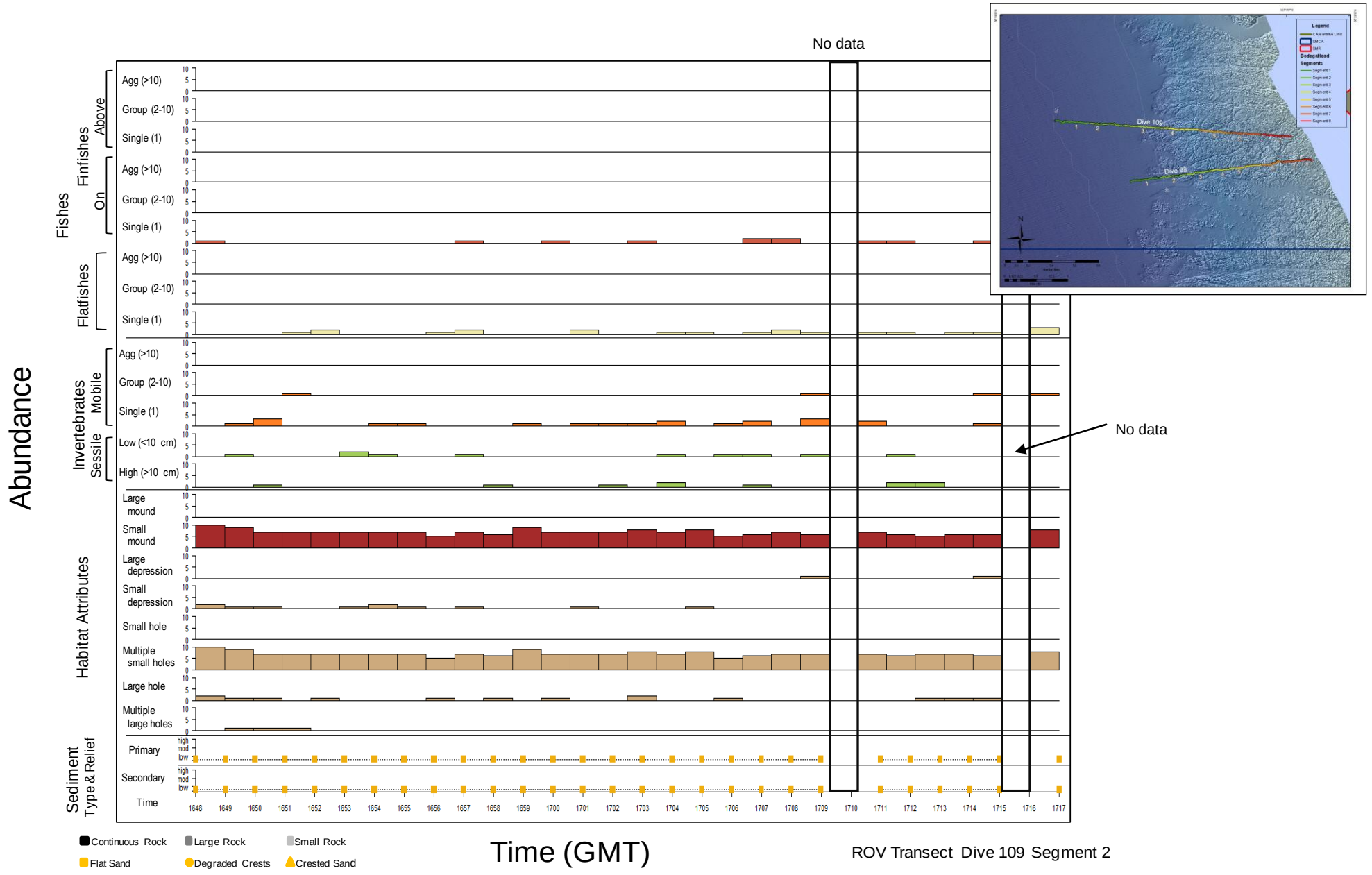

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1648
1649
1650
1651
1652
1653
1654
1655
1656
1657
1658
1659
1700
1701
1702
1703
1704
1705
1706
1707
1708
1709
1710
1711
1712
1713
1714
1715
1716
1717
No data
Dive 109
Dive 88
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 109 Segment 2

Figure 121

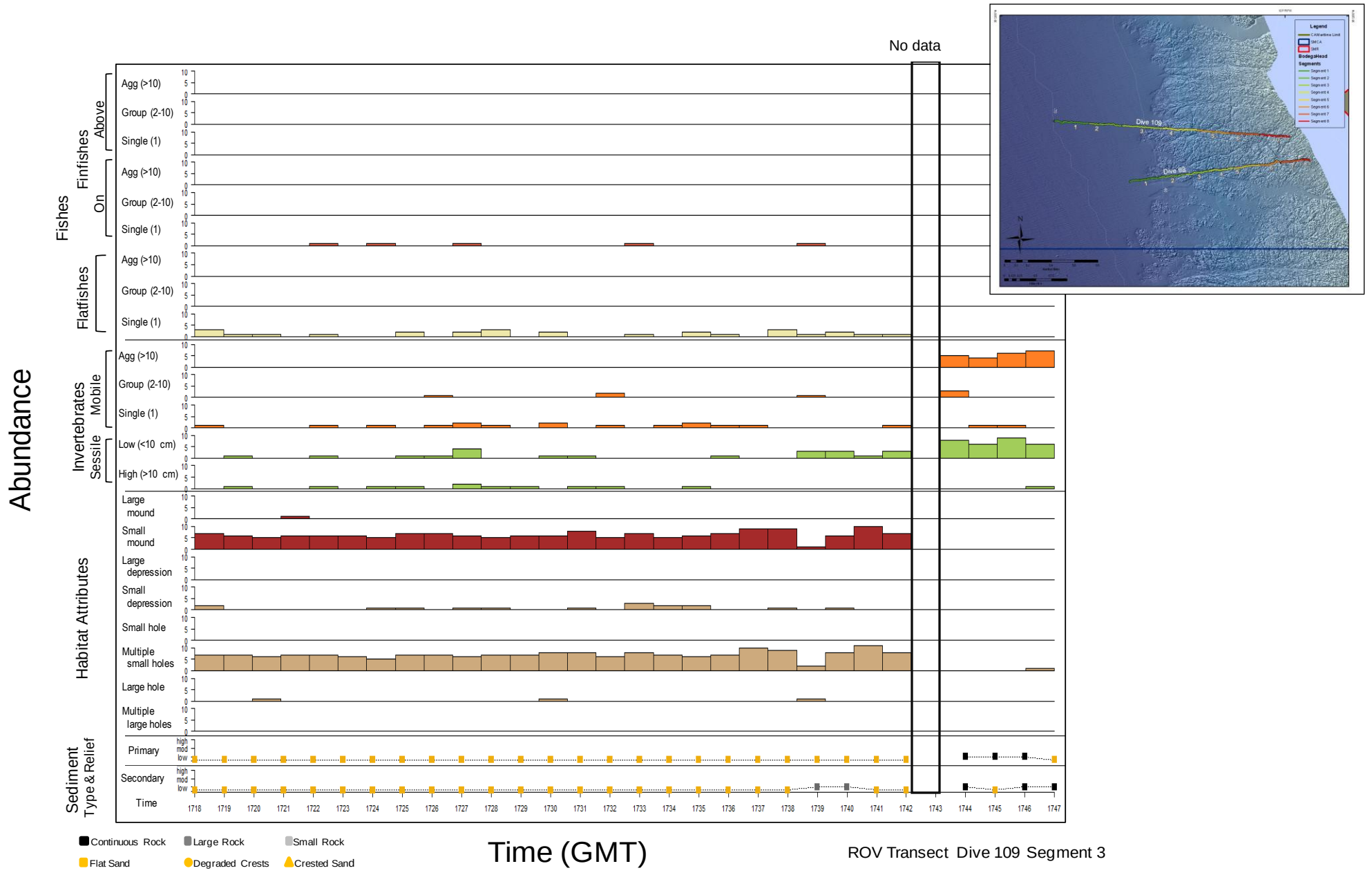

No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1718 1719 1720 1721 1722 1723 1724 1725 1726 1727 1728 1729 1730 1731 1732 1733 1734 1735 1736 1737 1738 1739 1740 1741 1742 1743 1744 1745 1746 1747
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 109 Segment 3
Legend
Dive 109
Dive 99

Figure 122

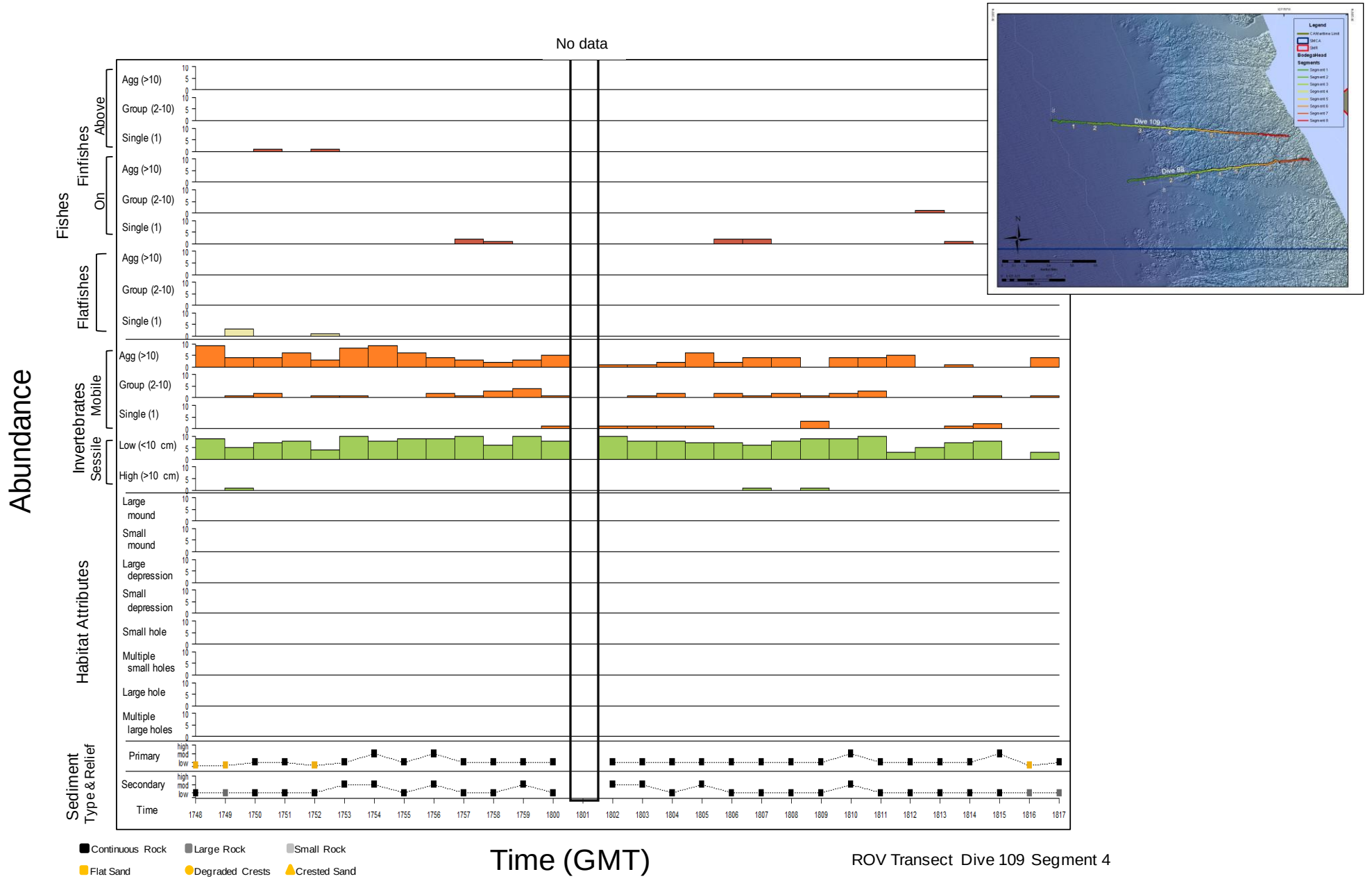

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type & Relief
Primary
Secondary
high
mod
low
Time
1748 1749 1750 1751 1752 1753 1754 1755 1756 1757 1758 1759 1800 1801 1802 1803 1804 1805 1806 1807 1808 1809 1810 1811 1812 1813 1814 1815 1816 1817
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 109 Segment 4
Legend
Bodega Head
Segments
Dive 109
Dive 99

Figure 123

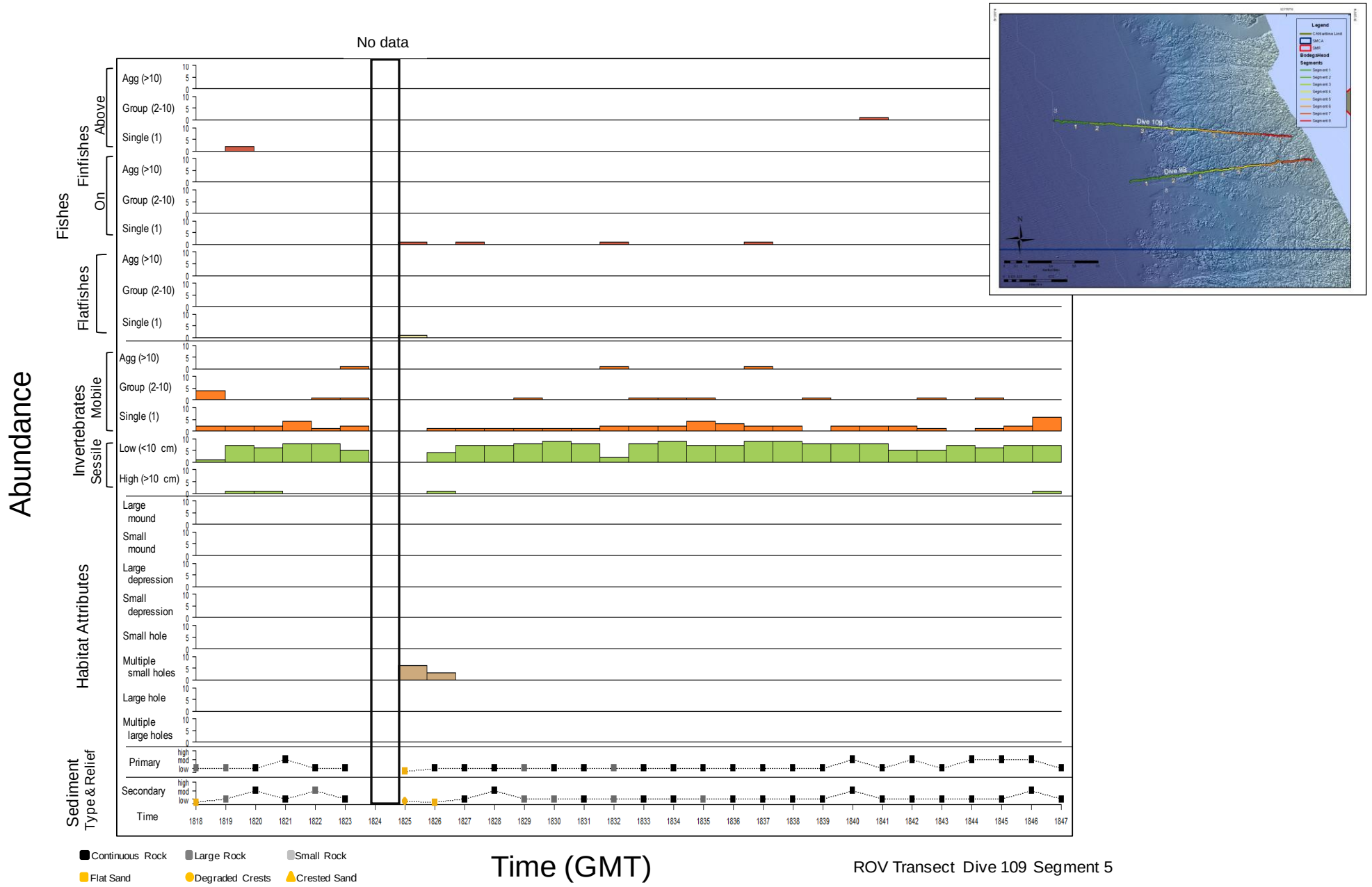

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1818 1819 1820 1821 1822 1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1843 1844 1845 1846 1847
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 109 Segment 5
Legend
Dive 109
Dive 99

