

Davidson Seamount Expedition “Coral Gardens”

January 26 – February 4, 2006

NOAA Ocean Explorer

Monterey Bay National Marine Sanctuary

Monterey Bay Aquarium Research Institute

EXPLORE

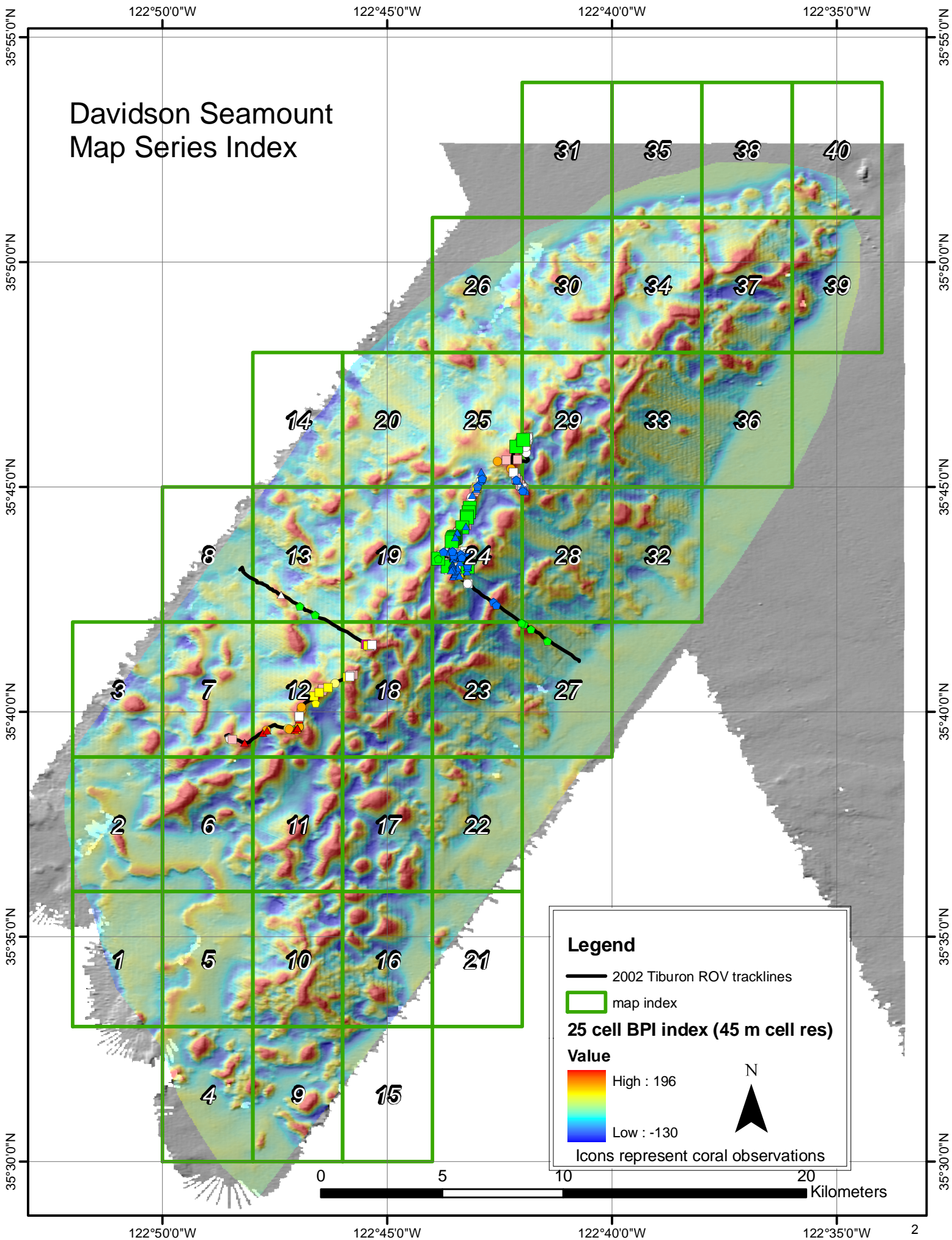


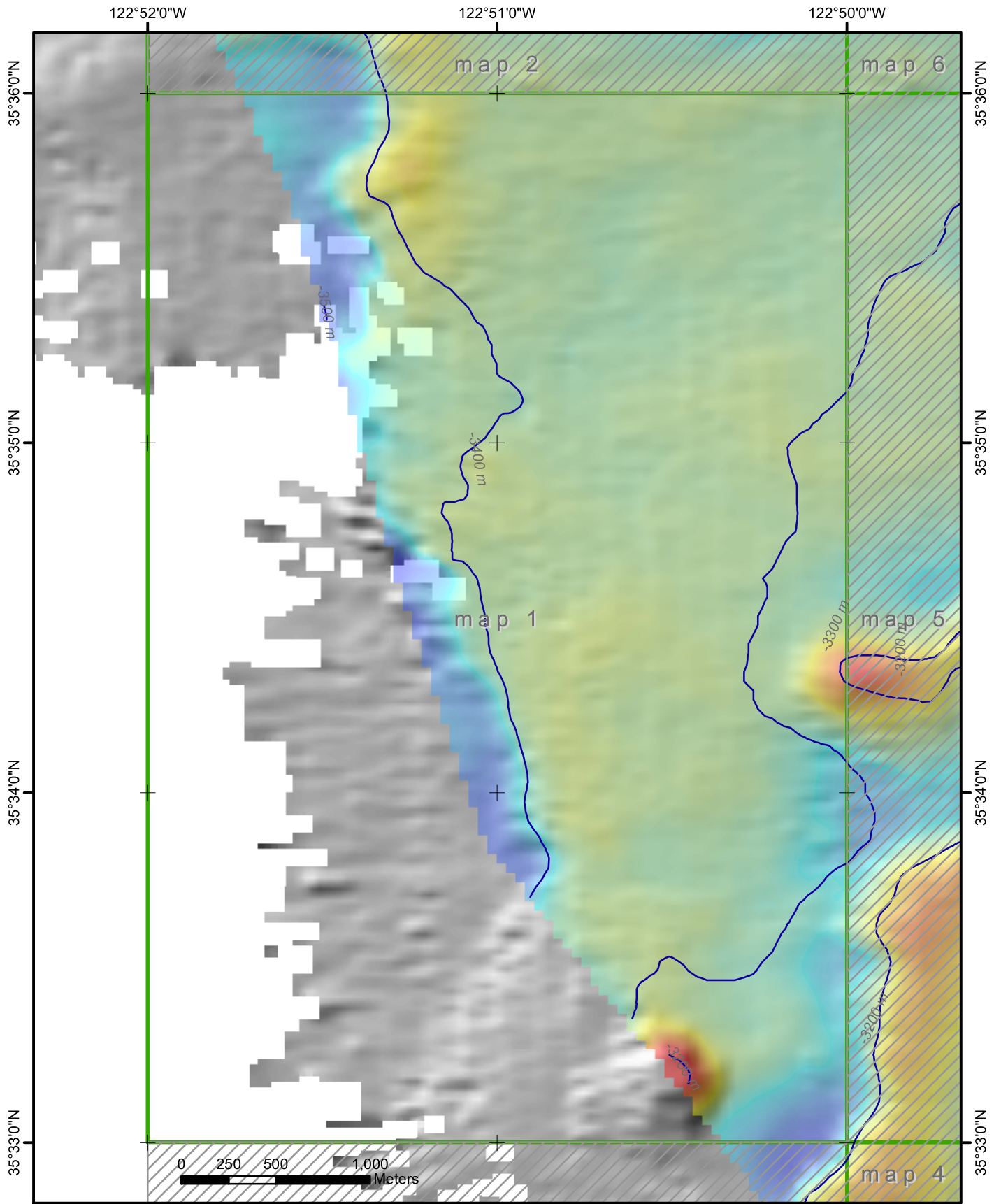
Map Book

Produced by

Chad King

Monterey Bay National Marine Sanctuary





2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis

25 cell BPI index (45 m cell res)

Value

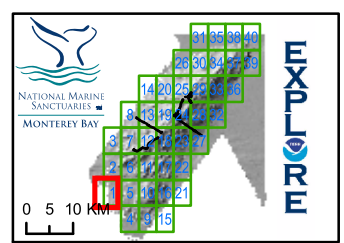
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 Low : -130