Figure 124

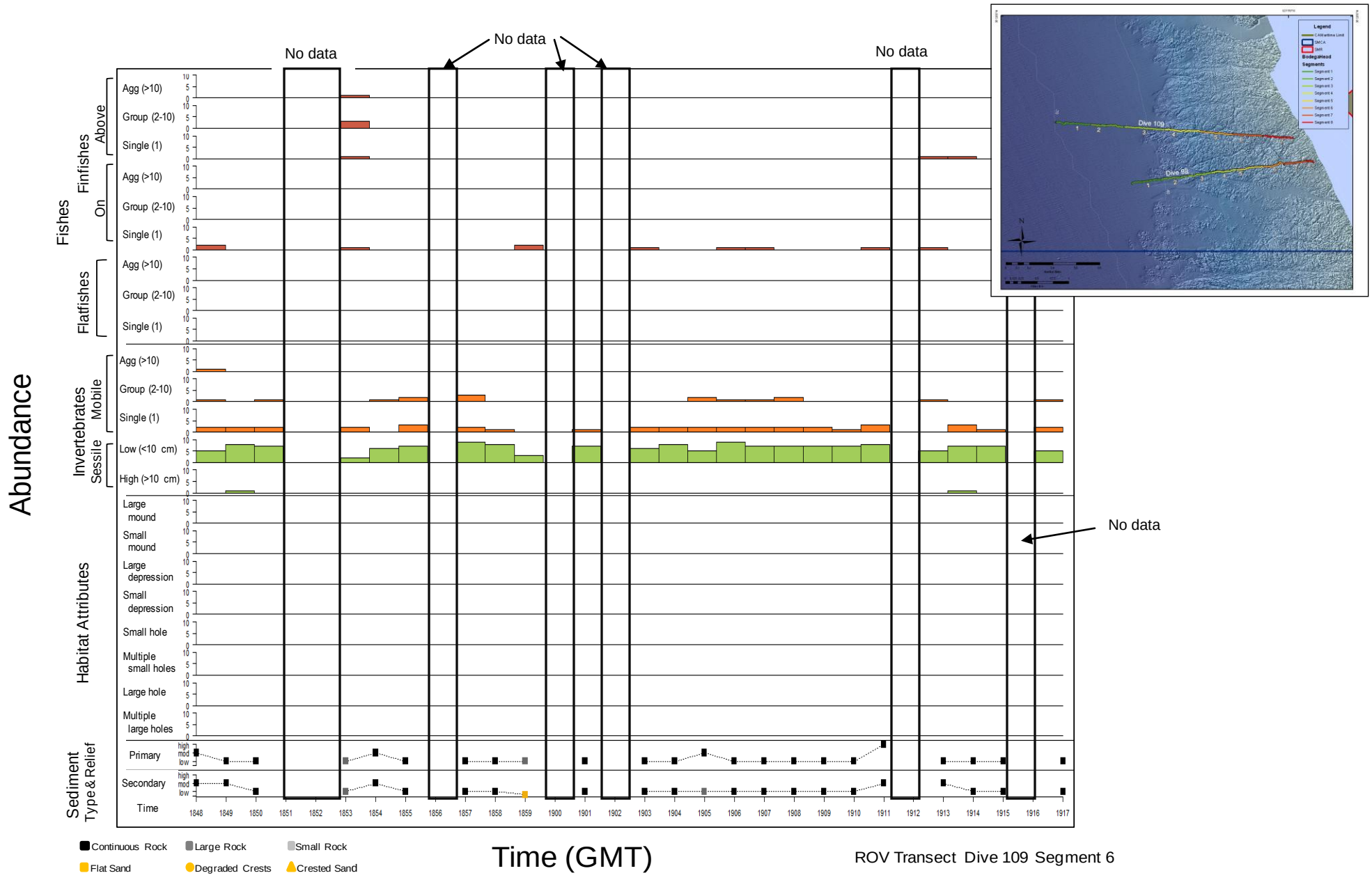

No data
No data
No data
No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment Type&Relief
Primary
Secondary
high
mod
low
Time
1848
1849
1850
1851
1852
1853
1854
1855
1856
1857
1858
1859
1900
1901
1902
1903
1904
1905
1906
1907
1908
1909
1910
1911
1912
1913
1914
1915
1916
1917
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 109 Segment 6
Dive 109
Dive 98
Legend

Figure 125

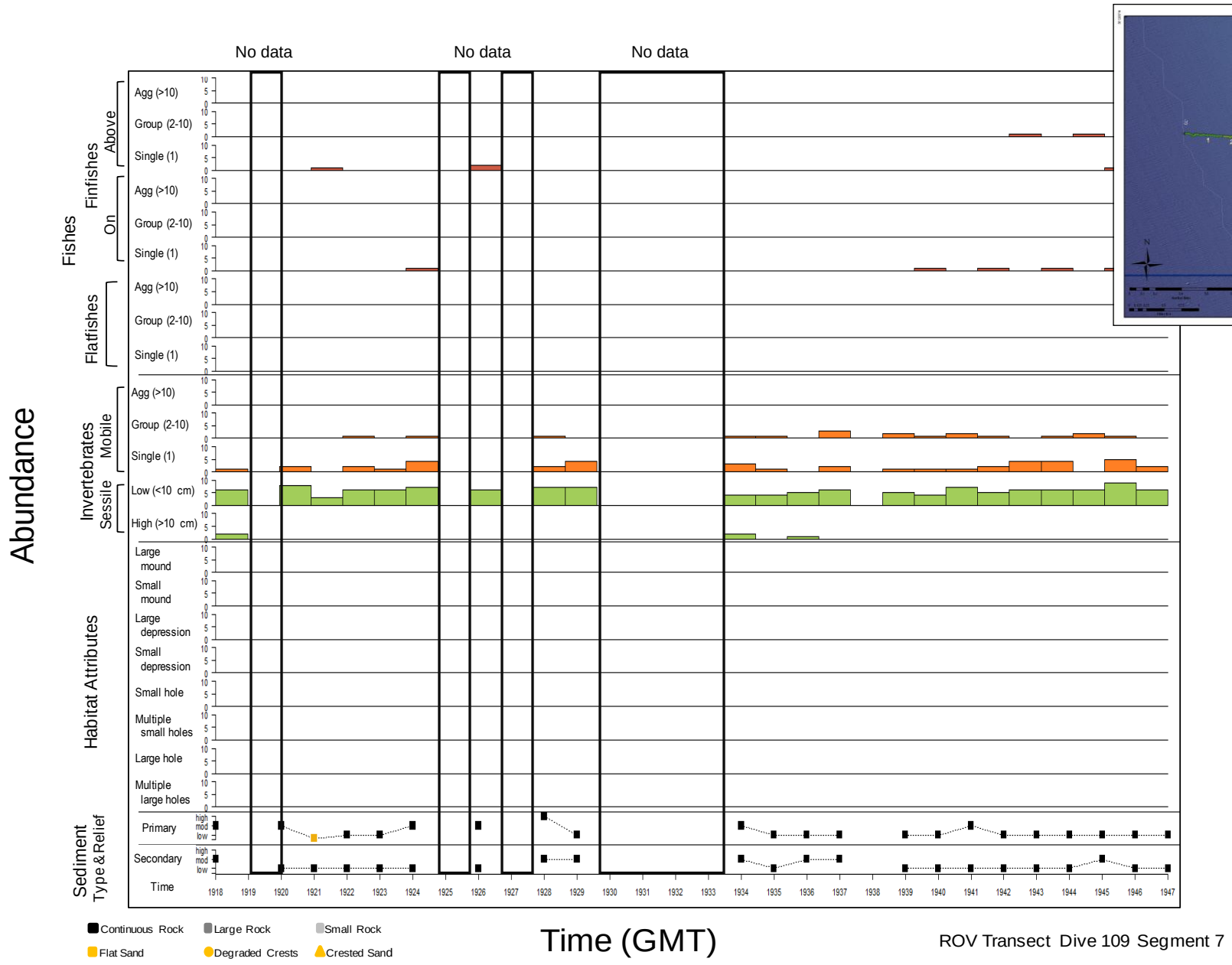

No data
No data
No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1918
1919
1920
1921
1922
1923
1924
1925
1926
1927
1928
1929
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939
1940
1941
1942
1943
1944
1945
1946
1947
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
Legend
Dive 109
Dive 98
ROV Transect Dive 109 Segment 7

Figure 126

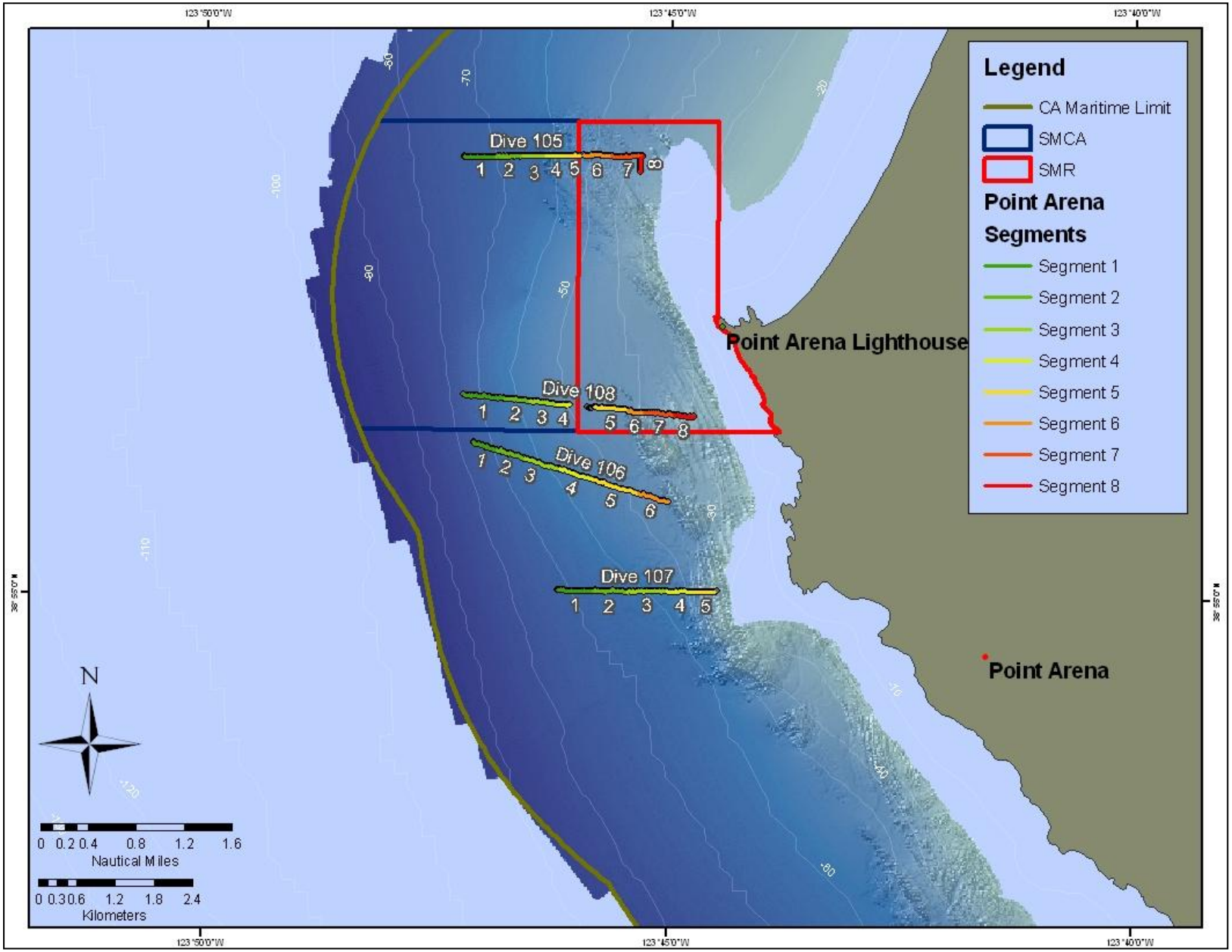


Figure 127: Pt. Arena operating area.

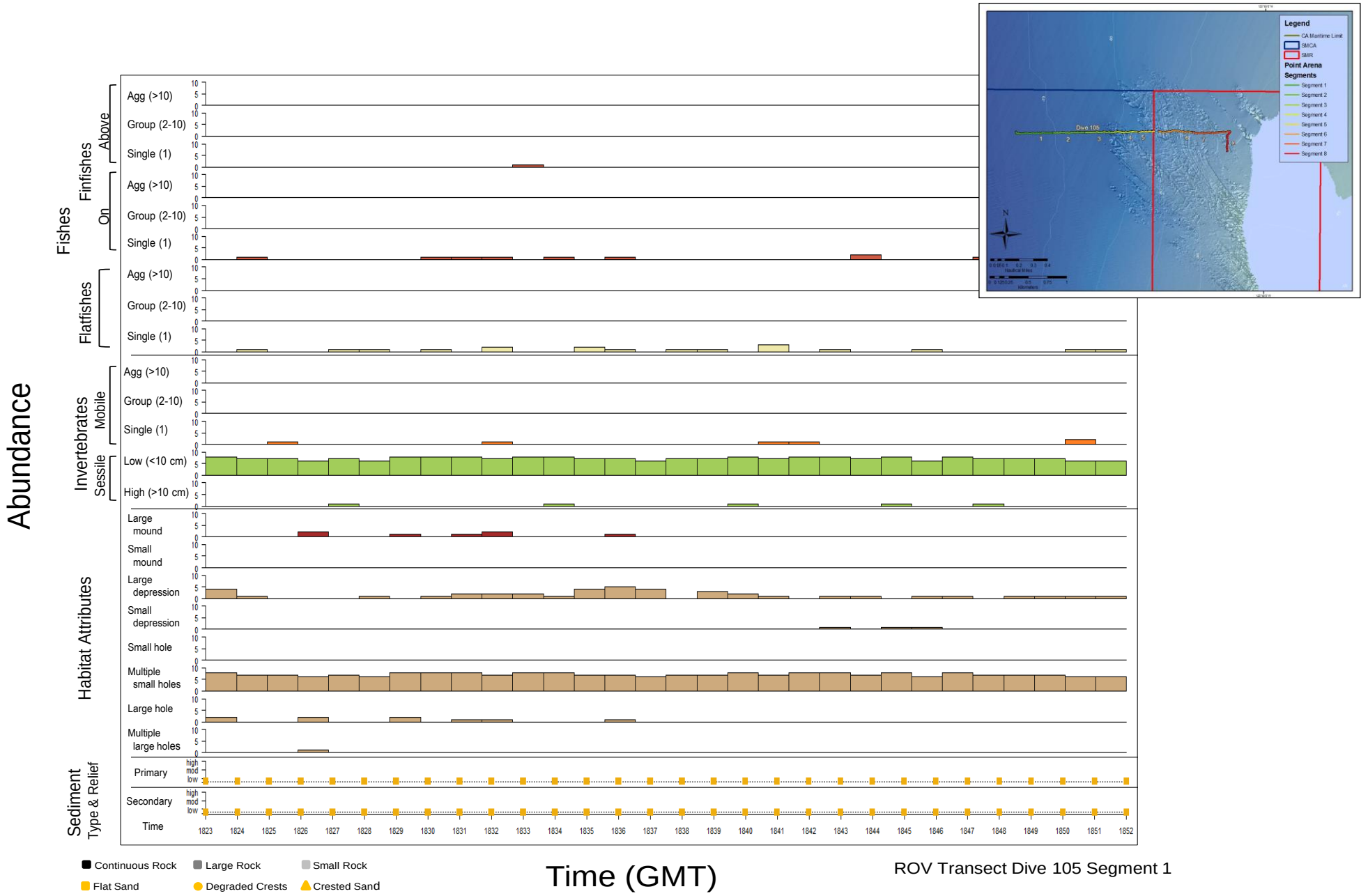

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1843 1844 1845 1846 1847 1848 1849 1850 1851 1852
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 105
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 105 Segment 1

Figure 128

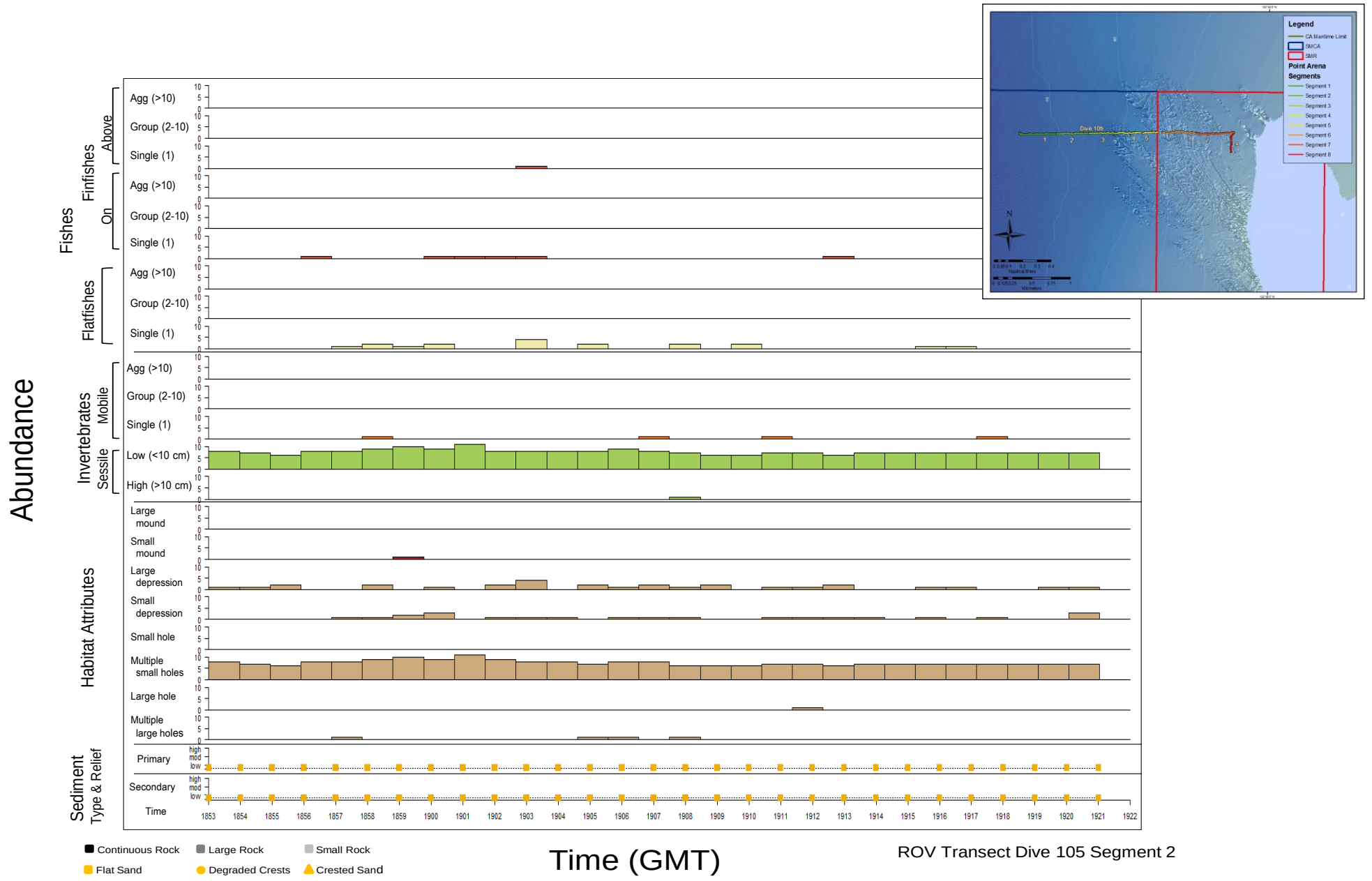

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1853
1854
1855
1856
1857
1858
1859
1900
1901
1902
1903
1904
1905
1906
1907
1908
1909
1910
1911
1912
1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 105
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 105 Segment 2

Figure 129

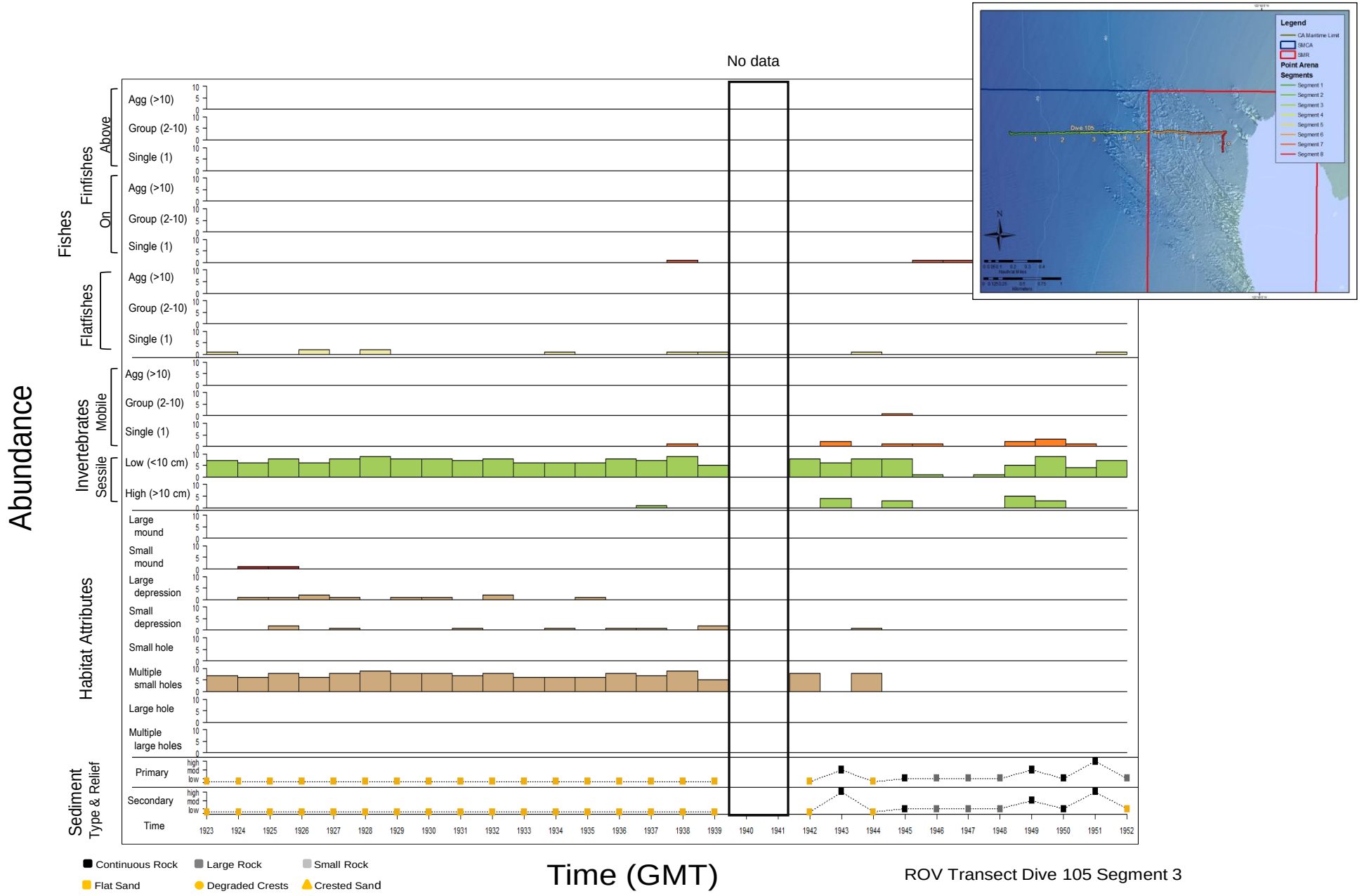

No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1923
1924
1925
1926
1927
1928
1929
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 105
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 105 Segment 3

Figure 130

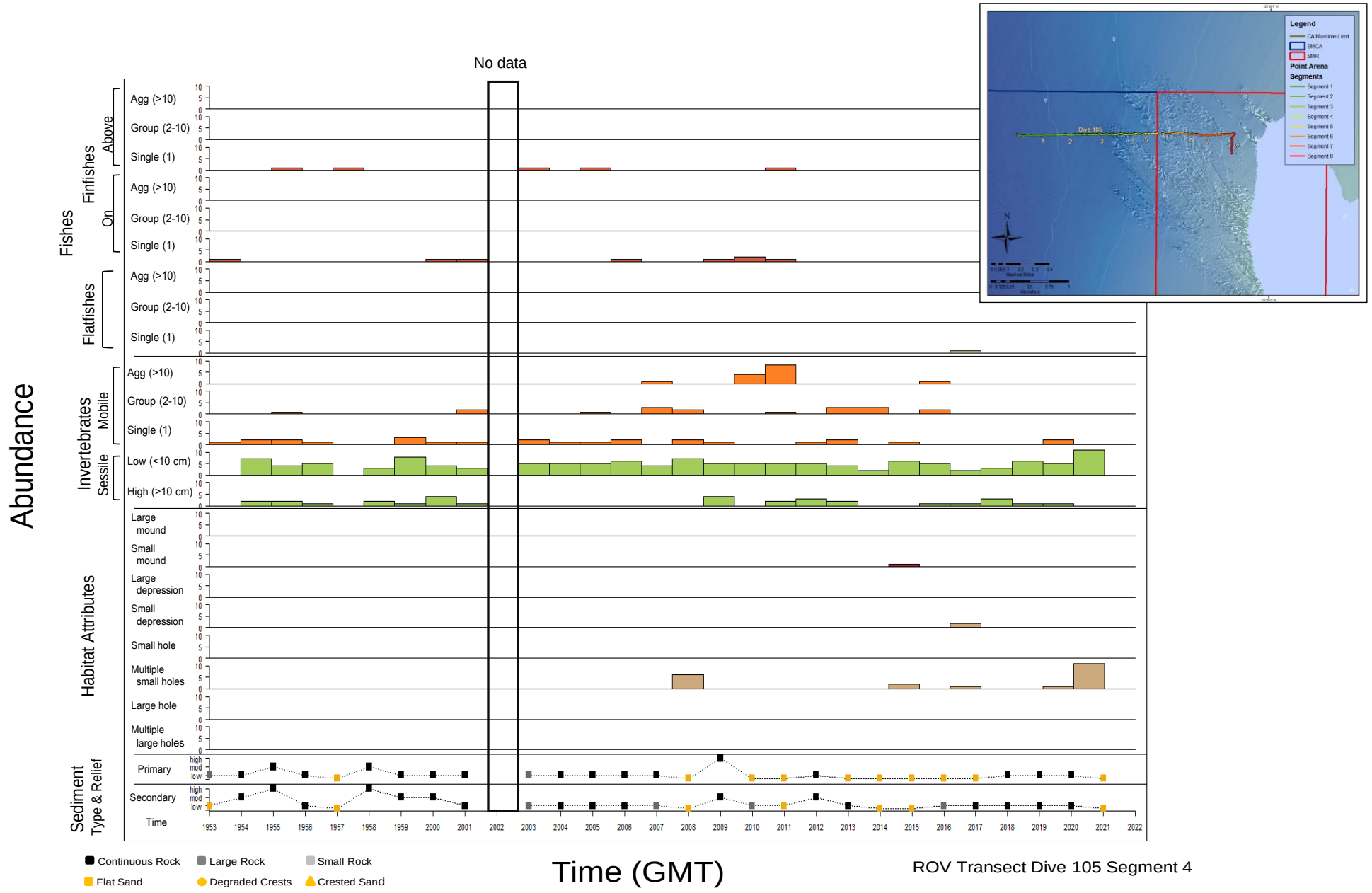

No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1953
1954
1955
1956
1957
1958
1959
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 105
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 105 Segment 4

Figure 131

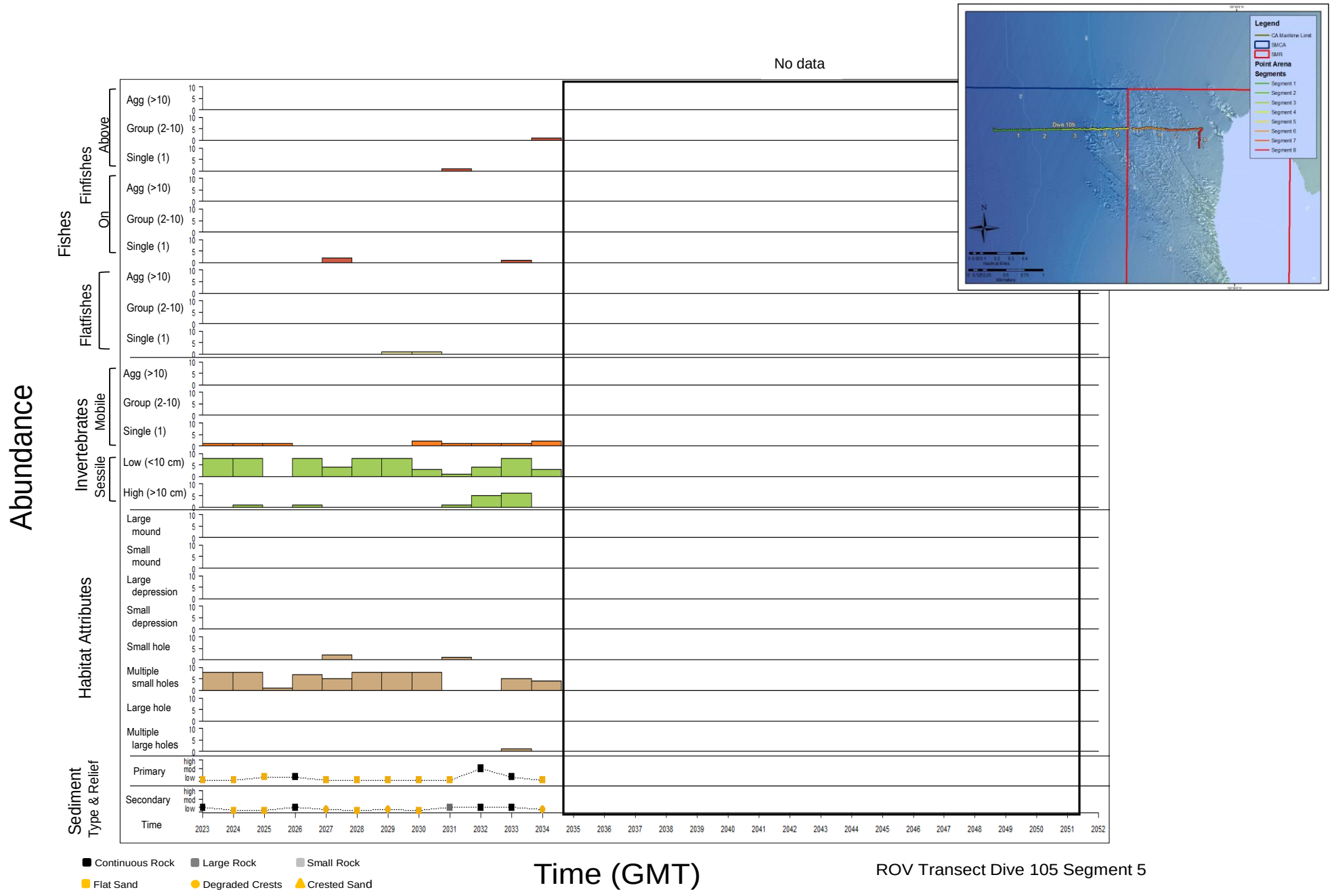

No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038
2039
2040
2041
2042
2043
2044
2045
2046
2047
2048
2049
2050
2051
2052
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 105
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 105 Segment 5