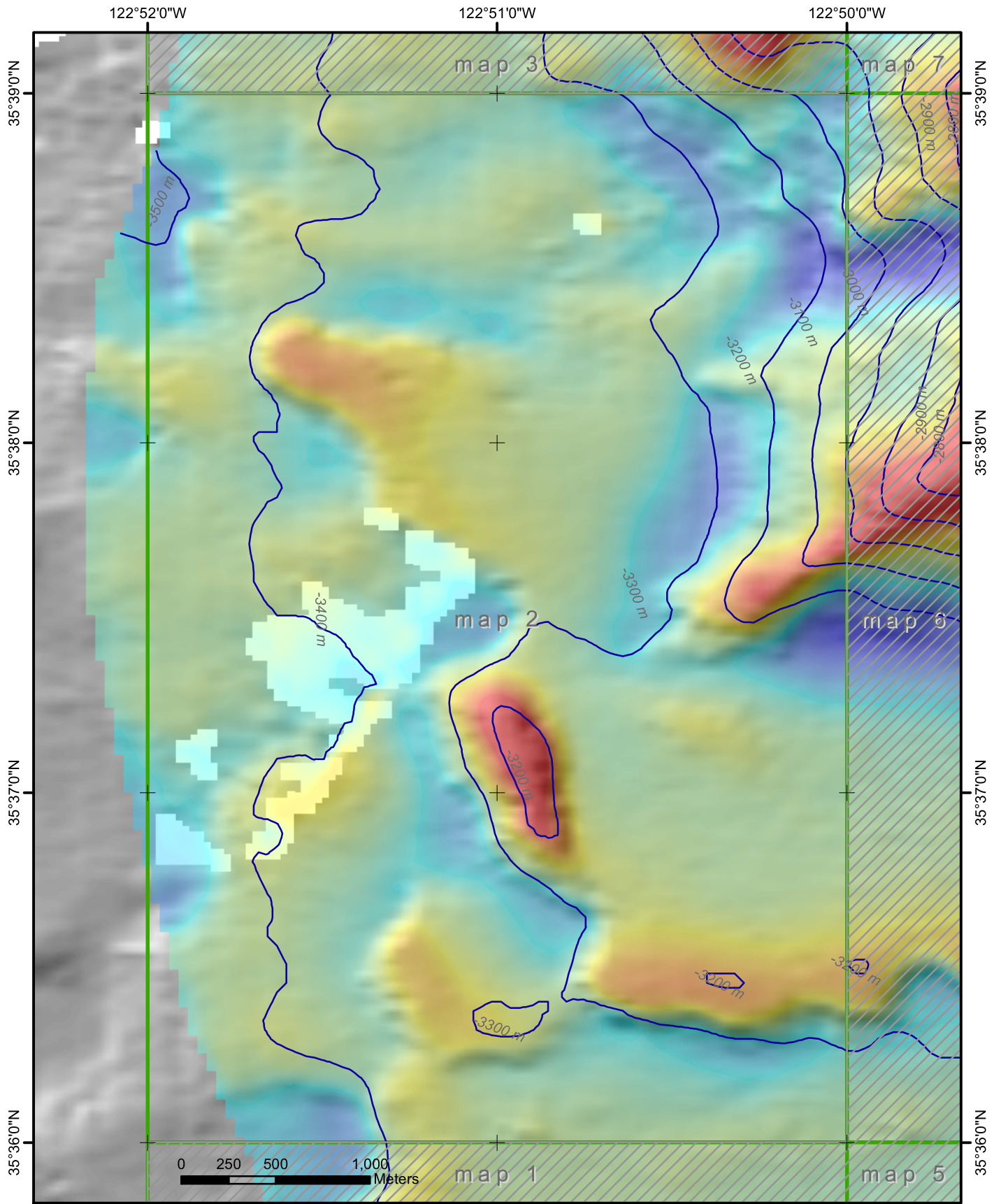
2002 Tiburon ROV tracklines

map index

- 2002 coral taxa**
- Bamboo coral
 - Anthipatharian
 - Anthomastus sp
 - Big Bonzai Gorgonian
 - Bushy Gorgonian
 - Glassy Gorgonian
 - Gold Gorgonian
 - Leaning Tower of Pisa Gorgonian
 - Orange Bottlebrush Coral
 - Orange Bushy Gorgonian
 - Paragorgia sp
 - Small Pink Gorgonian
 - Small Red Gorgonian
 - Small Yellow Gorgonian
 - Smaller Pink Chunky Gorgonian
 - White Gorgonian 1
 - White Gorgonian 2
 - White Gorgonian 3

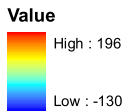
Map # 1 of 40
 1 centimeter equals 280 meters





**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

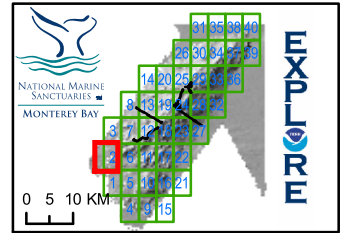
25 cell BPI index (45 m cell res) 2002 coral taxa



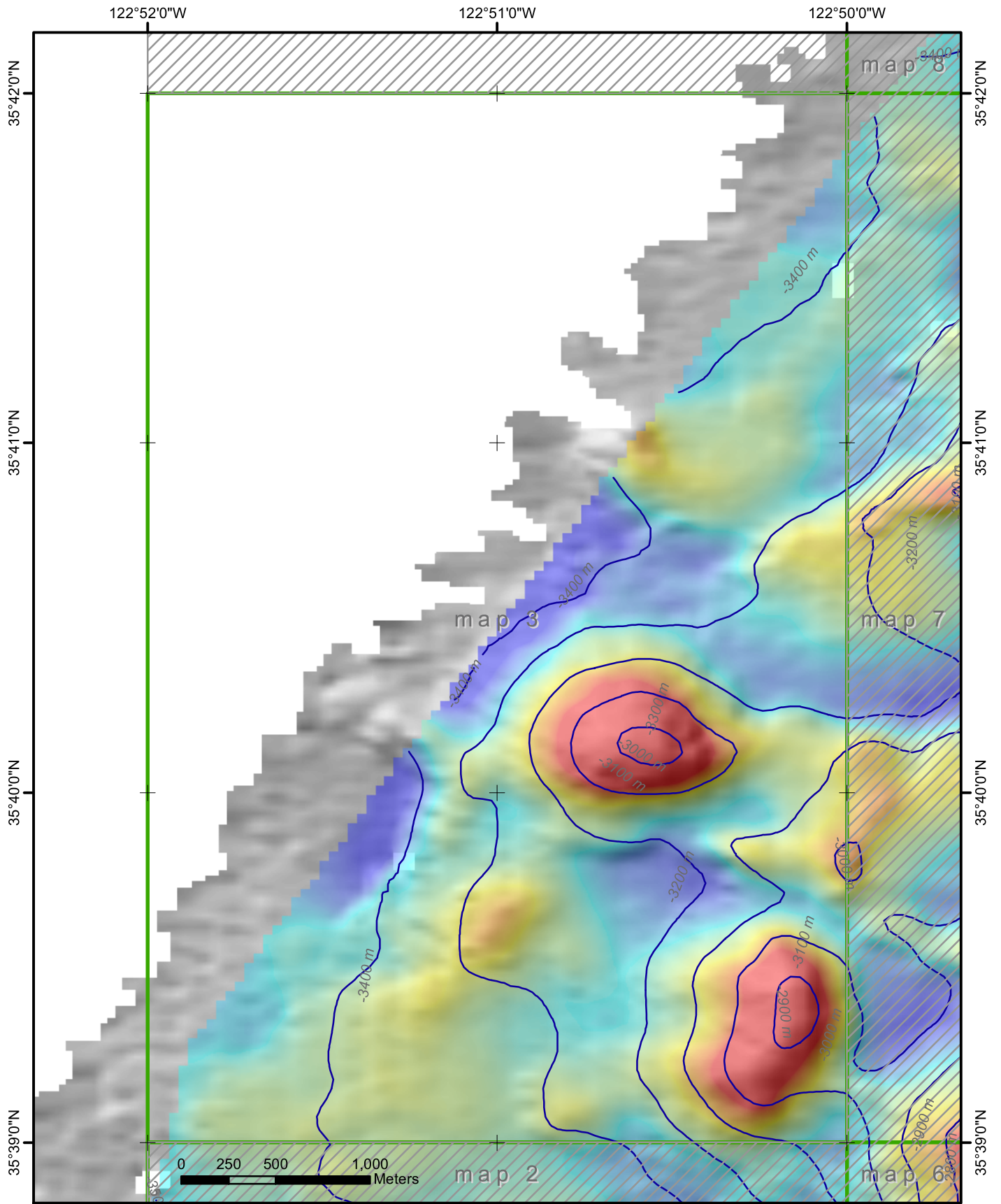
- 2002 Tiburon ROV tracklines
- map index

- | | | |
|----------------------|---------------------------------|-------------------------------|
| Bamboo coral | Gold Gorgonian | Small Yellow Gorgonian |
| Anthipatharian | Leaning Tower of Pisa Gorgonian | Smaller Pink Chunky Gorgonian |
| Anthomastus sp | Orange Bottlebrush Coral | White Gorgonian 1 |
| Big Bonzai Gorgonian | Orange Bushy Gorgonian | White Gorgonian 2 |
| Bushy Gorgonian | Paragorgia sp | White Gorgonian 3 |
| Glassy Gorgonian | Small Pink Gorgonian | |
| | Small Red Gorgonian | |

Map #2 of 40
1 centimeter equals 280 meters



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**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res)

Value

High : 196
Low : -130

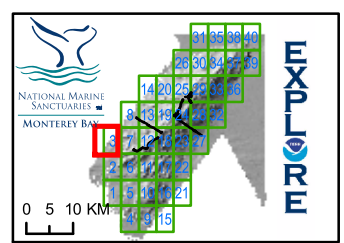
2002 Tiburon ROV tracklines

map index

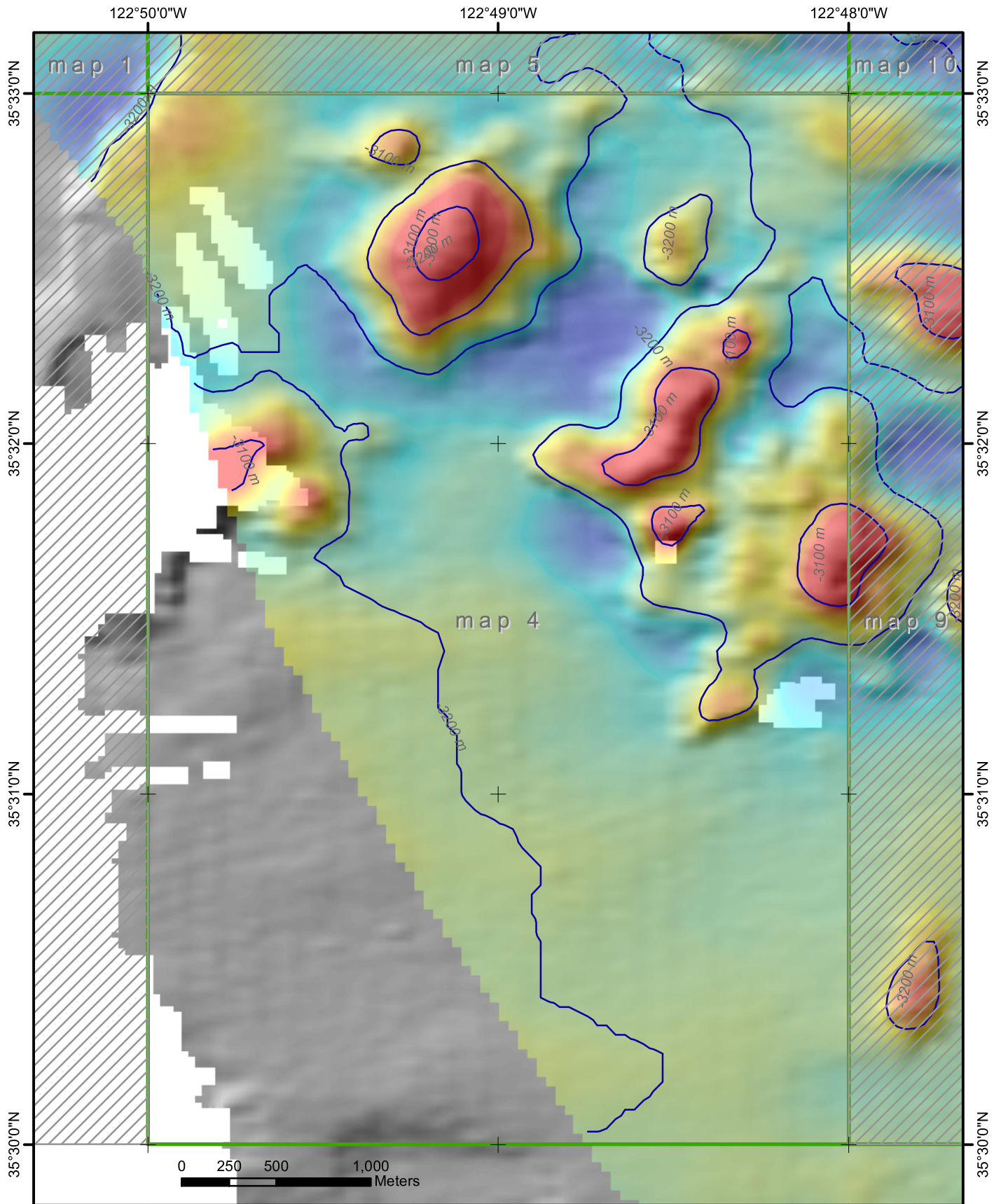


- 2002 coral taxa**
- Bamboo coral
 - Anthipatharian
 - Anthomastus sp
 - Big Bonzai Gorgonian
 - Bushy Gorgonian
 - Glassy Gorgonian
 - Gold Gorgonian
 - Leaning Tower of Pisa Gorgonian
 - Orange Bottlebrush Coral
 - Orange Bushy Gorgonian
 - Paragorgia sp
 - Small Pink Gorgonian
 - Small Red Gorgonian
 - Small Yellow Gorgonian
 - Smaller Pink Chunky Gorgonian
 - White Gorgonian 1
 - White Gorgonian 2
 - White Gorgonian 3