Figure 132

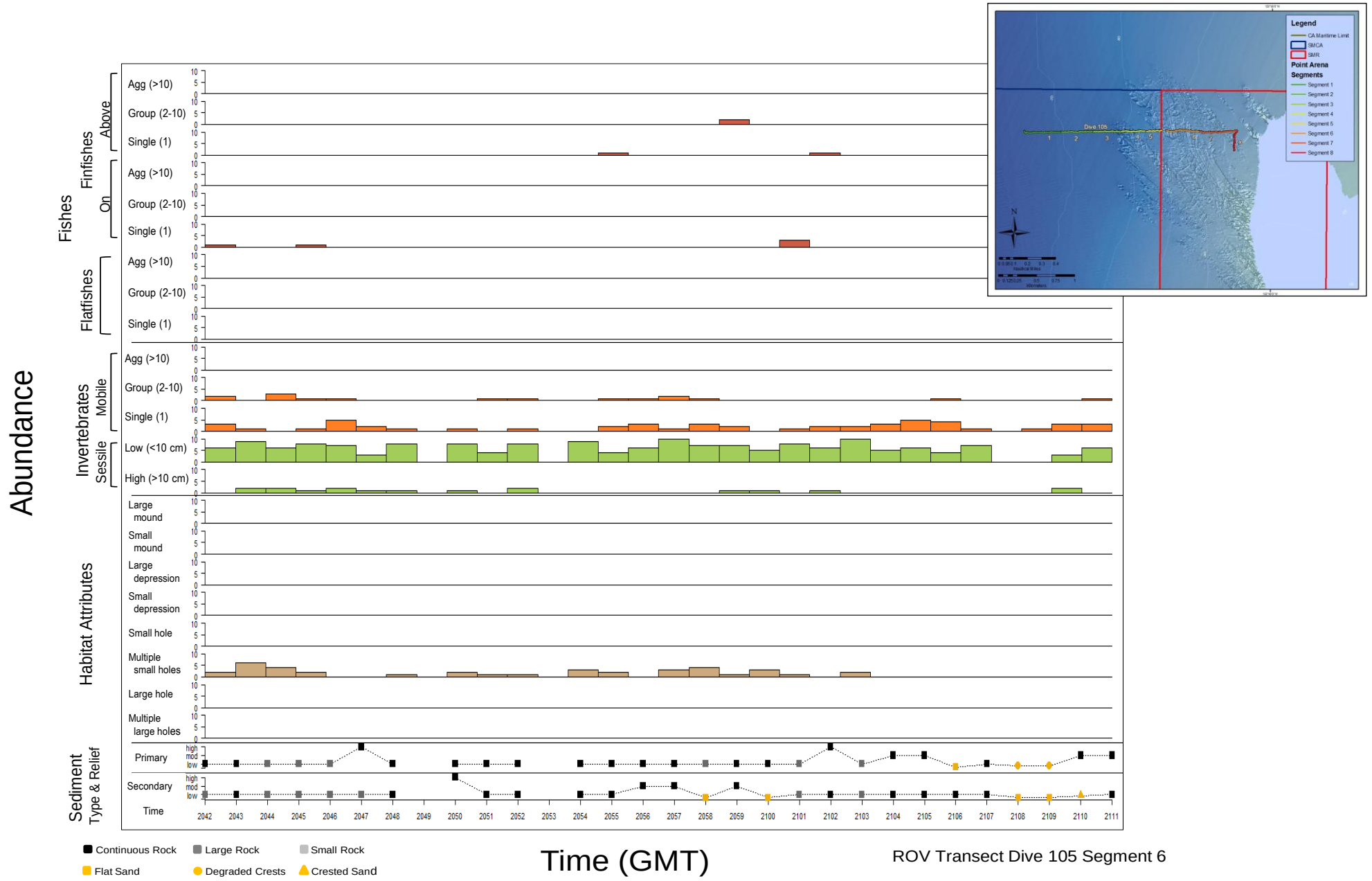

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057 2058 2059 2100 2101 2102 2103 2104 2105 2106 2107 2108 2109 2110 2111
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 105
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 105 Segment 6

Figure 133

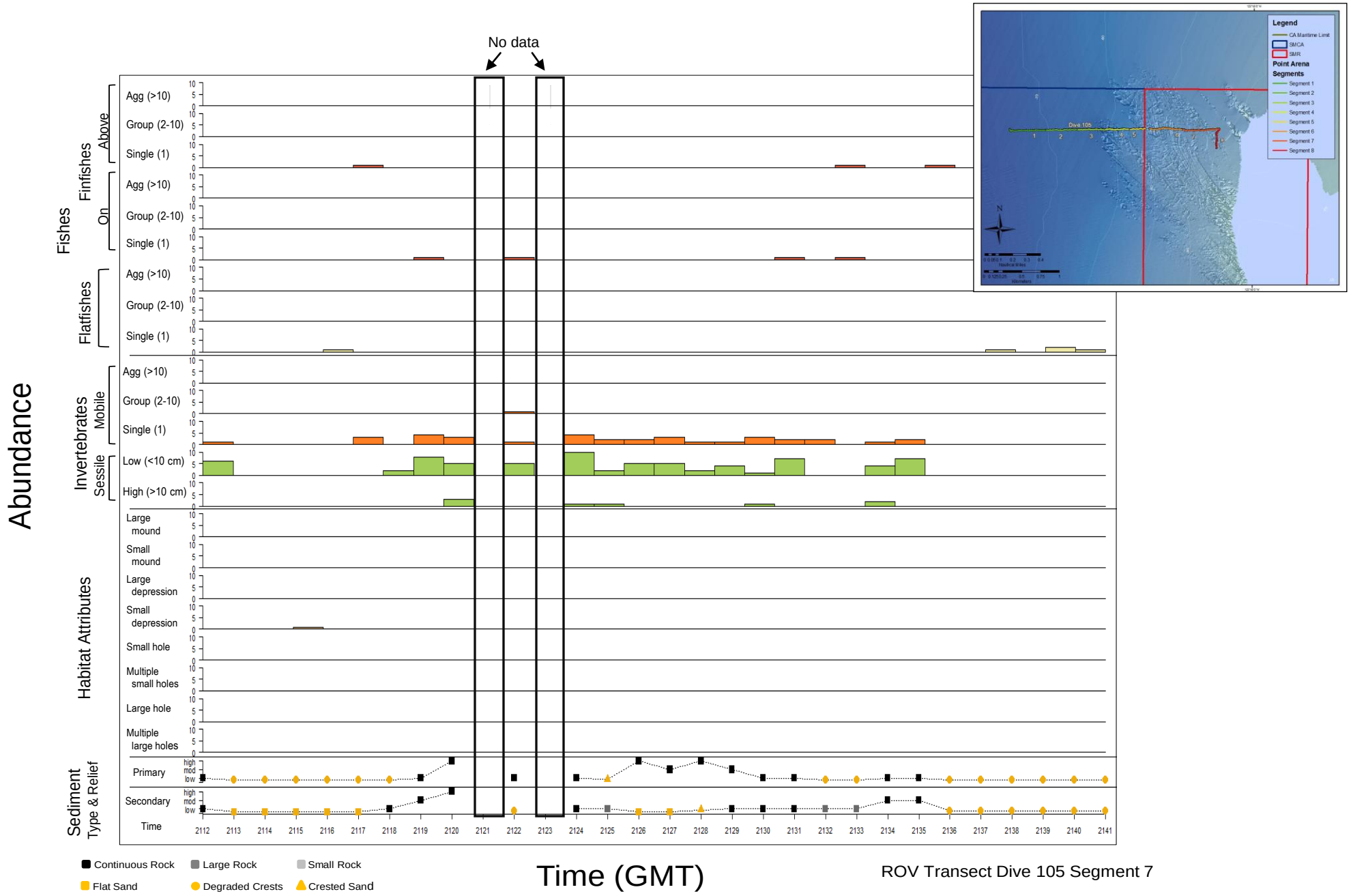

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2112
2113
2114
2115
2116
2117
2118
2119
2120
2121
2122
2123
2124
2125
2126
2127
2128
2129
2130
2131
2132
2133
2134
2135
2136
2137
2138
2139
2140
2141
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 105
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 105 Segment 7

Figure 134

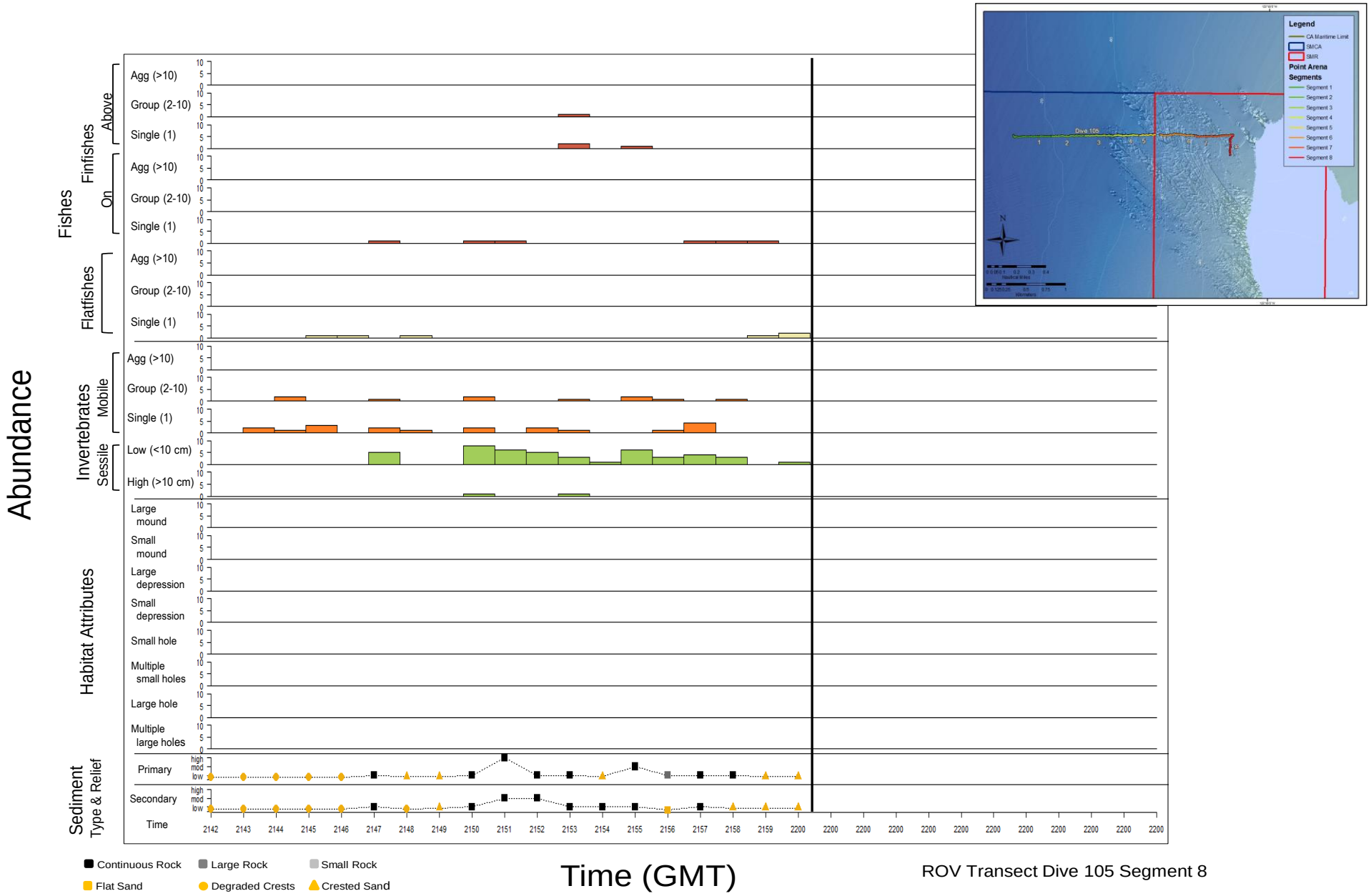

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2142
2143
2144
2145
2146
2147
2148
2149
2150
2151
2152
2153
2154
2155
2156
2157
2158
2159
2200
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 105
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 105 Segment 8

Figure 135

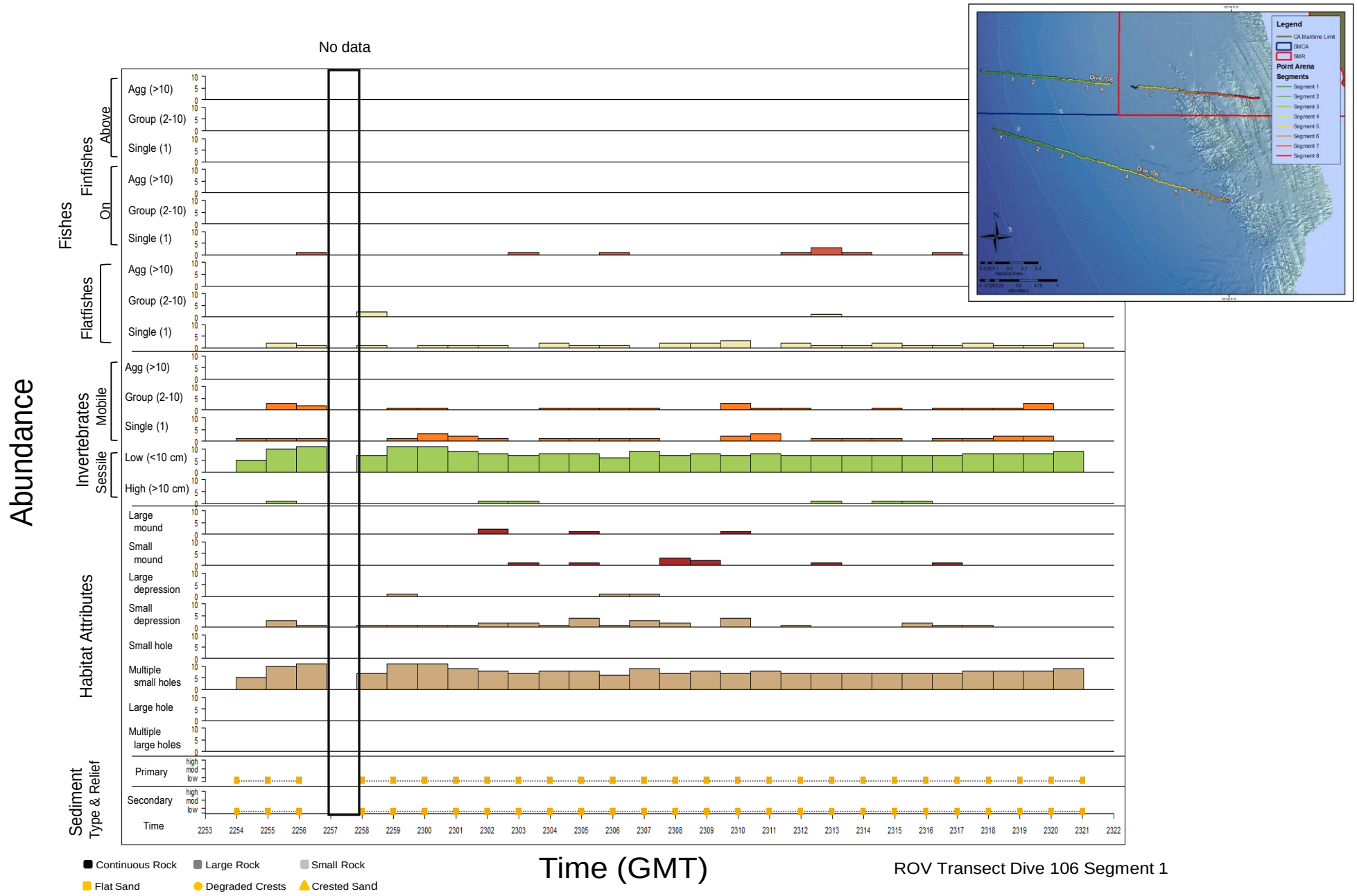

No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2253
2254
2255
2256
2257
2258
2259
2300
2301
2302
2303
2304
2305
2306
2307
2308
2309
2310
2311
2312
2313
2314
2315
2316
2317
2318
2319
2320
2321
2322
Legend
CA Maritime Limit
SMCA
SMR
Point Arena Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 108
Dive 106
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 106 Segment 1

Figure 136

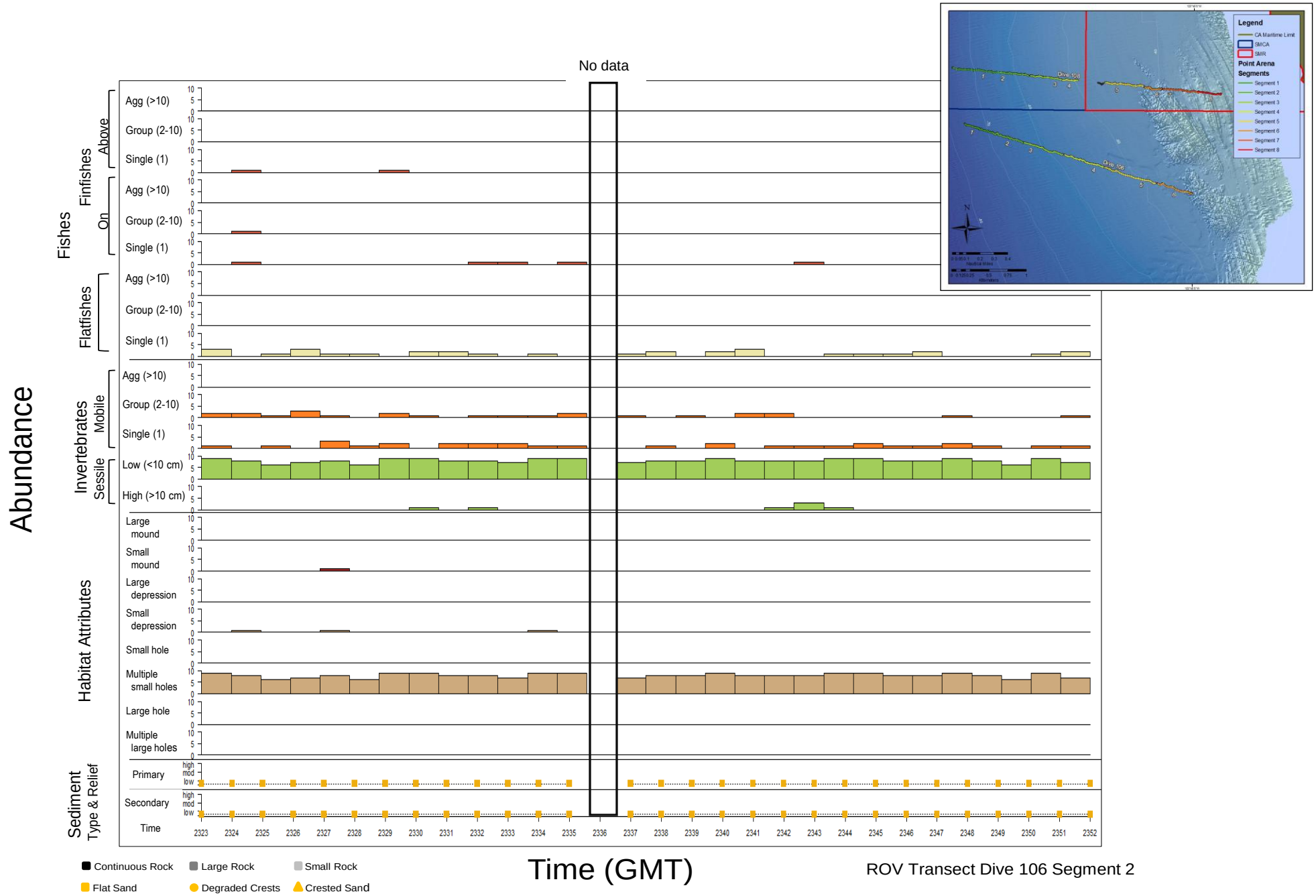

No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2323
2324
2325
2326
2327
2328
2329
2330
2331
2332
2333
2334
2335
2336
2337
2338
2339
2340
2341
2342
2343
2344
2345
2346
2347
2348
2349
2350
2351
2352
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 108
Dive 106
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 106 Segment 2

Figure 137

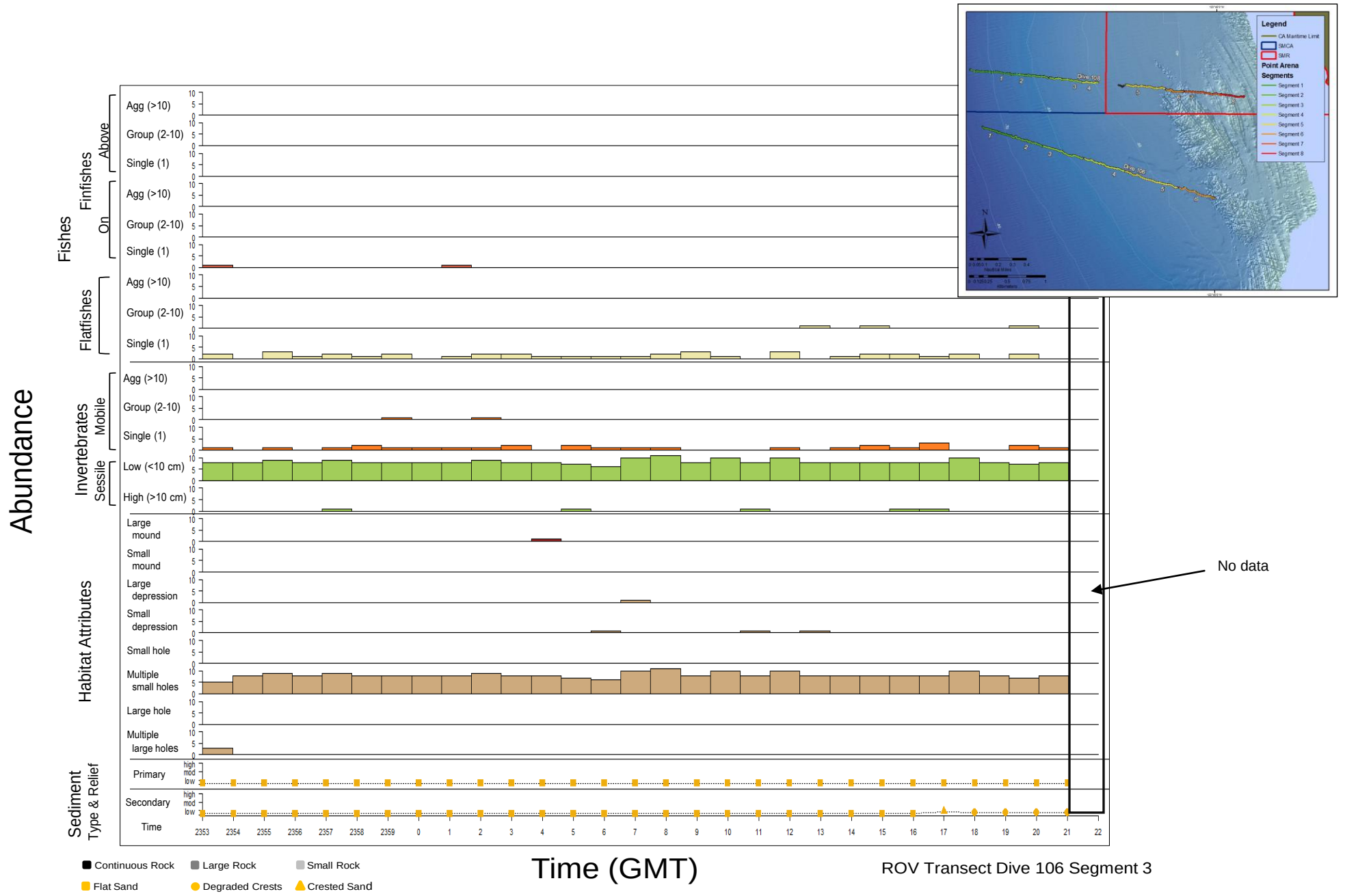

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2353
2354
2355
2356
2357
2358
2359
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 108
Dive 106
No data
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 106 Segment 3

Figure 138

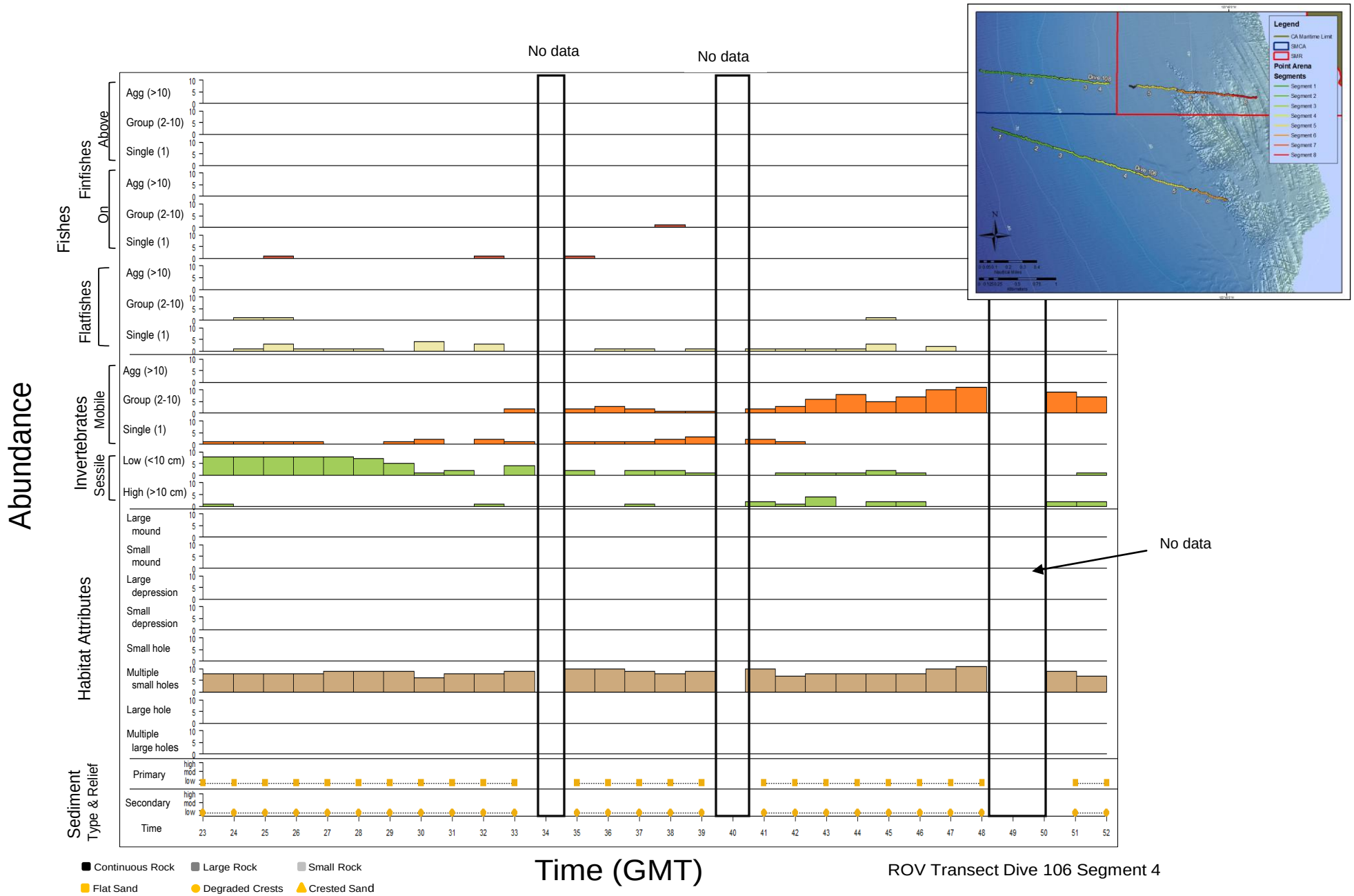

No data
No data
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
No data
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 106 Segment 4

Figure 139

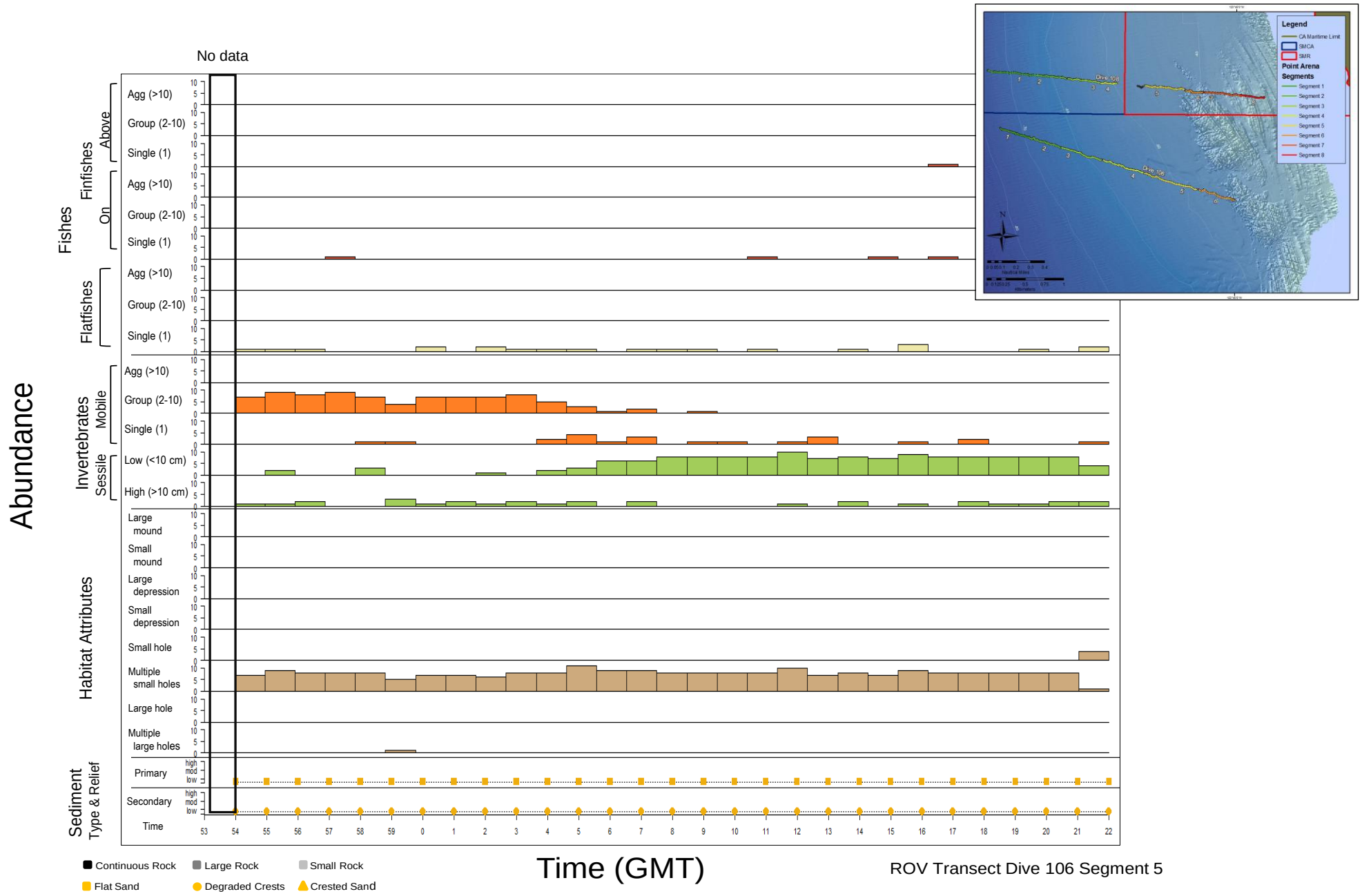

No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
53 54 55 56 57 58 59 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 106
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 106 Segment 5