Map #3 of 40
1 centimeter equals 280 meters



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**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res) 2002 coral taxa

Value
High : 196
Low : -130



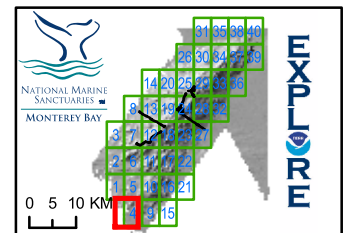
- 2002 Tiburon ROV tracklines
- map index

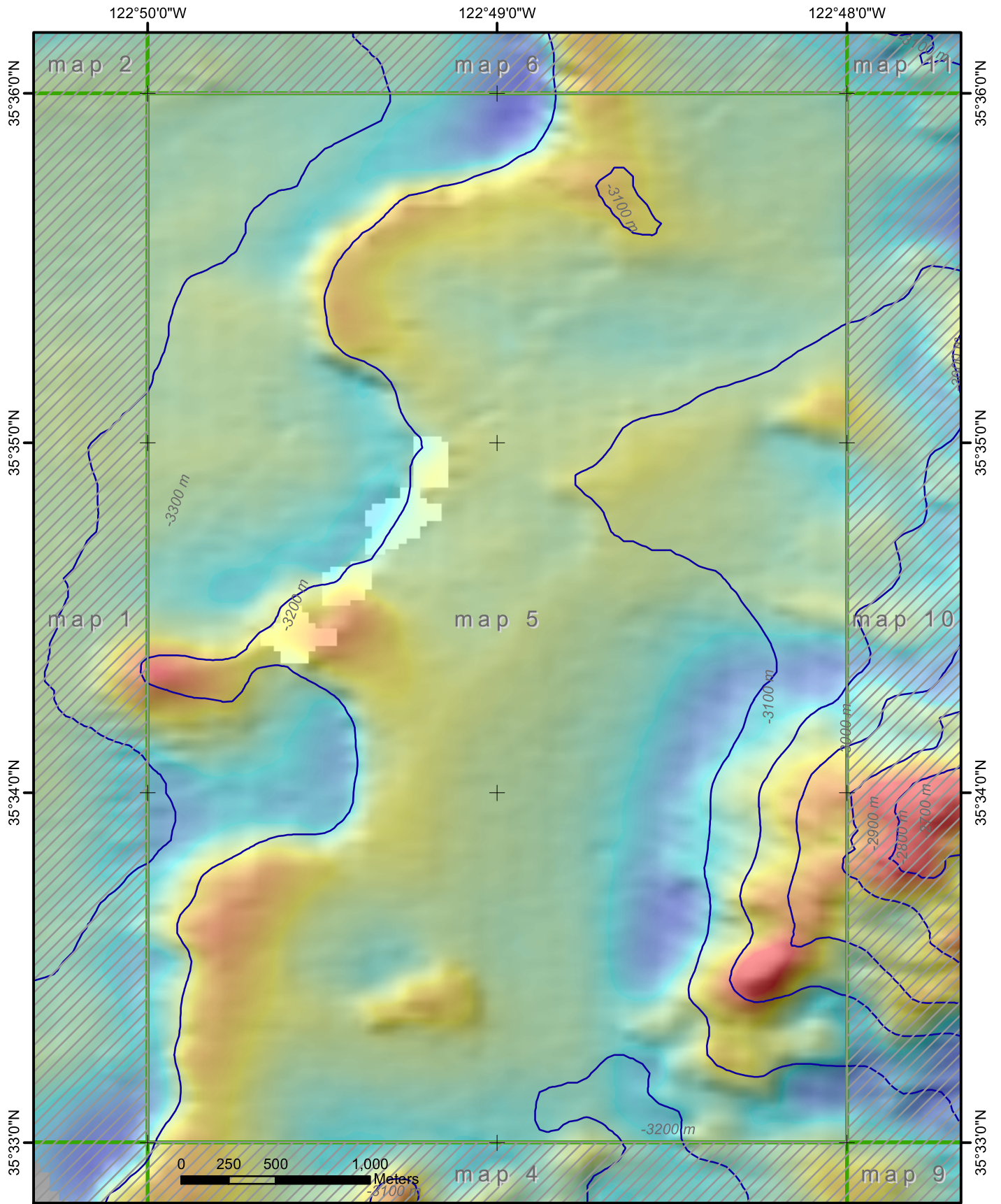
- Bamboo coral
- Anthipatharian
- Anthomastus sp
- Big Bonzai Gorgonian
- Bushy Gorgonian
- Glassy Gorgonian

- Gold Gorgonian
- Leaning Tower of Pisa Gorgonian
- Orange Bottlebrush Coral
- Orange Bushy Gorgonian
- Paragorgia sp
- Small Pink Gorgonian
- Small Red Gorgonian

- Small Yellow Gorgonian
- Smaller Pink Chunky Gorgonian
- White Gorgonian 1
- White Gorgonian 2
- White Gorgonian 3

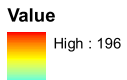
Map #4 of 40
1 centimeter equals 280 meters





**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

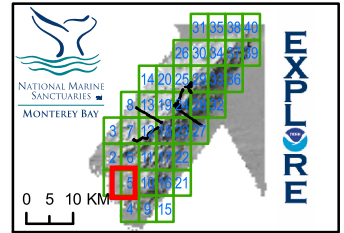
25 cell BPI index (45 m cell res) 2002 coral taxa

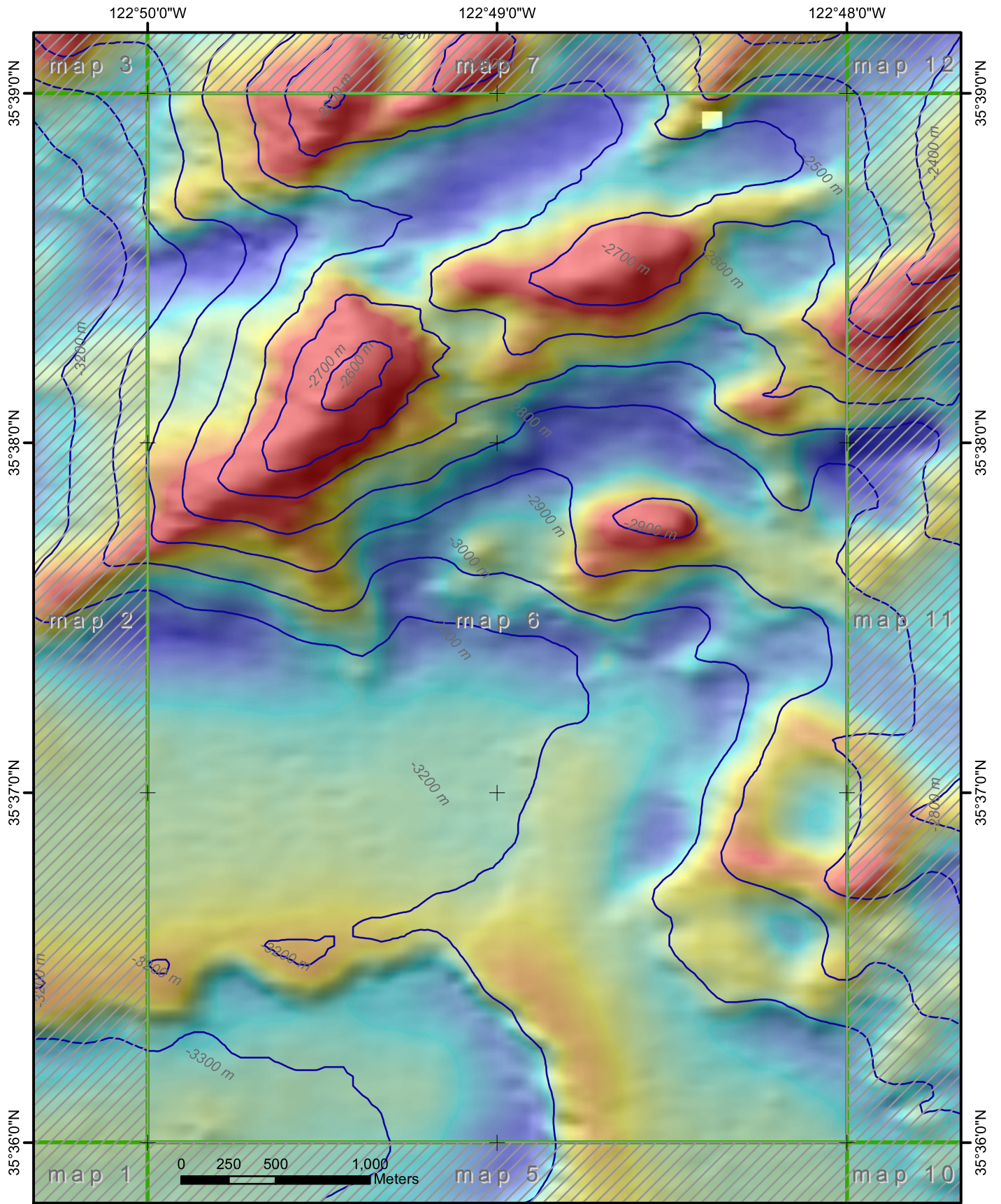


- 2002 Tiburon ROV tracklines
- map index

- | | | |
|----------------------|---------------------------------|-------------------------------|
| Bamboo coral | Gold Gorgonian | Small Yellow Gorgonian |
| Anthipatharian | Leaning Tower of Pisa Gorgonian | Smaller Pink Chunky Gorgonian |
| Anthomastus sp | Orange Bottlebrush Coral | White Gorgonian 1 |
| Big Bonzai Gorgonian | Orange Bushy Gorgonian | White Gorgonian 2 |
| Bushy Gorgonian | Paragorgia sp | White Gorgonian 3 |
| Glassy Gorgonian | Small Pink Gorgonian | |
| | Small Red Gorgonian | |

Map #5 of 40
1 centimeter equals 280 meters





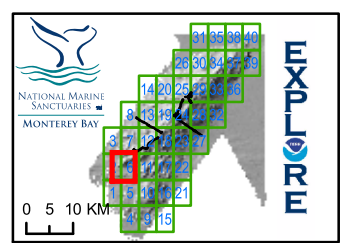
**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