Figure 140

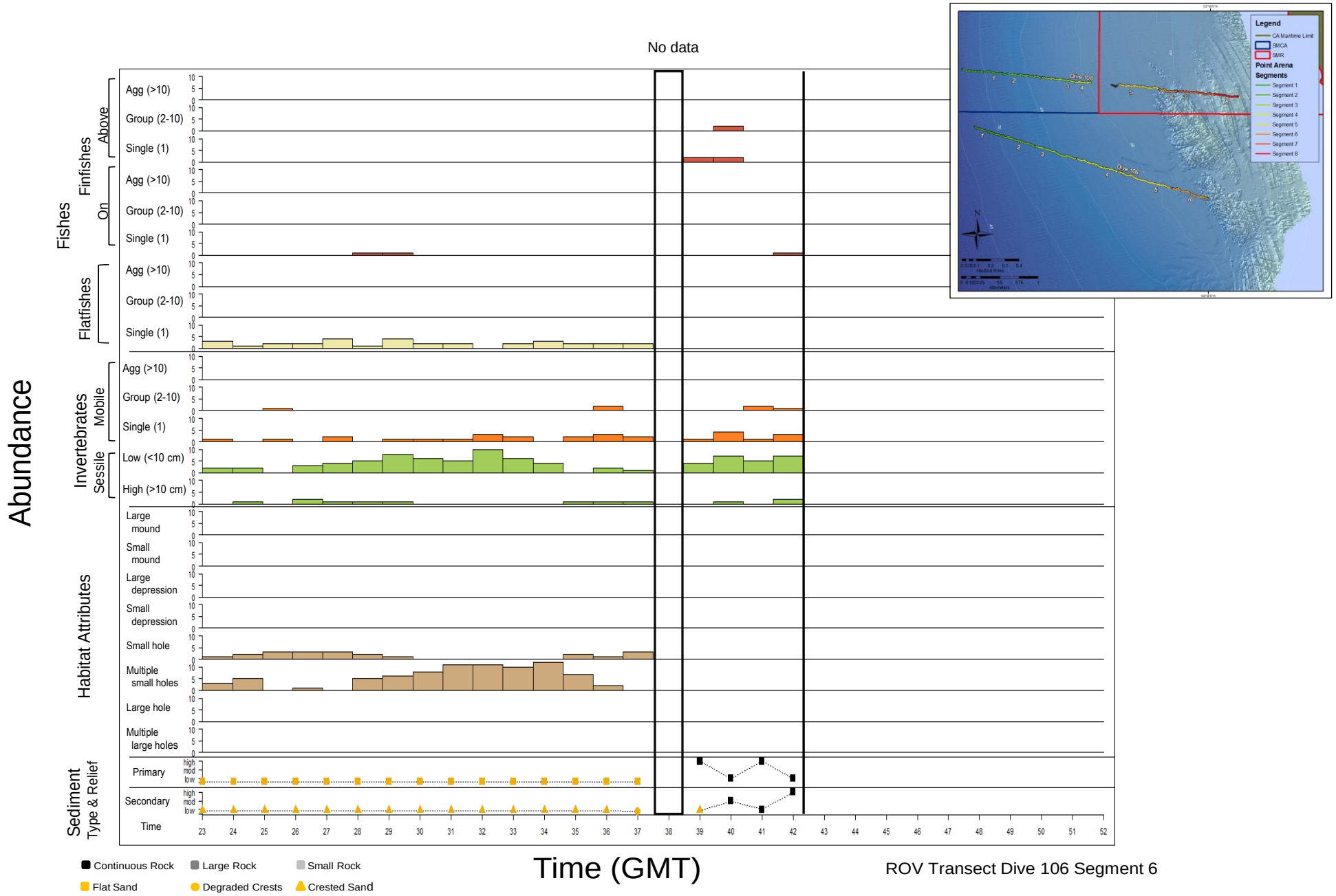

No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 106
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 106 Segment 6

Figure 141

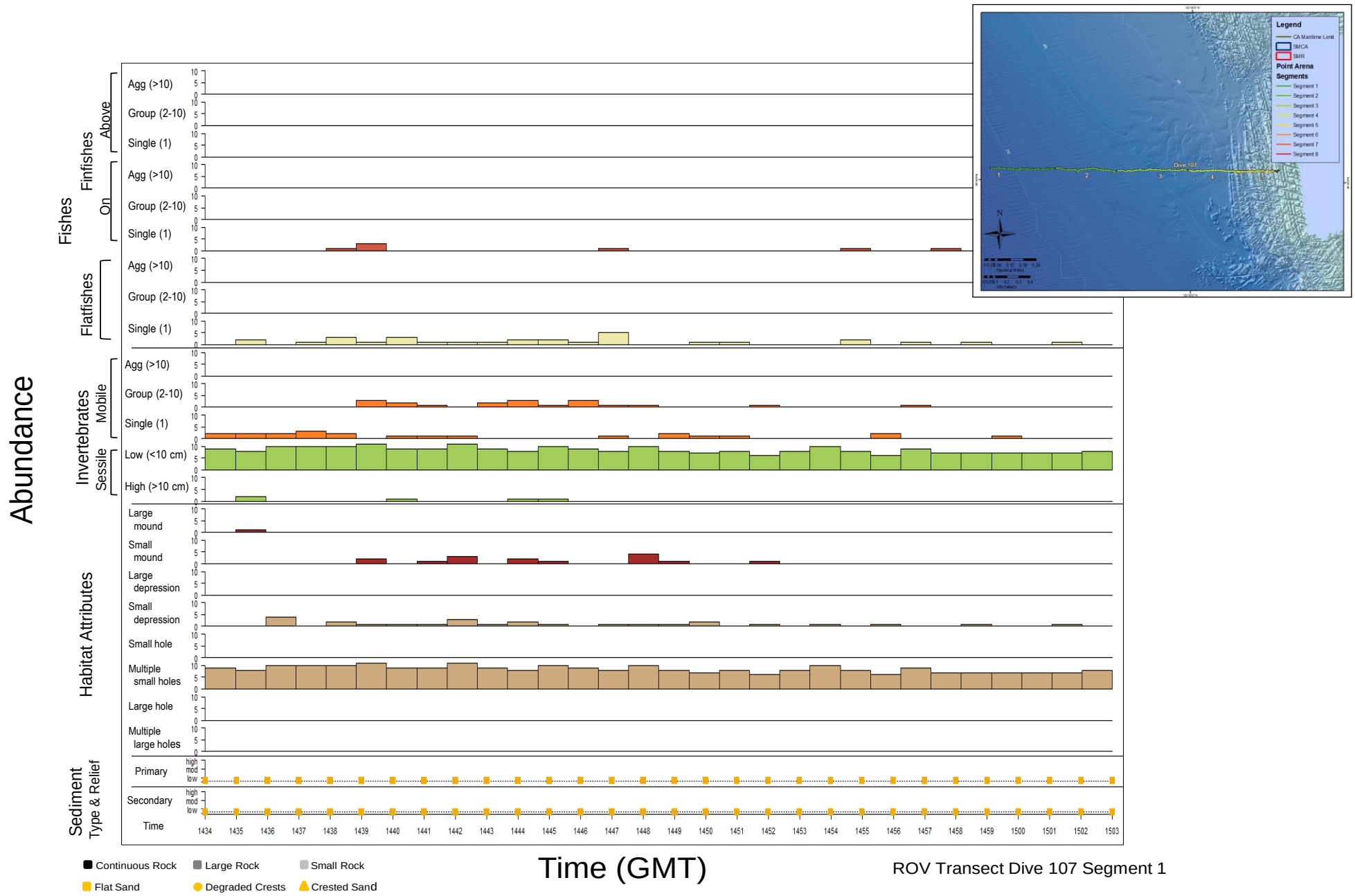

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1434 1435 1436 1437 1438 1439 1440 1441 1442 1443 1444 1445 1446 1447 1448 1449 1450 1451 1452 1453 1454 1455 1456 1457 1458 1459 1500 1501 1502 1503
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 107
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 107 Segment 1

Figure 142

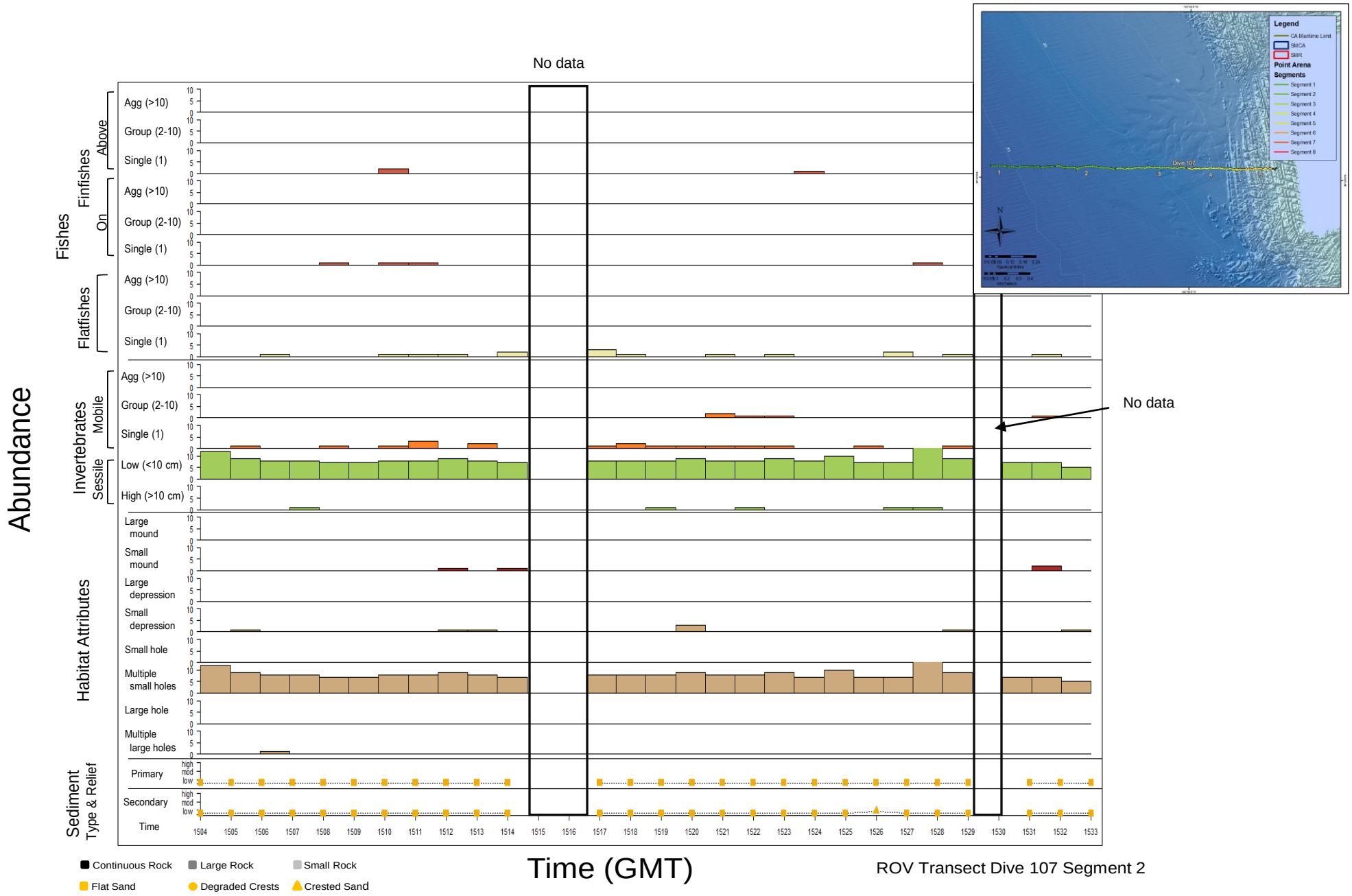

No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1504 1505 1506 1507 1508 1509 1510 1511 1512 1513 1514 1515 1516 1517 1518 1519 1520 1521 1522 1523 1524 1525 1526 1527 1528 1529 1530 1531 1532 1533
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 107
No data
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 107 Segment 2

Figure 143

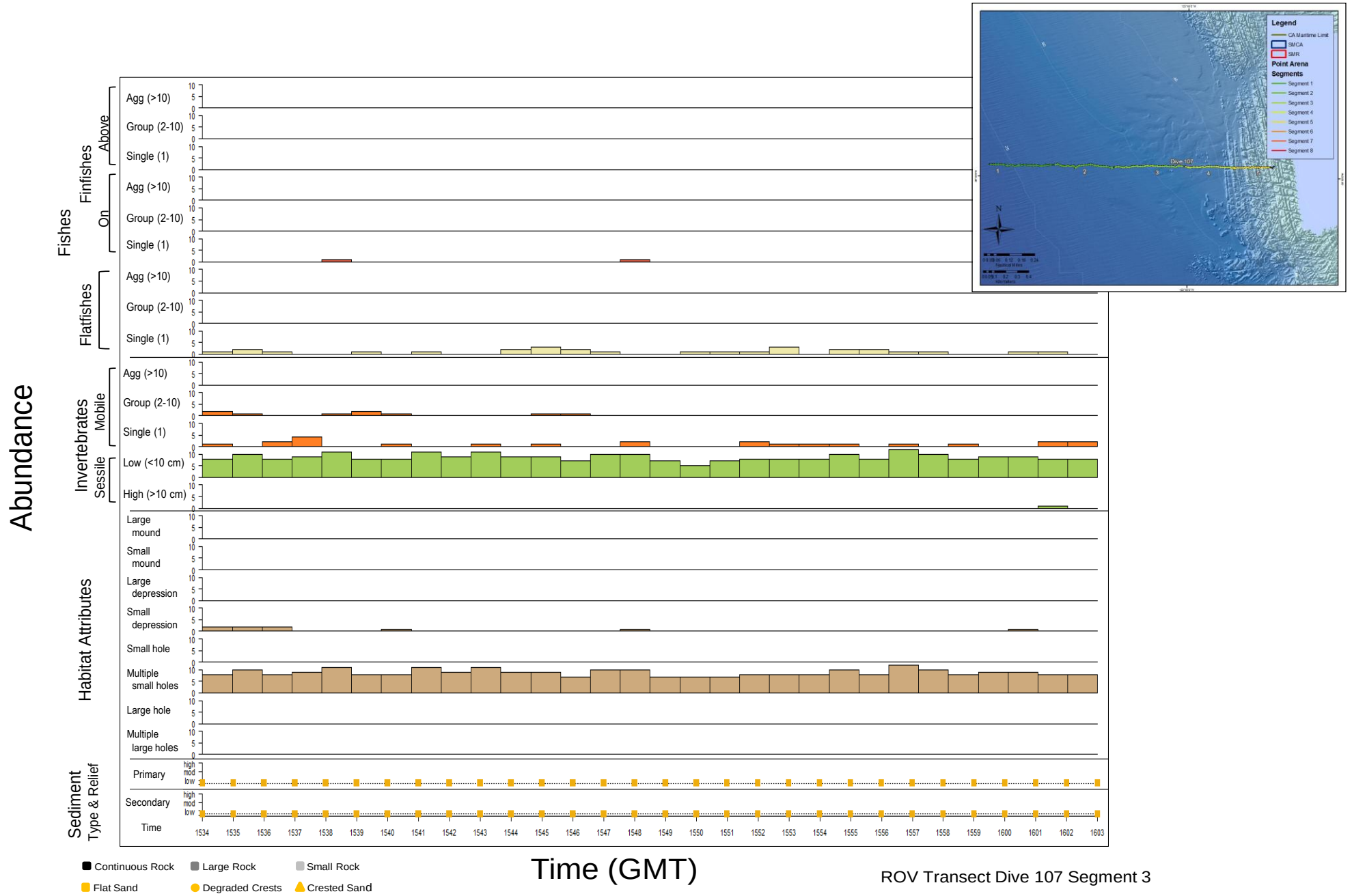

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1534 1535 1536 1537 1538 1539 1540 1541 1542 1543 1544 1545 1546 1547 1548 1549 1550 1551 1552 1553 1554 1555 1556 1557 1558 1559 1600 1601 1602 1603
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 107
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 107 Segment 3