- 25 cell BPI index (45 m cell res)**
- Value**
- High : 196
- Low : -130
- 2002 Tiburon ROV tracklines
- map index

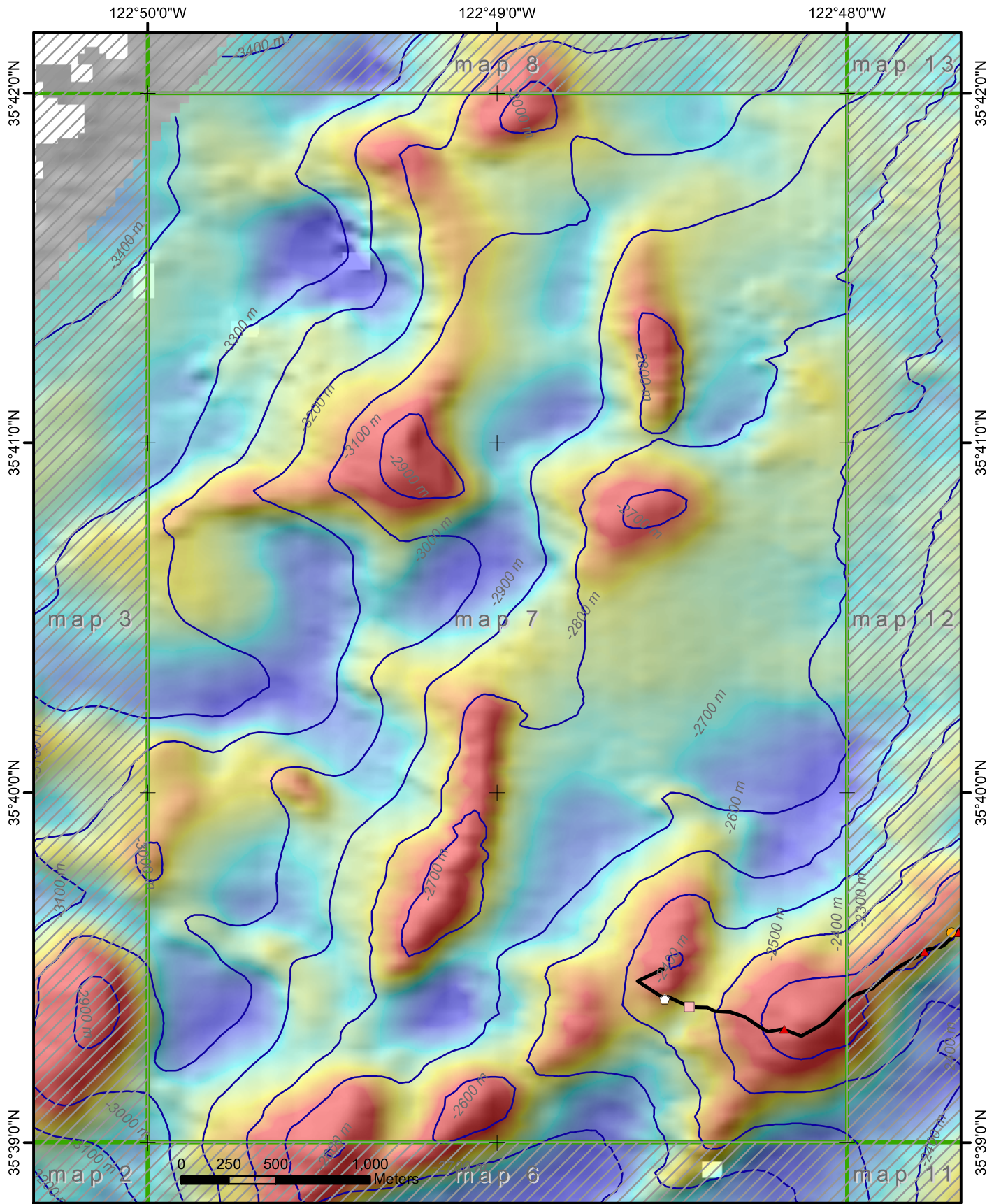


- 2002 coral taxa**
- Bamboo coral
 - ◆ Anthipatharian
 - ◆ Anthomastus sp
 - ◆ Big Bonzai Gorgonian
 - ◆ Bushy Gorgonian
 - Glassy Gorgonian
 - Gold Gorgonian
 - Leaning Tower of Pisa Gorgonian
 - Orange Bottlebrush Coral
 - ▲ Orange Bushy Gorgonian
 - ▲ Paragorgia sp
 - ▲ Small Pink Gorgonian
 - Small Red Gorgonian
 - Small Yellow Gorgonian
 - Smaller Pink Chunky Gorgonian
 - White Gorgonian 1
 - White Gorgonian 2
 - △ White Gorgonian 3

Map #6 of 40
1 centimeter equals 280 meters



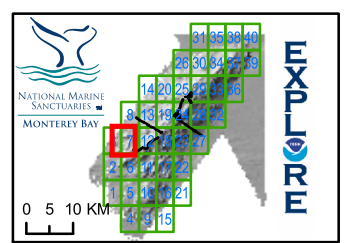
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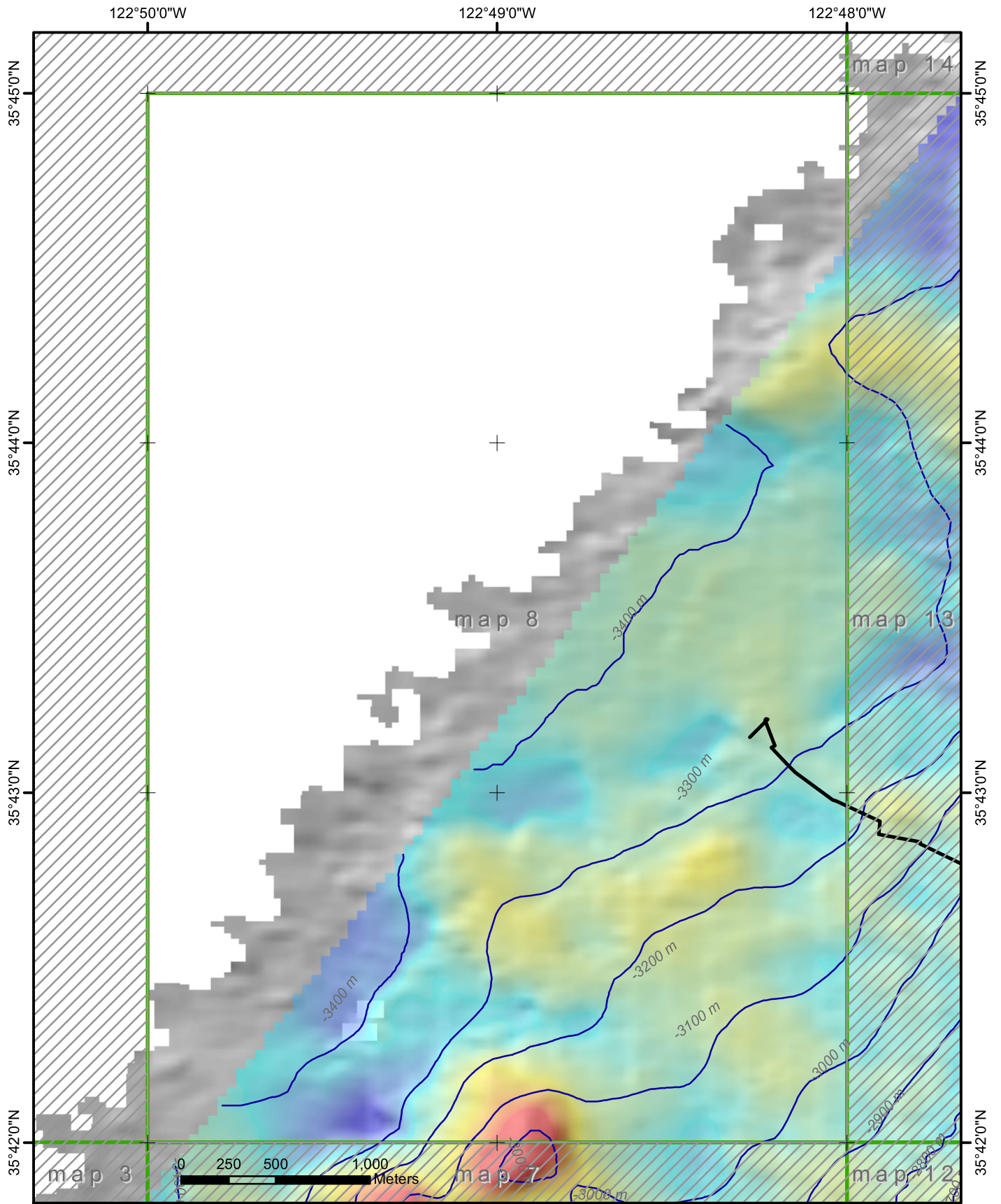
**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

- 25 cell BPI index (45 m cell res)**
- Value**
- High : 196
 - Low : -130
- 2002 coral taxa**
- Bamboo coral
 - Anthipatharian
 - Anthomastus sp
 - Big Bonzai Gorgonian
 - Bushy Gorgonian
 - Glassy Gorgonian
 - Gold Gorgonian
 - Leaning Tower of Pisa Gorgonian
 - Orange Bottlebrush Coral
 - Orange Bushy Gorgonian
 - Paragorgia sp
 - Small Pink Gorgonian
 - Small Red Gorgonian
 - Small Yellow Gorgonian
 - Smaller Pink Chunky Gorgonian
 - White Gorgonian 1
 - White Gorgonian 2
 - White Gorgonian 3
- 2002 Tiburon ROV tracklines**
- map index

Map #7 of 40
1 centimeter equals 280 meters



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**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res)

Value

High : 196
Low : -130

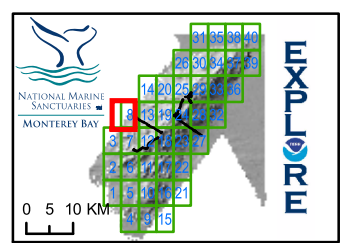
2002 Tiburon ROV tracklines

map index

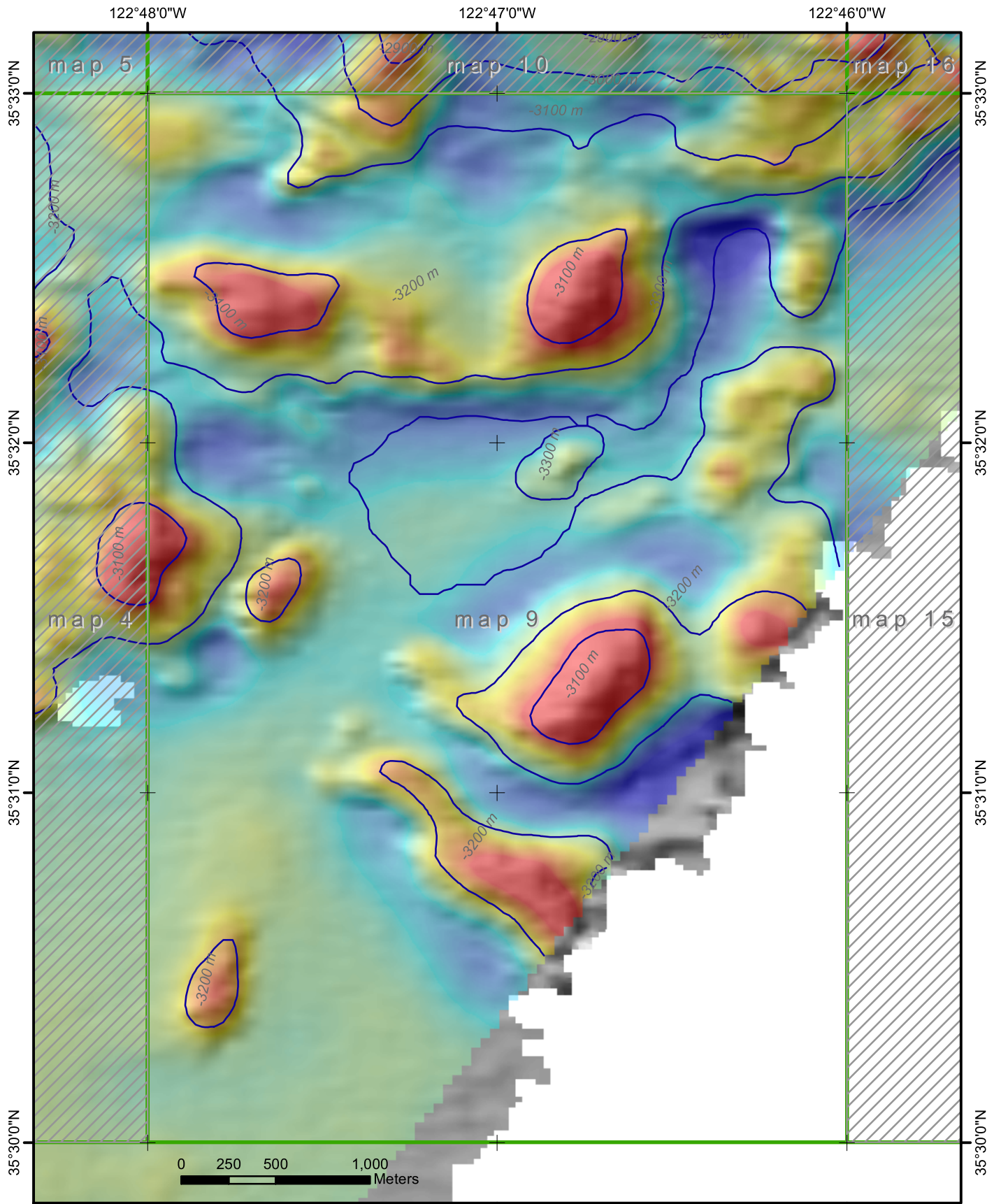


- 2002 coral taxa**
- Bamboo coral
 - Anthipatharian
 - Anthomastus sp
 - Big Bonzai Gorgonian
 - Bushy Gorgonian
 - Glassy Gorgonian
 - Gold Gorgonian
 - Leaning Tower of Pisa Gorgonian
 - Orange Bottlebrush Coral
 - Orange Bushy Gorgonian
 - Paragorgia sp
 - Small Pink Gorgonian
 - Small Red Gorgonian
 - Small Yellow Gorgonian
 - Smaller Pink Chunky Gorgonian
 - White Gorgonian 1
 - White Gorgonian 2
 - White Gorgonian 3

Map #8 of 40
1 centimeter equals 280 meters



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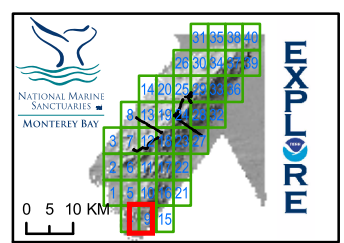
**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

- 25 cell BPI index (45 m cell res)**
- Value**
- High : 196
- Low : -130
- 2002 Tiburon ROV tracklines
- map index

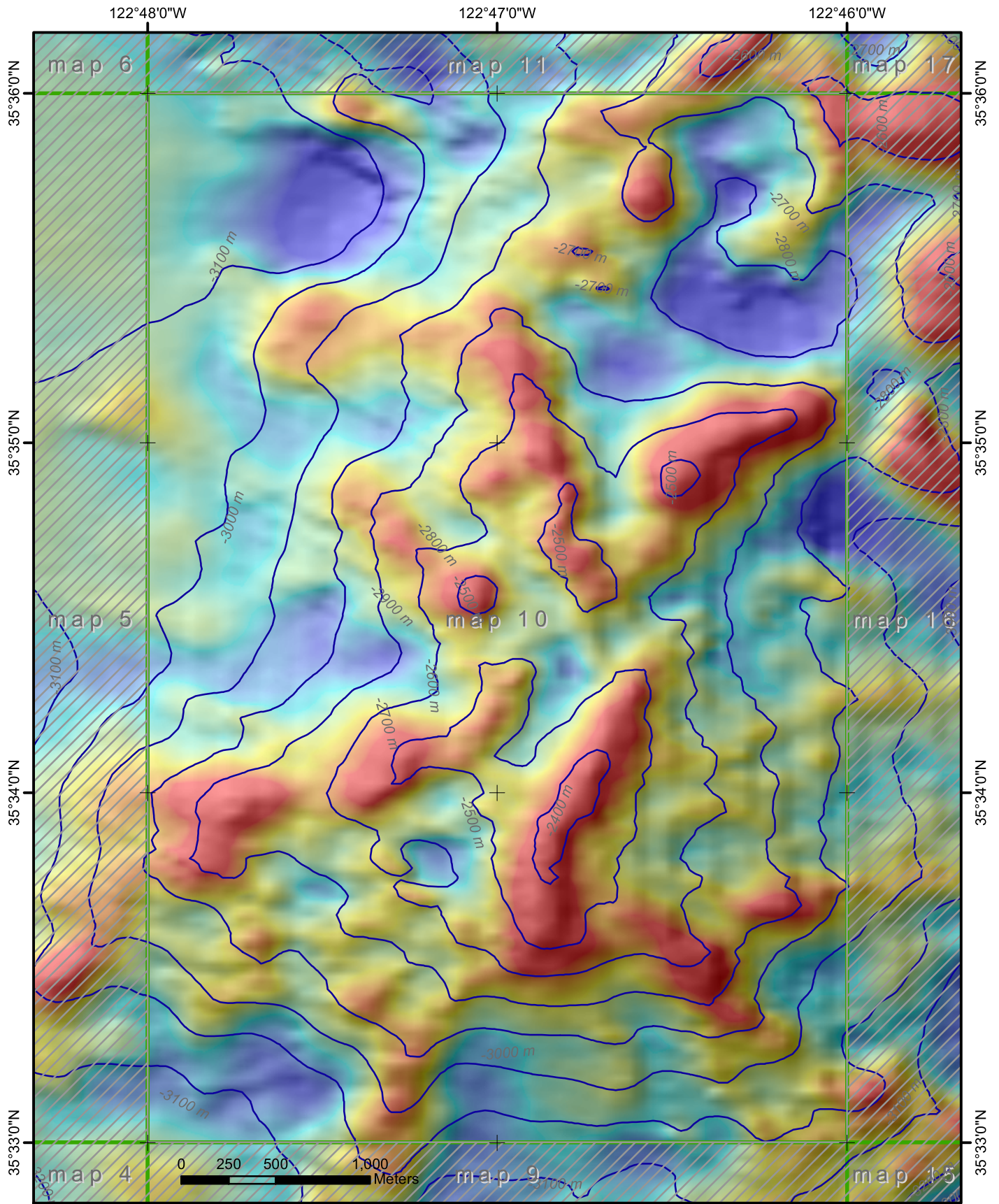


- 2002 coral taxa**
- Bamboo coral
 - ◆ Anthipatharian
 - ◆ Anthomastus sp
 - ◆ Big Bonzai Gorgonian
 - ◆ Bushy Gorgonian
 - Glassy Gorgonian
 - Gold Gorgonian
 - Leaning Tower of Pisa Gorgonian
 - Orange Bottlebrush Coral
 - ▲ Orange Bushy Gorgonian
 - ▲ Paragorgia sp
 - Small Pink Gorgonian
 - Small Red Gorgonian
 - Small Yellow Gorgonian
 - Smaller Pink Chunky Gorgonian
 - White Gorgonian 1
 - White Gorgonian 2
 - △ White Gorgonian 3

Map #9 of 40
1 centimeter equals 280 meters

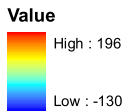


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**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

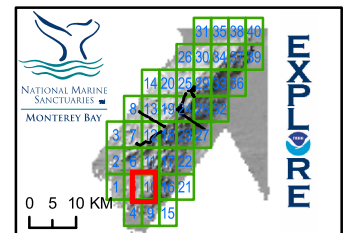
25 cell BPI index (45 m cell res) 2002 coral taxa