Figure 144

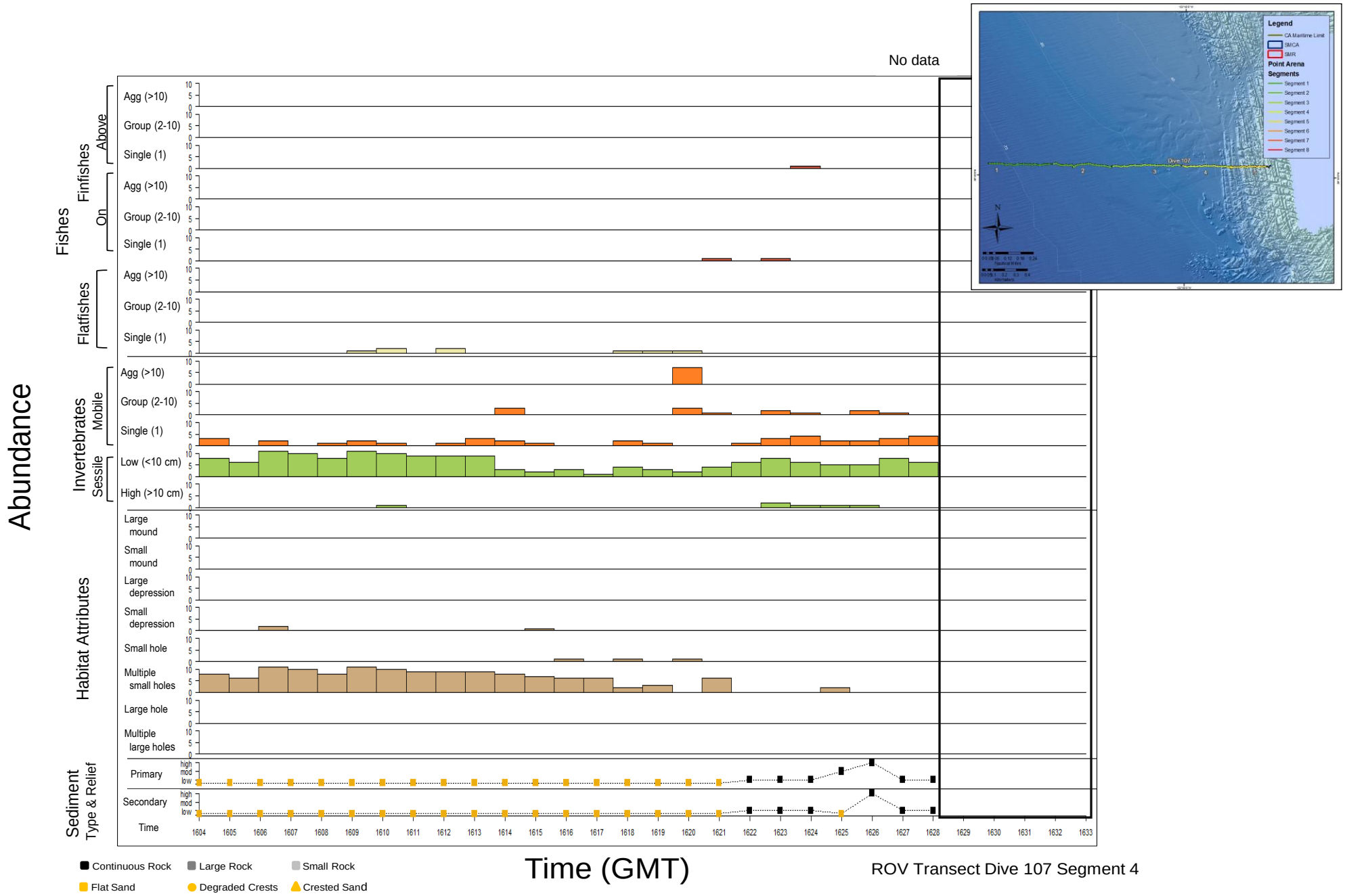

No data
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 107
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1604
1605
1606
1607
1608
1609
1610
1611
1612
1613
1614
1615
1616
1617
1618
1619
1620
1621
1622
1623
1624
1625
1626
1627
1628
1629
1630
1631
1632
1633
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 107 Segment 4

Figure 145

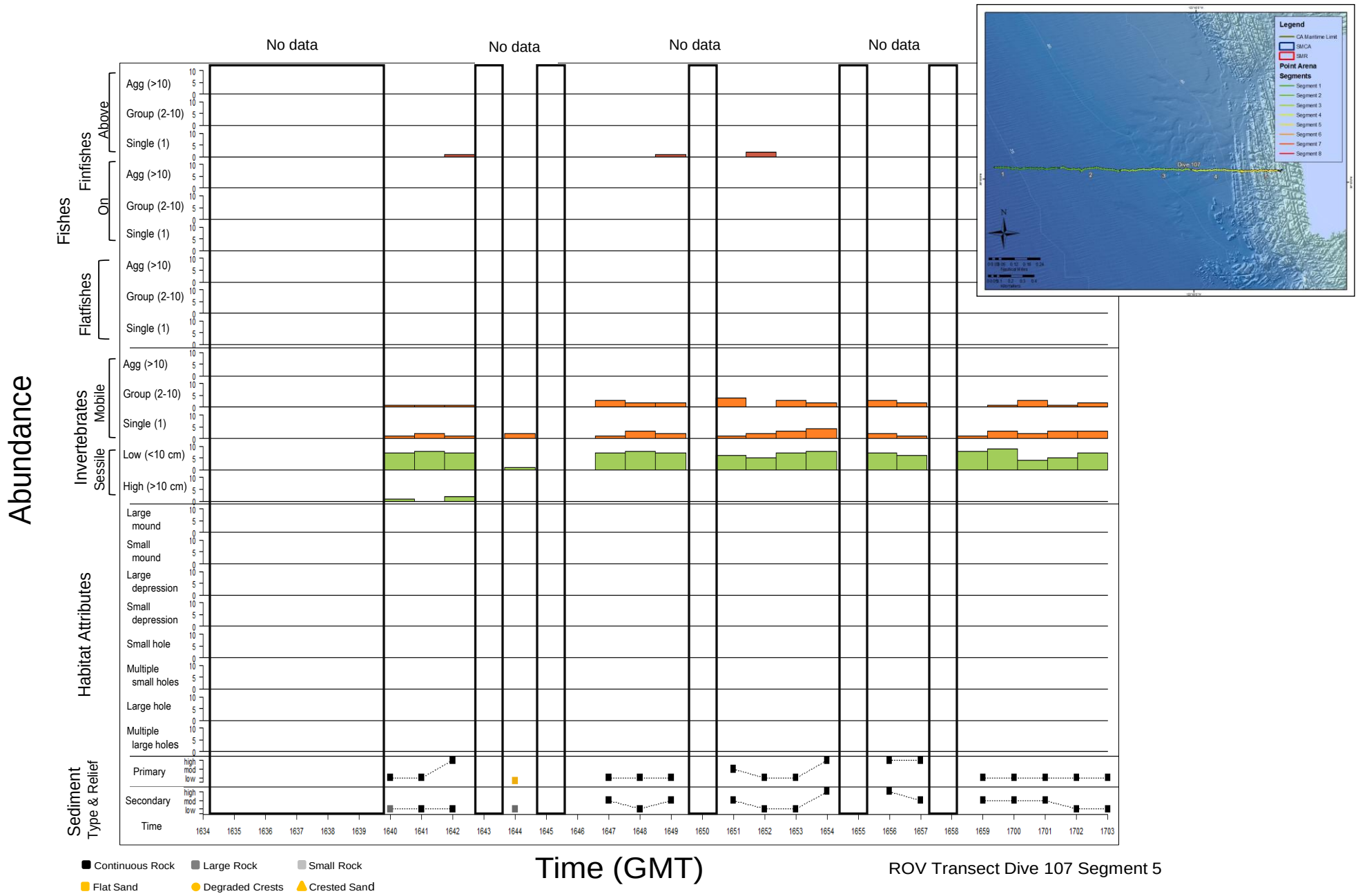

No data
No data
No data
No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1634 1635 1636 1637 1638 1639 1640 1641 1642 1643 1644 1645 1646 1647 1648 1649 1650 1651 1652 1653 1654 1655 1656 1657 1658 1659 1700 1701 1702 1703
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 107
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 107 Segment 5

Figure 146

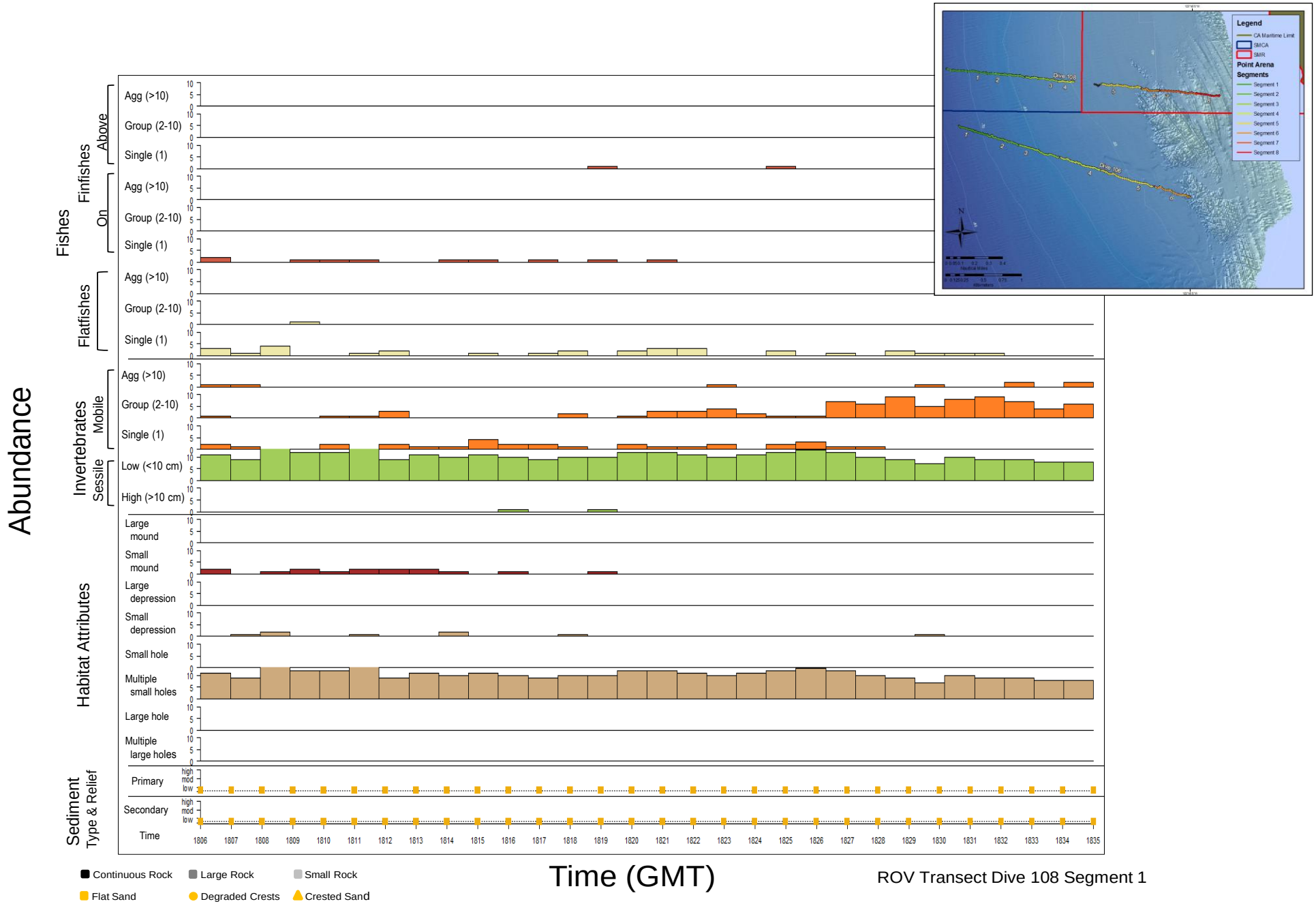

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1806 1807 1808 1809 1810 1811 1812 1813 1814 1815 1816 1817 1818 1819 1820 1821 1822 1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 108
Dive 106
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 108 Segment 1

Figure 147

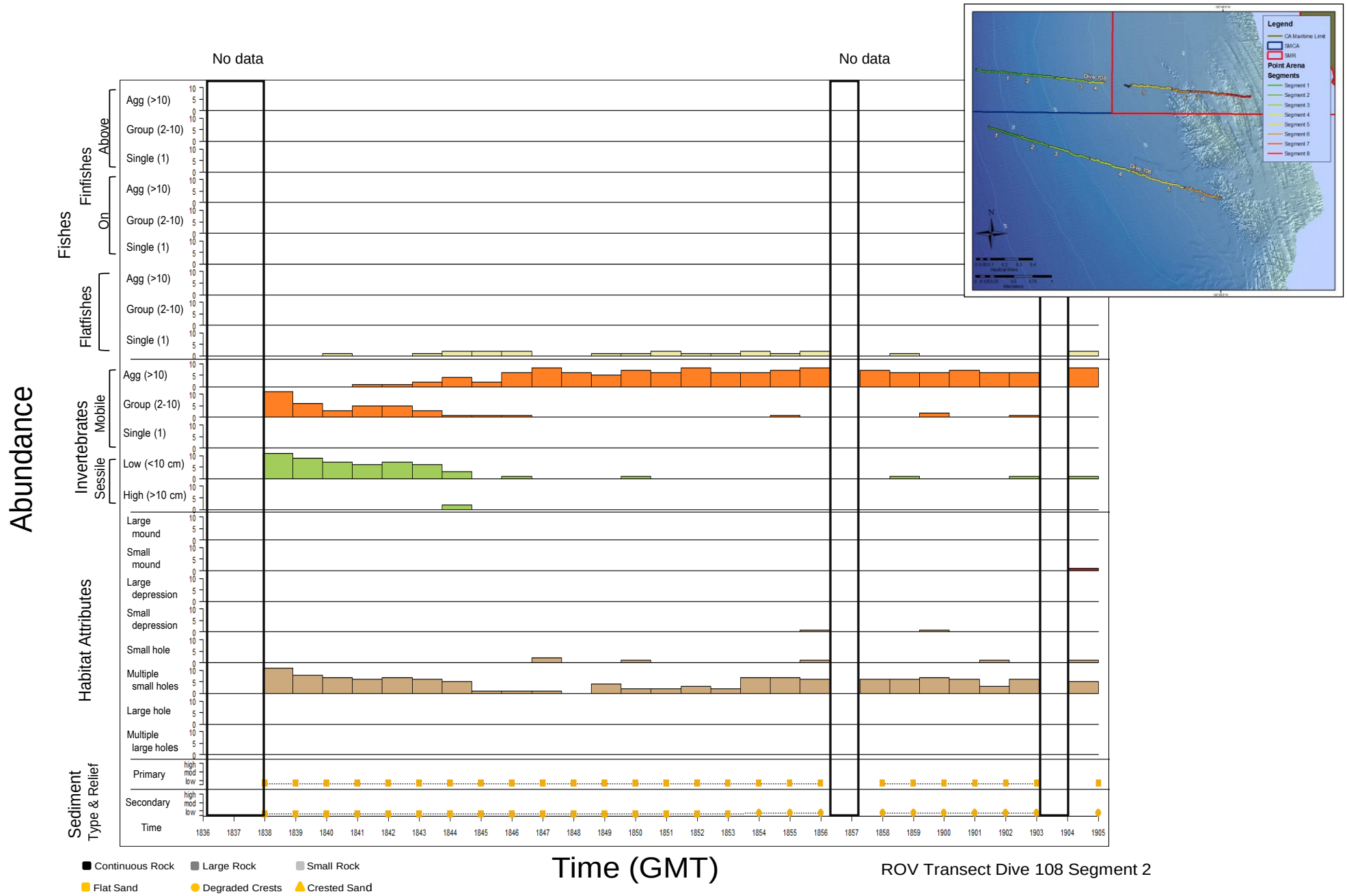

No data
No data
Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Agg (>10)
Group (2-10)
Single (1)
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1836 1837 1838 1839 1840 1841 1842 1843 1844 1845 1846 1847 1848 1849 1850 1851 1852 1853 1854 1855 1856 1857 1858 1859 1900 1901 1902 1903 1904 1905
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 108
Dive 106
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 108 Segment 2