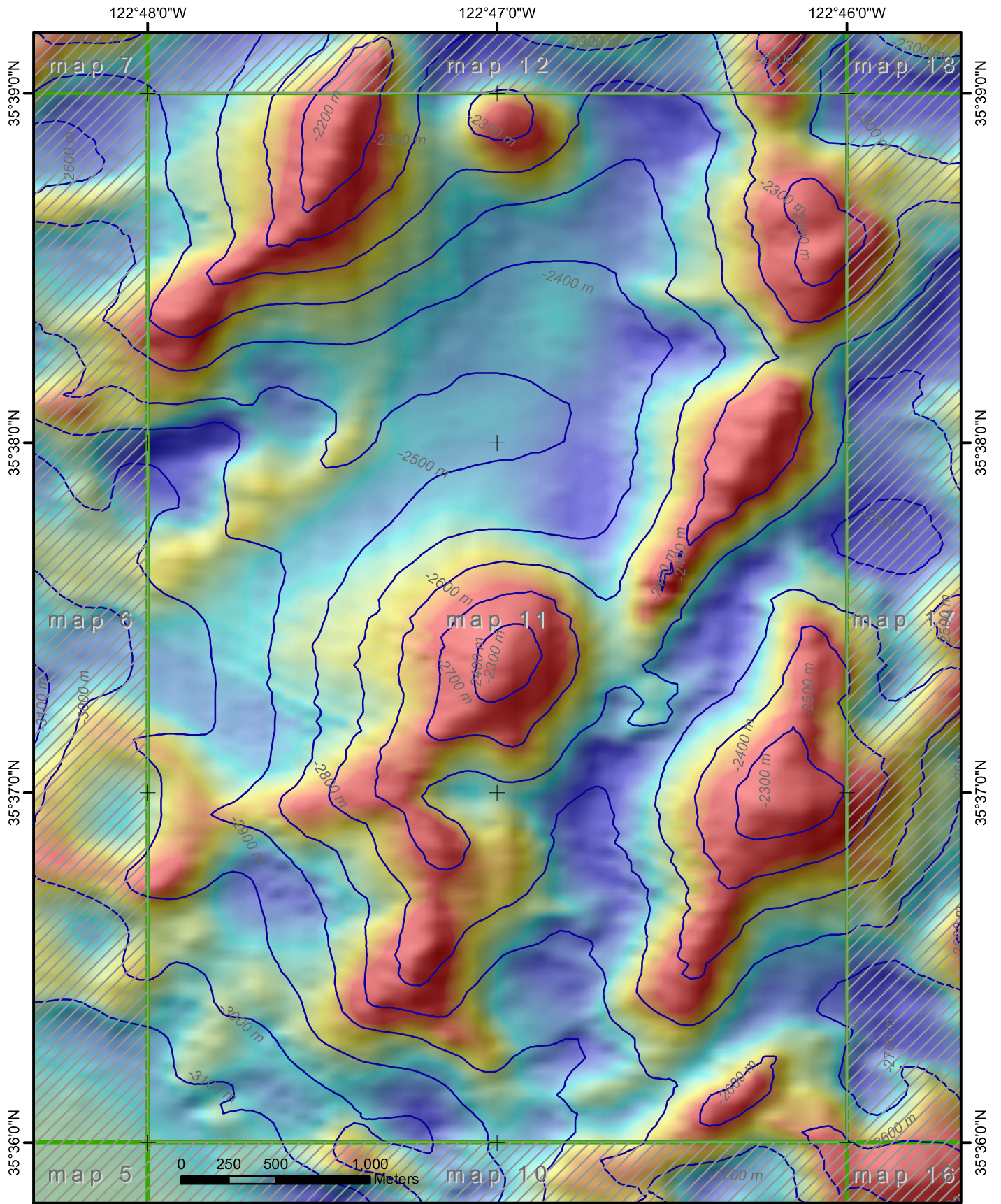
2002 Tiburon ROV tracklines
map index

- | | | |
|----------------------|---------------------------------|-------------------------------|
| Bamboo coral | Gold Gorgonian | Small Yellow Gorgonian |
| Anthipatharian | Leaning Tower of Pisa Gorgonian | Smaller Pink Chunky Gorgonian |
| Anthomastus sp | Orange Bottlebrush Coral | White Gorgonian 1 |
| Big Bonzai Gorgonian | Orange Bushy Gorgonian | White Gorgonian 2 |
| Bushy Gorgonian | Paragorgia sp | White Gorgonian 3 |
| Glassy Gorgonian | Small Pink Gorgonian | |
| | Small Red Gorgonian | |

Map # 10 of 40
1 centimeter equals 280 meters



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**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res) 2002 coral taxa

Value

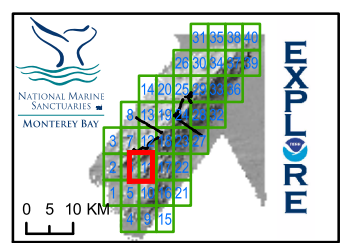
 High : 196
 Low : -130

2002 Tiburon ROV tracklines
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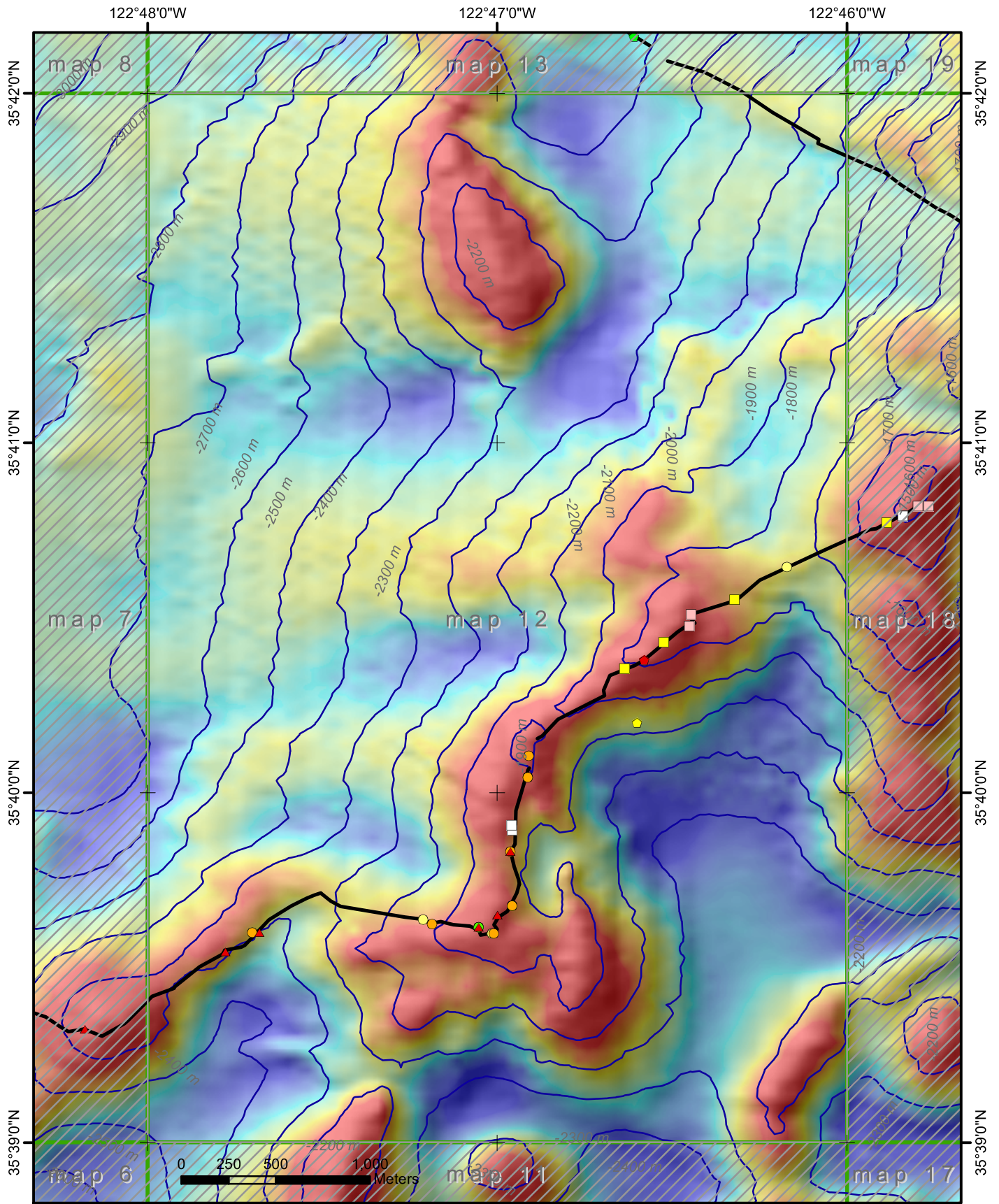


- | | | |
|----------------------|---------------------------------|-------------------------------|
| Bamboo coral | Gold Gorgonian | Small Yellow Gorgonian |
| Anthipatharian | Leaning Tower of Pisa Gorgonian | Smaller Pink Chunky Gorgonian |
| Anthomastus sp | Orange Bottlebrush Coral | White Gorgonian 1 |
| Big Bonzai Gorgonian | Orange Bushy Gorgonian | White Gorgonian 2 |
| Bushy Gorgonian | Paragorgia sp | White Gorgonian 3 |
| Glassy Gorgonian | Small Pink Gorgonian | |
| | Small Red Gorgonian | |

Map # 11 of 40
 1 centimeter equals 280 meters

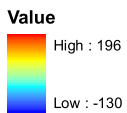


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**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res)

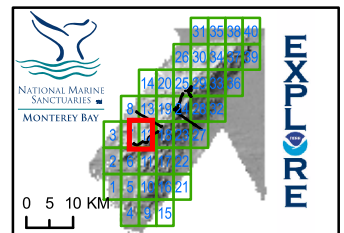


2002 Tiburon ROV tracklines
map index

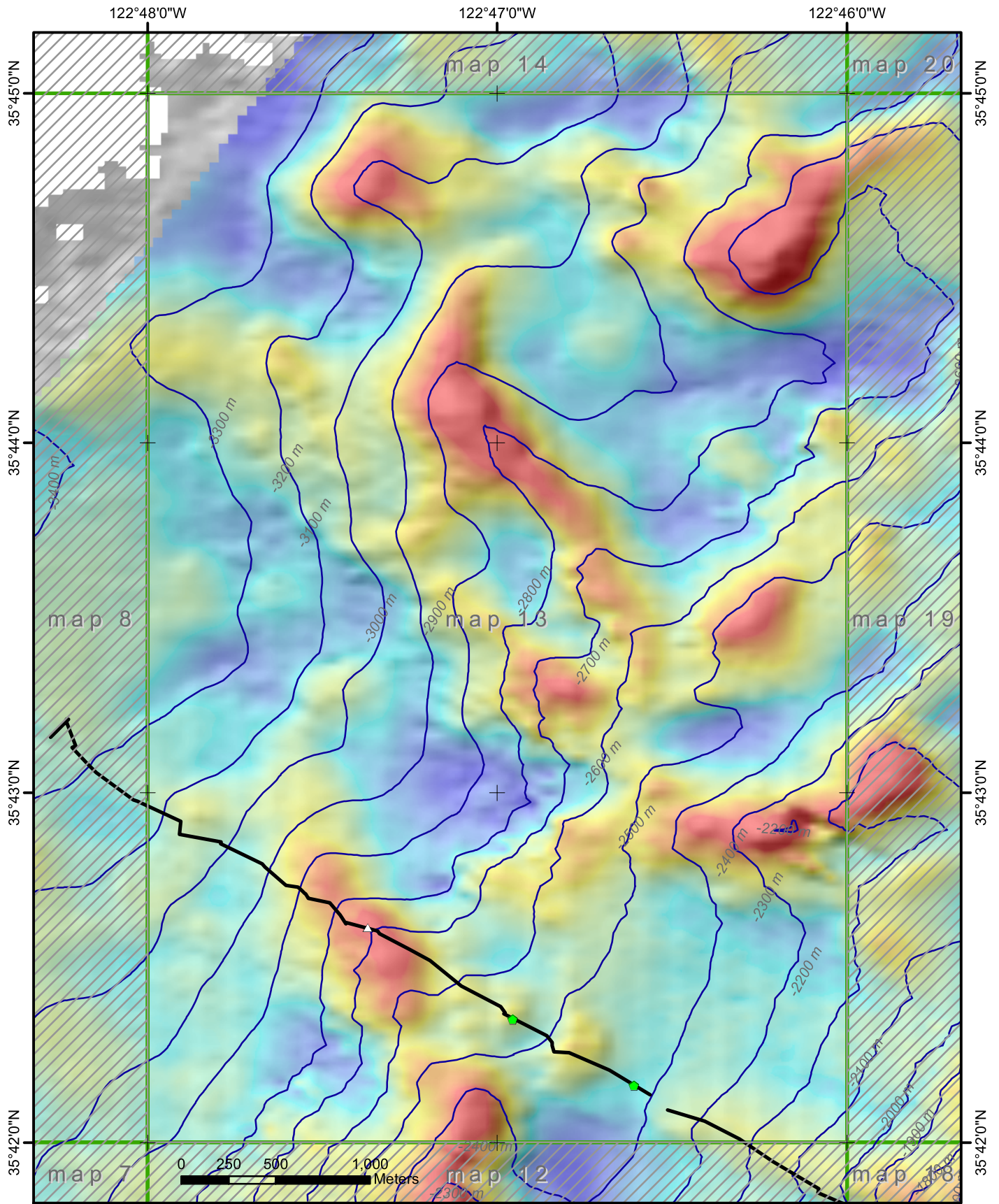


- | | | |
|----------------------|---------------------------------|-------------------------------|
| Bamboo coral | Gold Gorgonian | Small Yellow Gorgonian |
| Anthipatharian | Leaning Tower of Pisa Gorgonian | Smaller Pink Chunky Gorgonian |
| Anthomastus sp | Orange Bottlebrush Coral | White Gorgonian 1 |
| Big Bonzai Gorgonian | Orange Bushy Gorgonian | White Gorgonian 2 |
| Bushy Gorgonian | Paragorgia sp | White Gorgonian 3 |
| Glassy Gorgonian | Small Pink Gorgonian | Small Red Gorgonian |

Map # 12 of 40
1 centimeter equals 280 meters

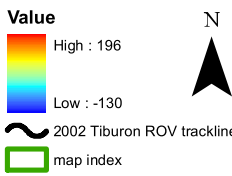


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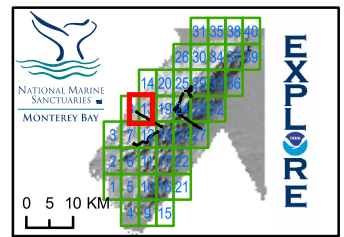
**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res) 2002 coral taxa

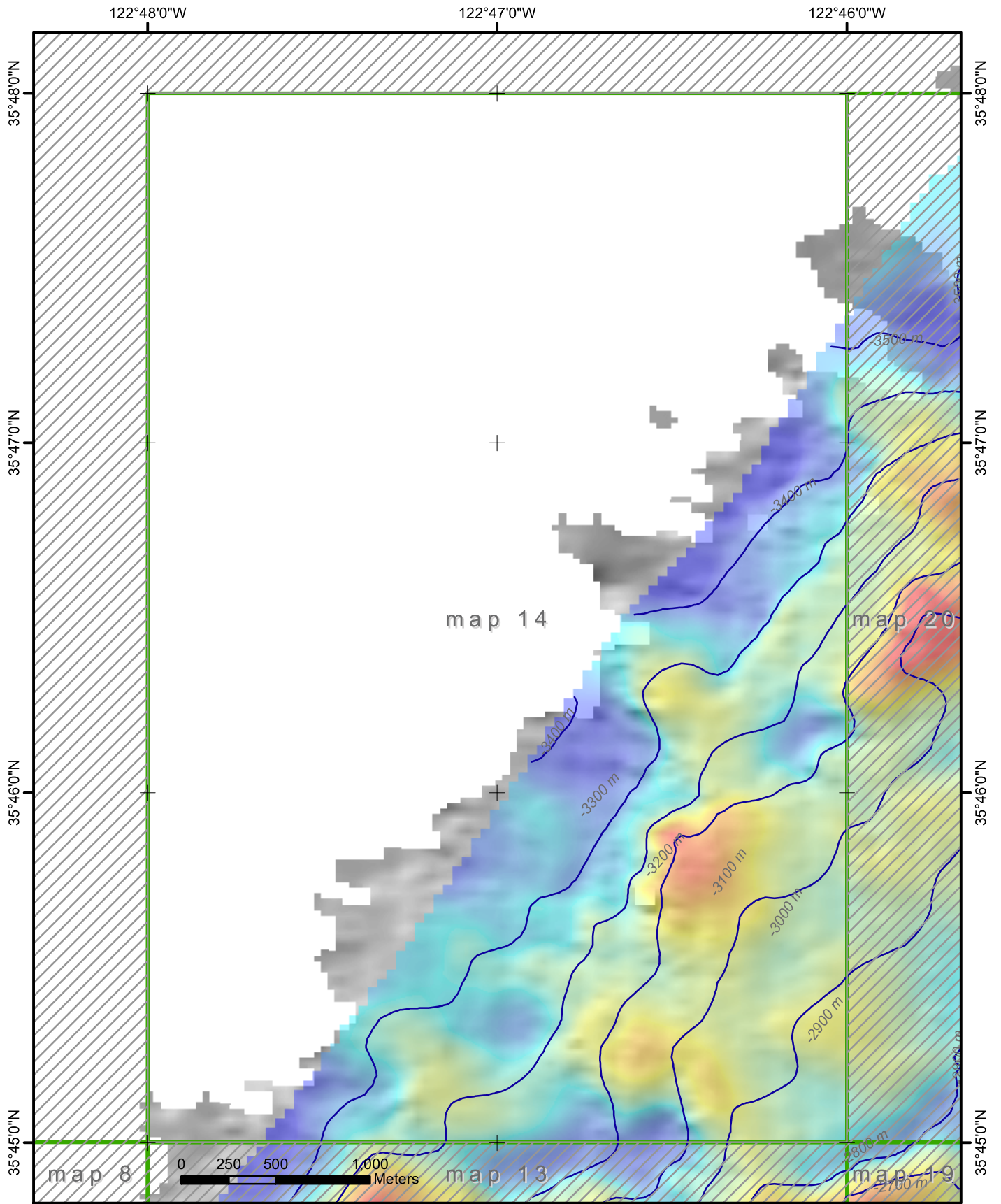


- | | | |
|----------------------|---------------------------------|-------------------------------|
| Bamboo coral | Gold Gorgonian | Small Yellow Gorgonian |
| Anthipatharian | Leaning Tower of Pisa Gorgonian | Smaller Pink Chunky Gorgonian |
| Anthomastus sp | Orange Bottlebrush Coral | White Gorgonian 1 |
| Big Bonzai Gorgonian | Orange Bushy Gorgonian | White Gorgonian 2 |
| Bushy Gorgonian | Paragorgia sp | White Gorgonian 3 |
| Glassy Gorgonian | Small Pink Gorgonian | |
| | Small Red Gorgonian | |

Map # 13 of 40
1 centimeter equals 280 meters



Chad King - MBNMS - Jan '06



**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res)

Value

High : 196

Low : -130

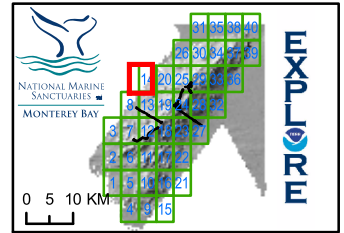
2002 Tiburon ROV tracklines

map index

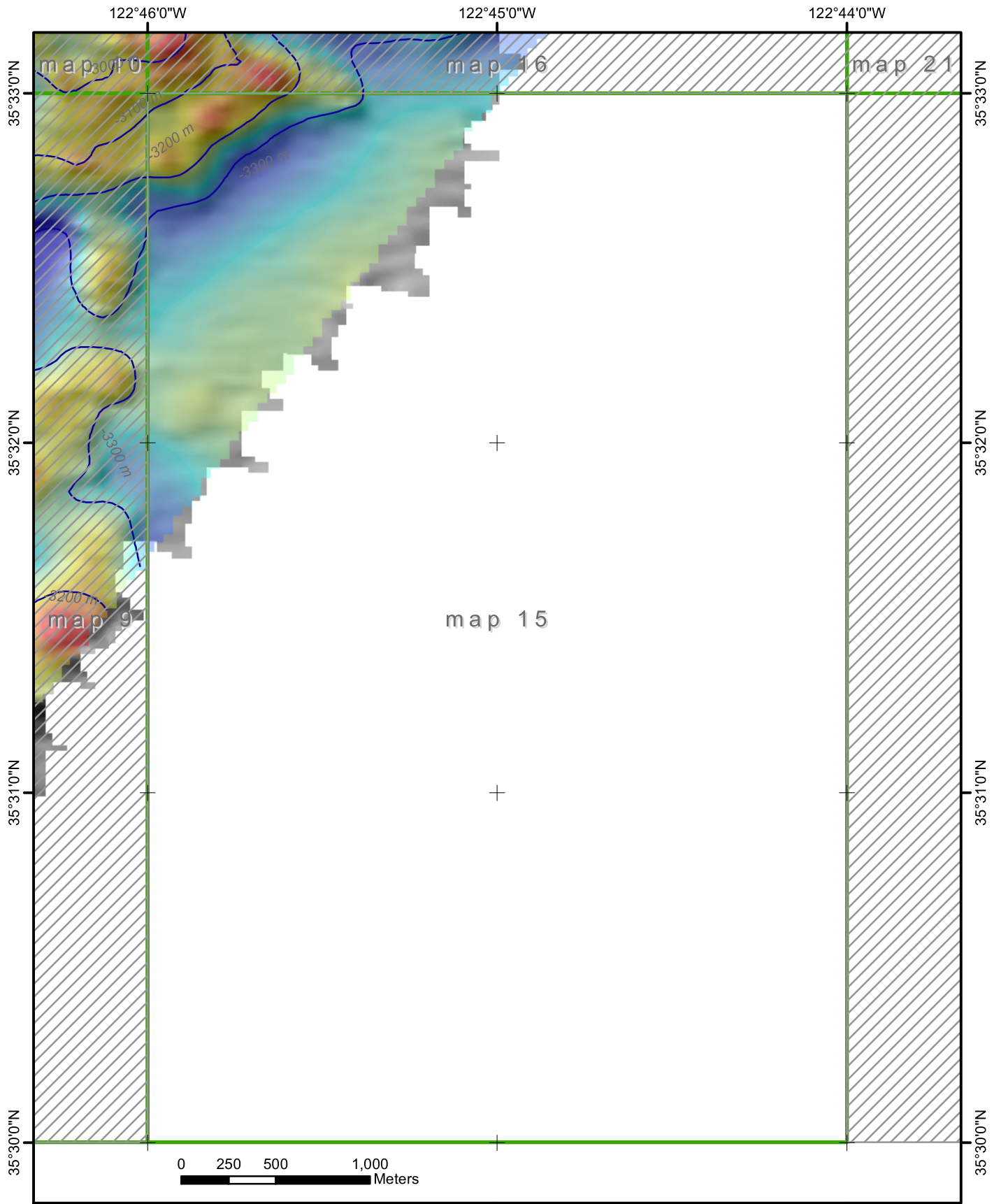


- | | | |
|----------------------|---------------------------------|-------------------------------|
| Bamboo coral | Gold Gorgonian | Small Yellow Gorgonian |
| Anthipatharian | Leaning Tower of Pisa Gorgonian | Smaller Pink Chunky Gorgonian |
| Anthomastus sp | Orange Bottlebrush Coral | White Gorgonian 1 |
| Big Bonzai Gorgonian | Orange Bushy Gorgonian | White Gorgonian 2 |
| Bushy Gorgonian | Paragorgia sp | White Gorgonian 3 |
| Glassy Gorgonian | Small Pink Gorgonian | Small Red Gorgonian |