Figure 148

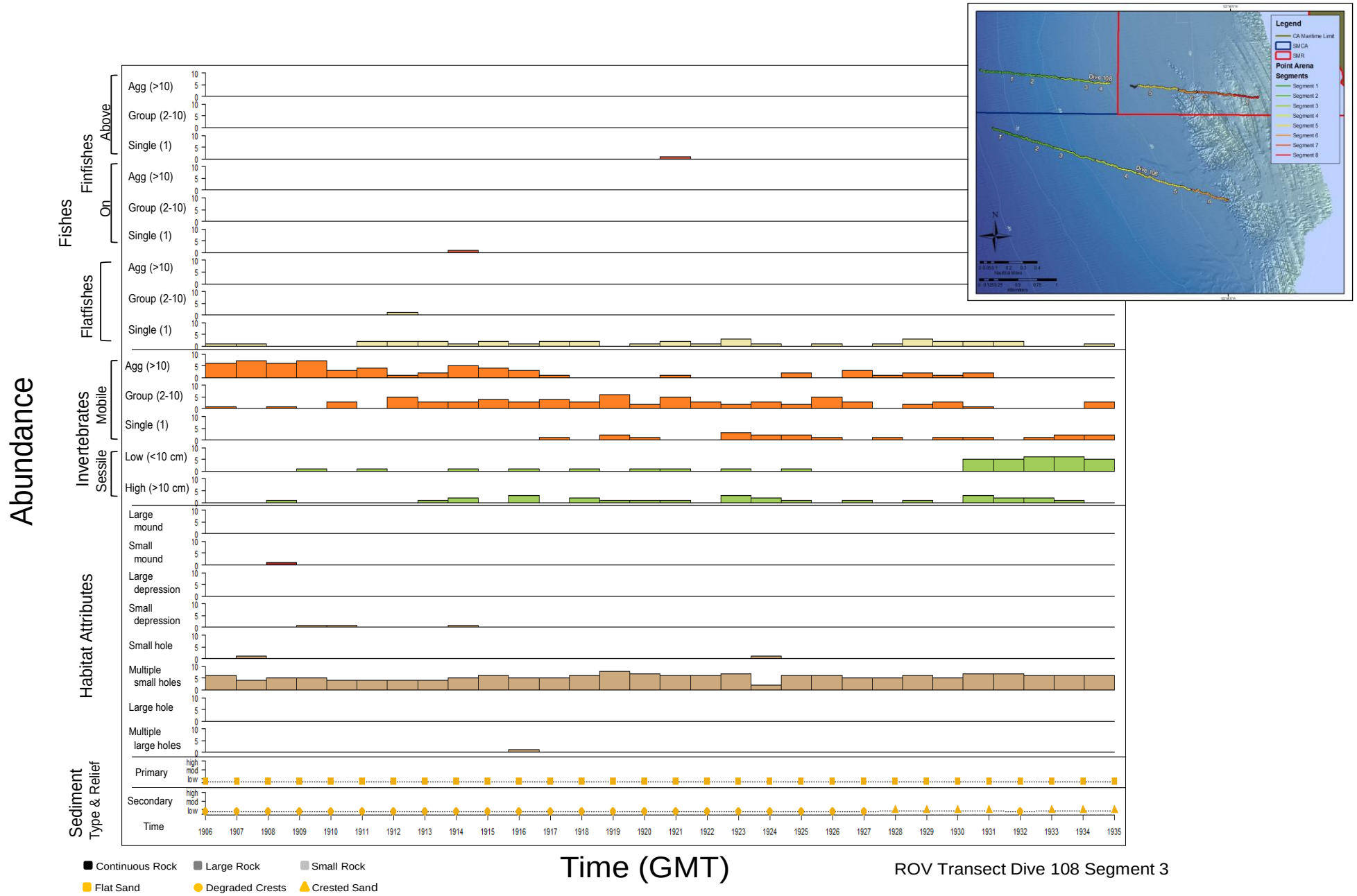

Abundance
Fishes
Finfishes
Above
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1906
1907
1908
1909
1910
1911
1912
1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
1924
1925
1926
1927
1928
1929
1930
1931
1932
1933
1934
1935
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 108
Dive 109
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 108 Segment 3

Figure 149

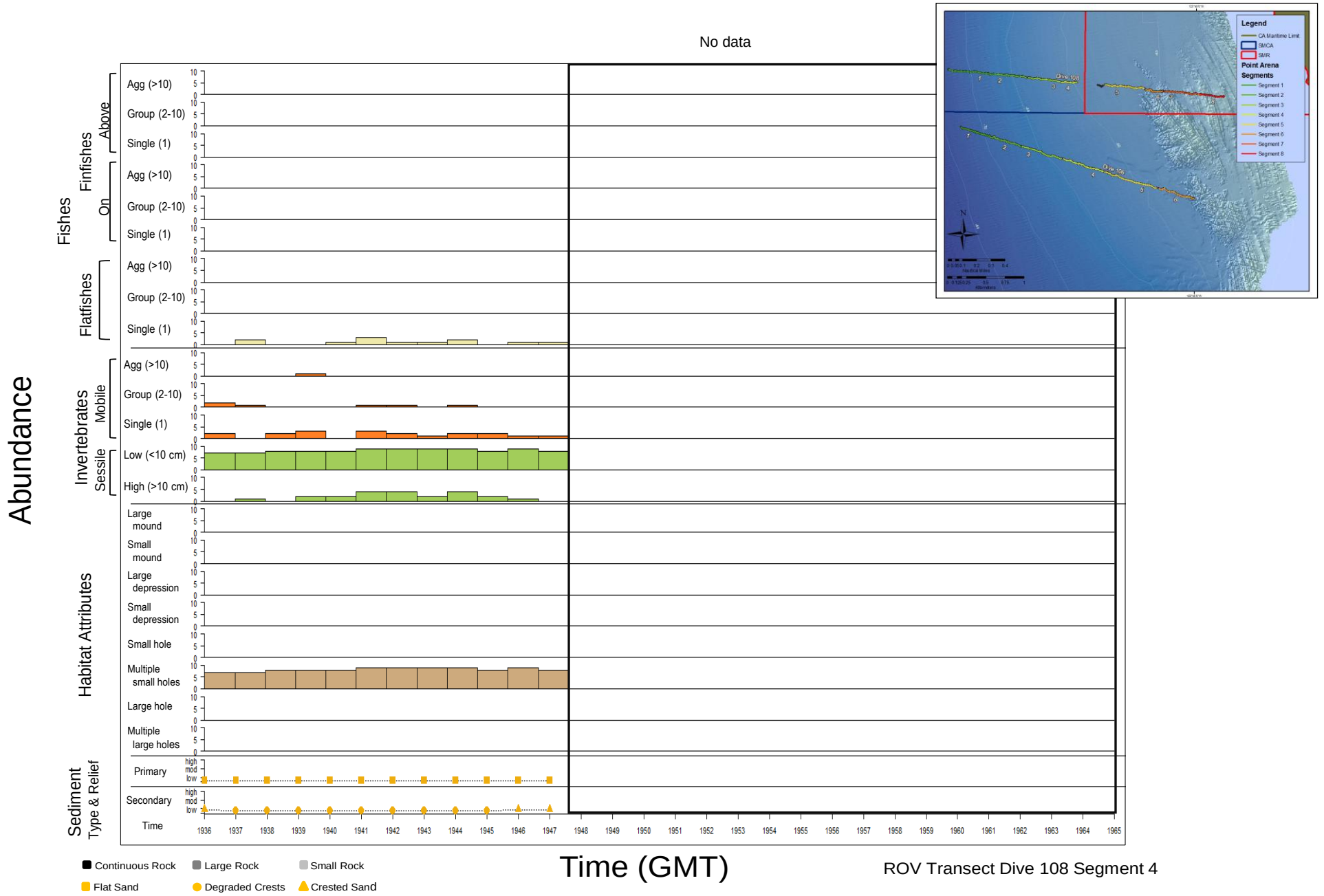

No data
Abundance
Fishes
Finfishes
Above
Agg (>10)
Group (2-10)
Single (1)
On
Agg (>10)
Group (2-10)
Single (1)
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Agg (>10)
Group (2-10)
Single (1)
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
1936 1937 1938 1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 108
Dive 108
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 108 Segment 4

Figure 150

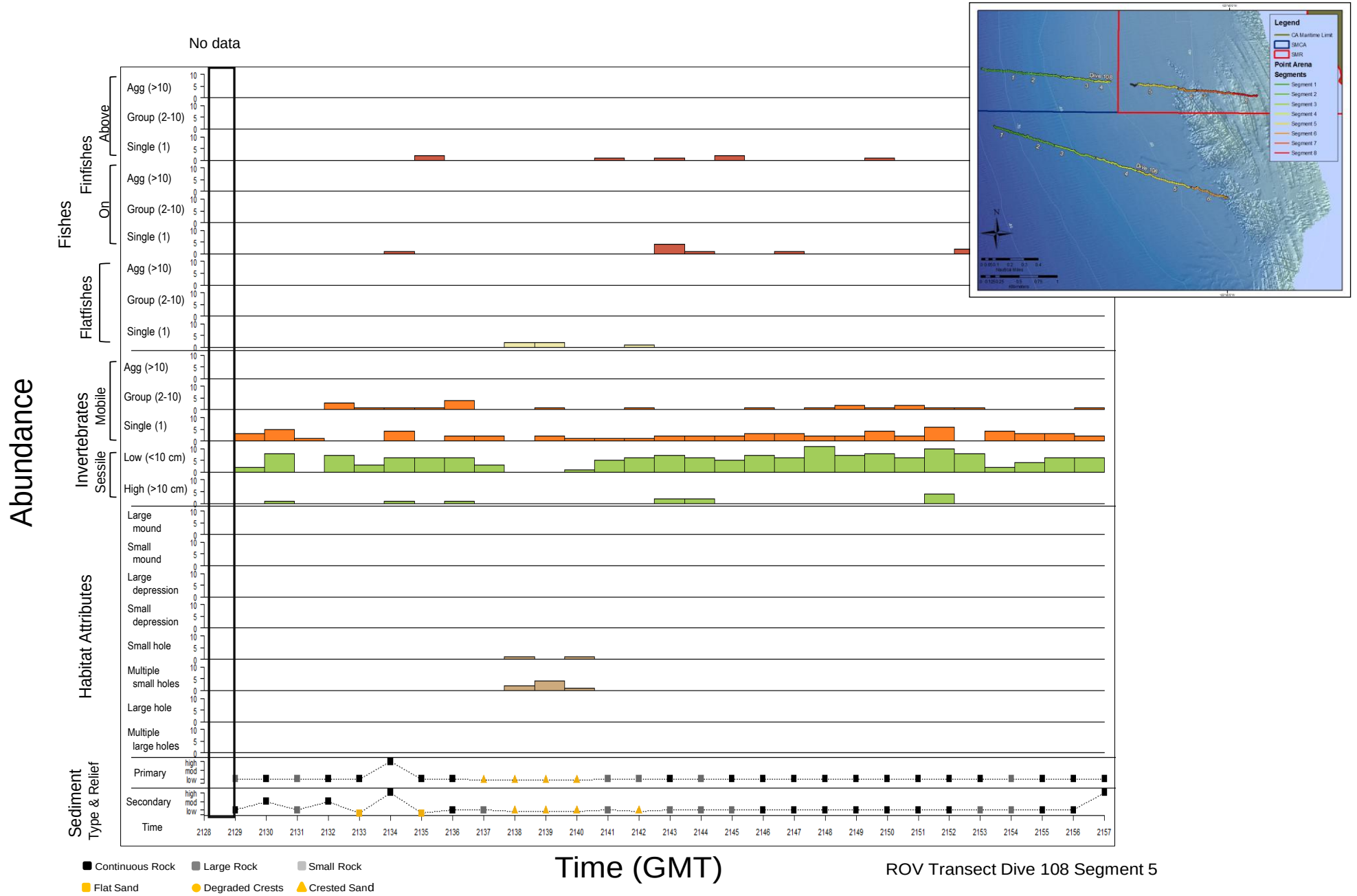

No data
Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2128
2129
2130
2131
2132
2133
2134
2135
2136
2137
2138
2139
2140
2141
2142
2143
2144
2145
2146
2147
2148
2149
2150
2151
2152
2153
2154
2155
2156
2157
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 108
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 108 Segment 5

Figure 151

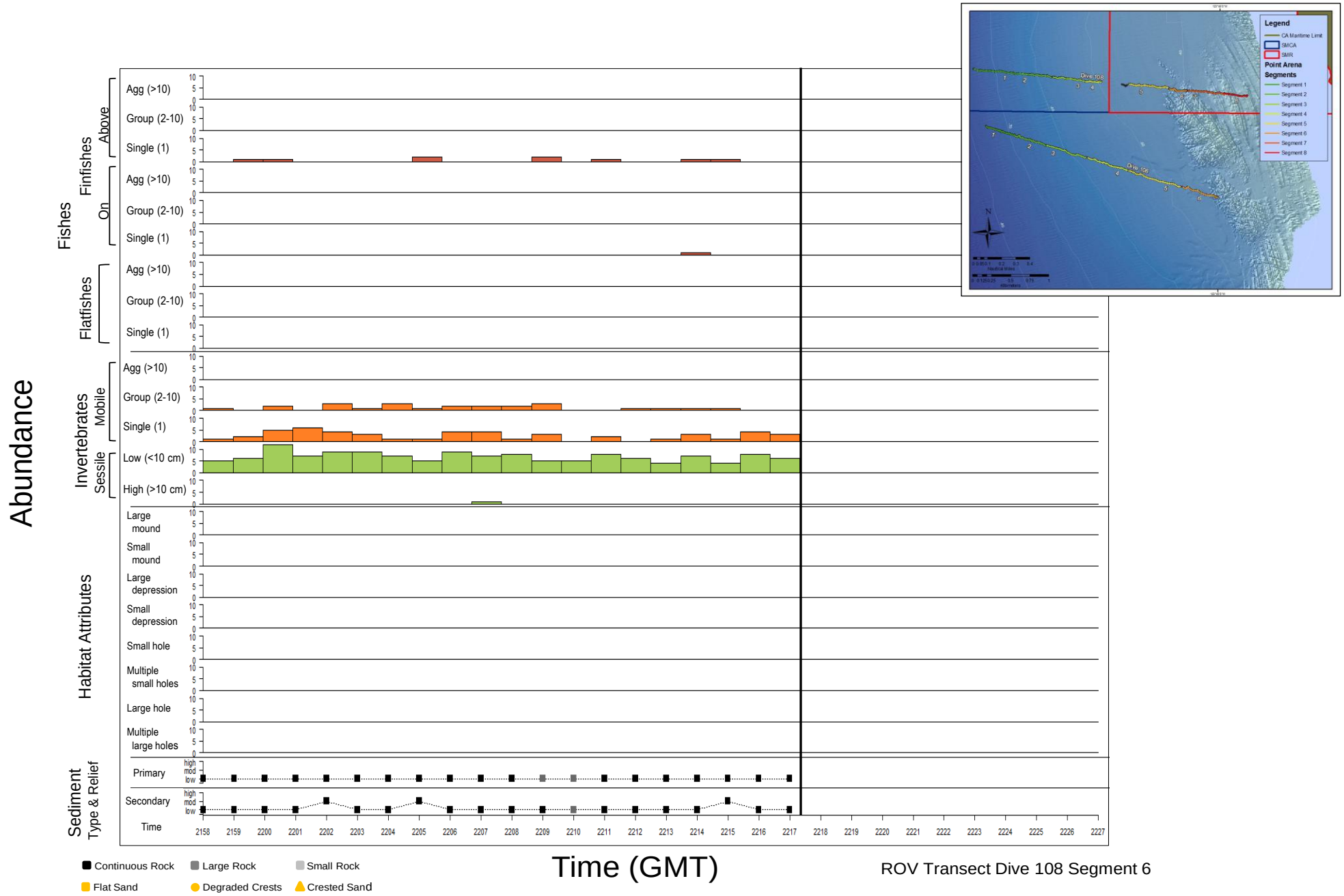

Abundance
Fishes
Finfishes
Above
On
Flatfishes
Agg (>10)
Group (2-10)
Single (1)
Invertebrates
Mobile
Sessile
Low (<10 cm)
High (>10 cm)
Habitat Attributes
Large mound
Small mound
Large depression
Small depression
Small hole
Multiple small holes
Large hole
Multiple large holes
Sediment
Type & Relief
Primary
Secondary
high
mod
low
Time
2158
2159
2200
2201
2202
2203
2204
2205
2206
2207
2208
2209
2210
2211
2212
2213
2214
2215
2216
2217
2218
2219
2220
2221
2222
2223
2224
2225
2226
2227
Legend
CA Maritime Limit
SMCA
SMR
Point Arena
Segments
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8
Dive 108
Continuous Rock
Large Rock
Small Rock
Flat Sand
Degraded Crests
Crested Sand
Time (GMT)
ROV Transect Dive 108 Segment 6

Figure 152