Map # 14 of 40
1 centimeter equals 280 meters



Chad King - MBNMS - Jan '06



**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res)

Value

High : 196
Low : -130

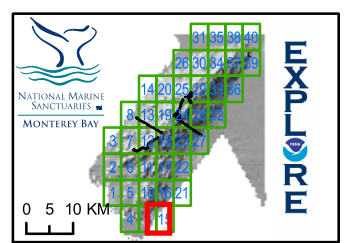
2002 Tiburon ROV tracklines

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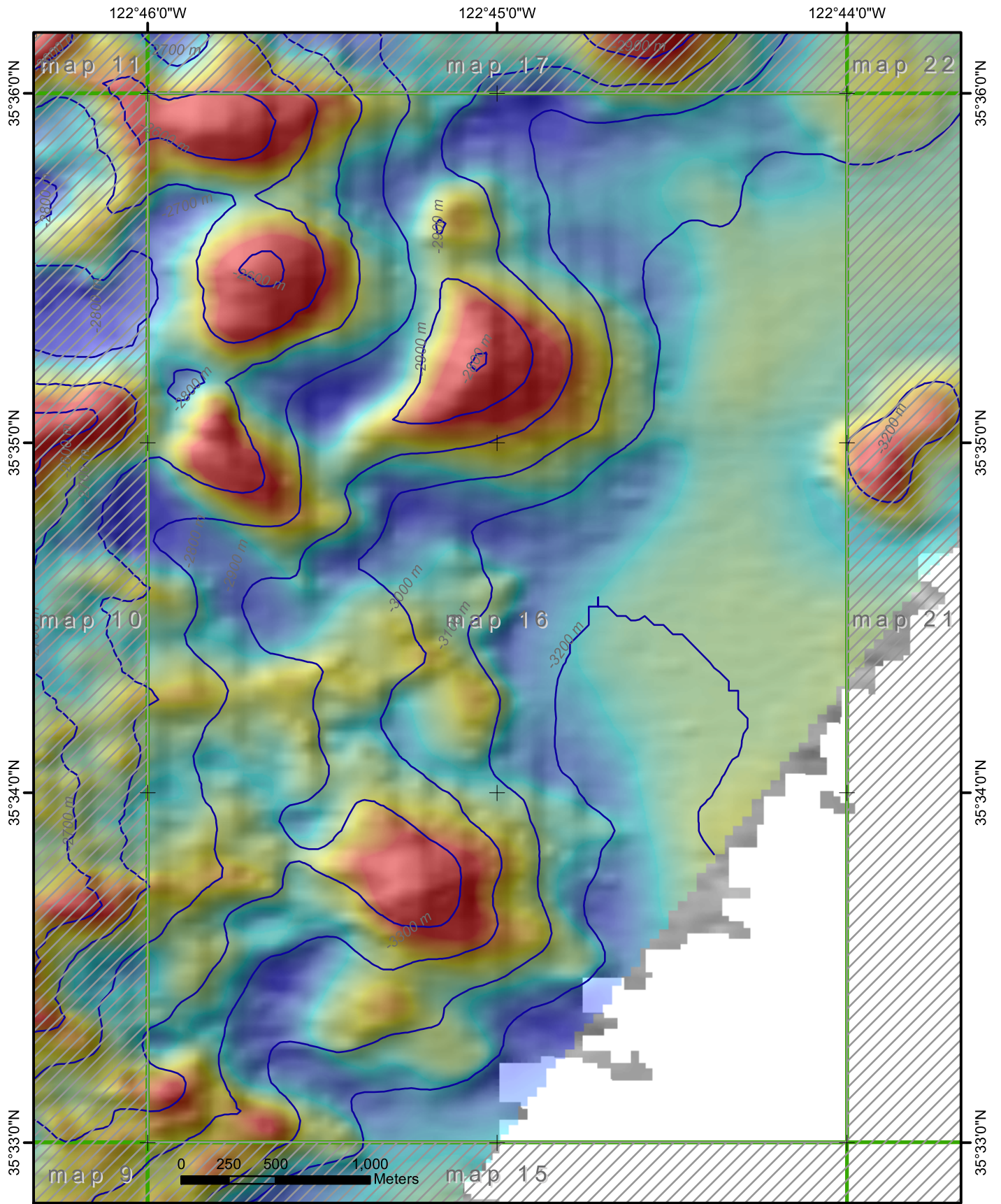


- 2002 coral taxa**
- Bamboo coral
 - Anthipatharian
 - Anthomastus sp
 - Big Bonzai Gorgonian
 - Bushy Gorgonian
 - Glassy Gorgonian
 - Gold Gorgonian
 - Leaning Tower of Pisa Gorgonian
 - Orange Bottlebrush Coral
 - Orange Bushy Gorgonian
 - Paragorgia sp
 - Small Pink Gorgonian
 - Small Red Gorgonian
 - Small Yellow Gorgonian
 - Smaller Pink Chunky Gorgonian
 - White Gorgonian 1
 - White Gorgonian 2
 - White Gorgonian 3

Map # 15 of 40
1 centimeter equals 280 meters



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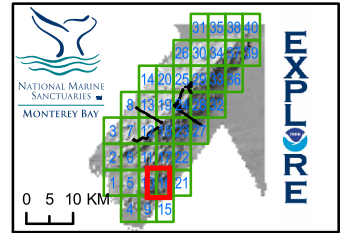
**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

- 25 cell BPI index (45 m cell res)**
- Value**
- High : 196
- Low : -130
- 2002 Tiburon ROV tracklines
- map index

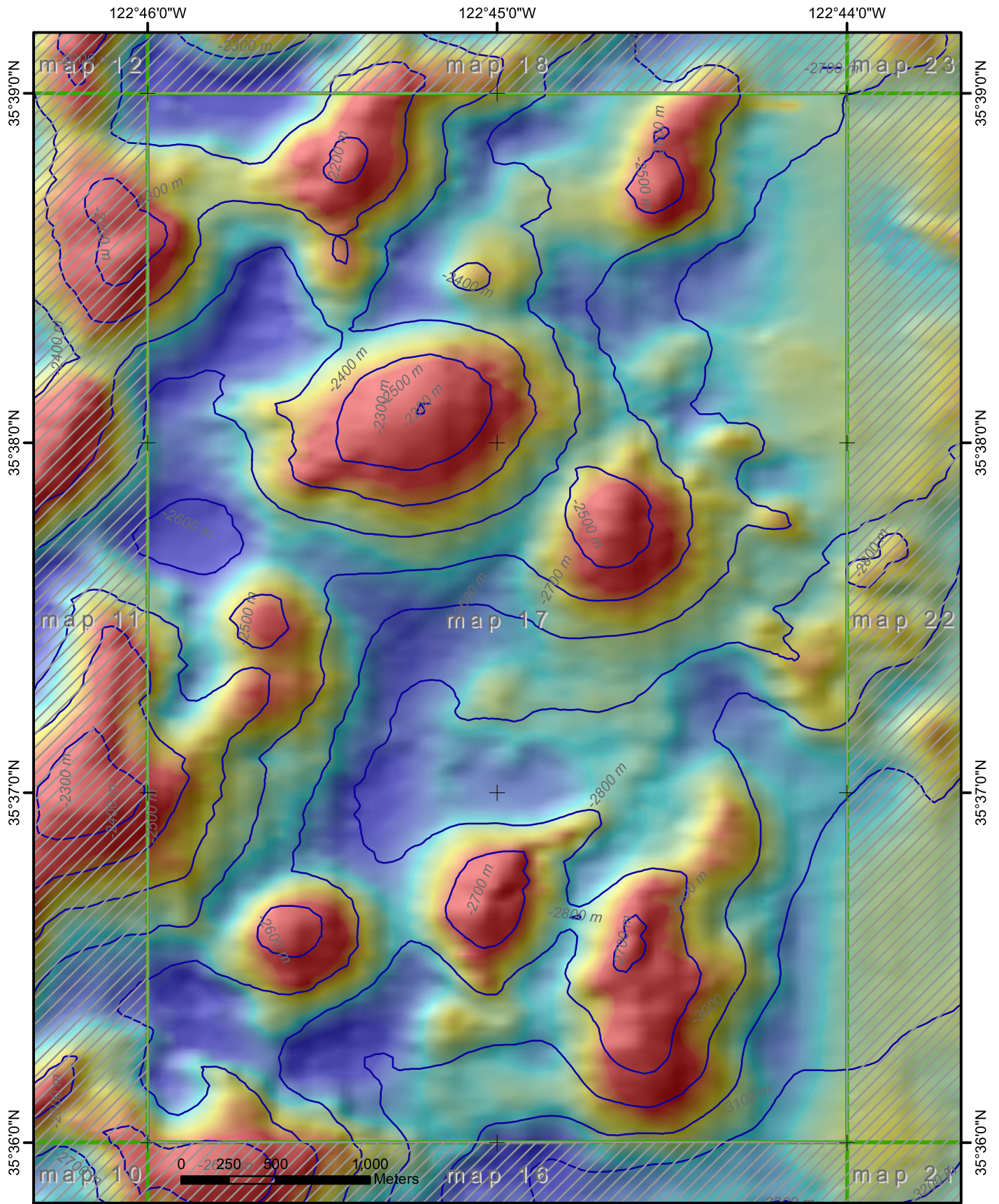


- 2002 coral taxa**
- Bamboo coral
 - ◆ Anthipatharian
 - ◆ Anthomastus sp
 - ◆ Big Bonzai Gorgonian
 - ◆ Bushy Gorgonian
 - Glassy Gorgonian
 - Gold Gorgonian
 - Leaning Tower of Pisa Gorgonian
 - Orange Bottlebrush Coral
 - ▲ Orange Bushy Gorgonian
 - ▲ Paragorgia sp
 - Small Pink Gorgonian
 - Small Red Gorgonian
 - Small Yellow Gorgonian
 - Smaller Pink Chunky Gorgonian
 - White Gorgonian 1
 - White Gorgonian 2
 - △ White Gorgonian 3

Map # 16 of 40
1 centimeter equals 280 meters

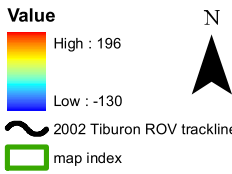


Chad King - MBNMS - Jan '06



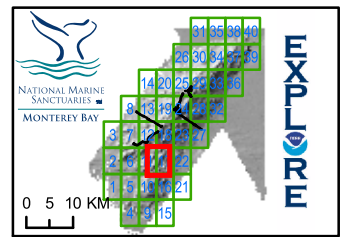
**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res) 2002 coral taxa

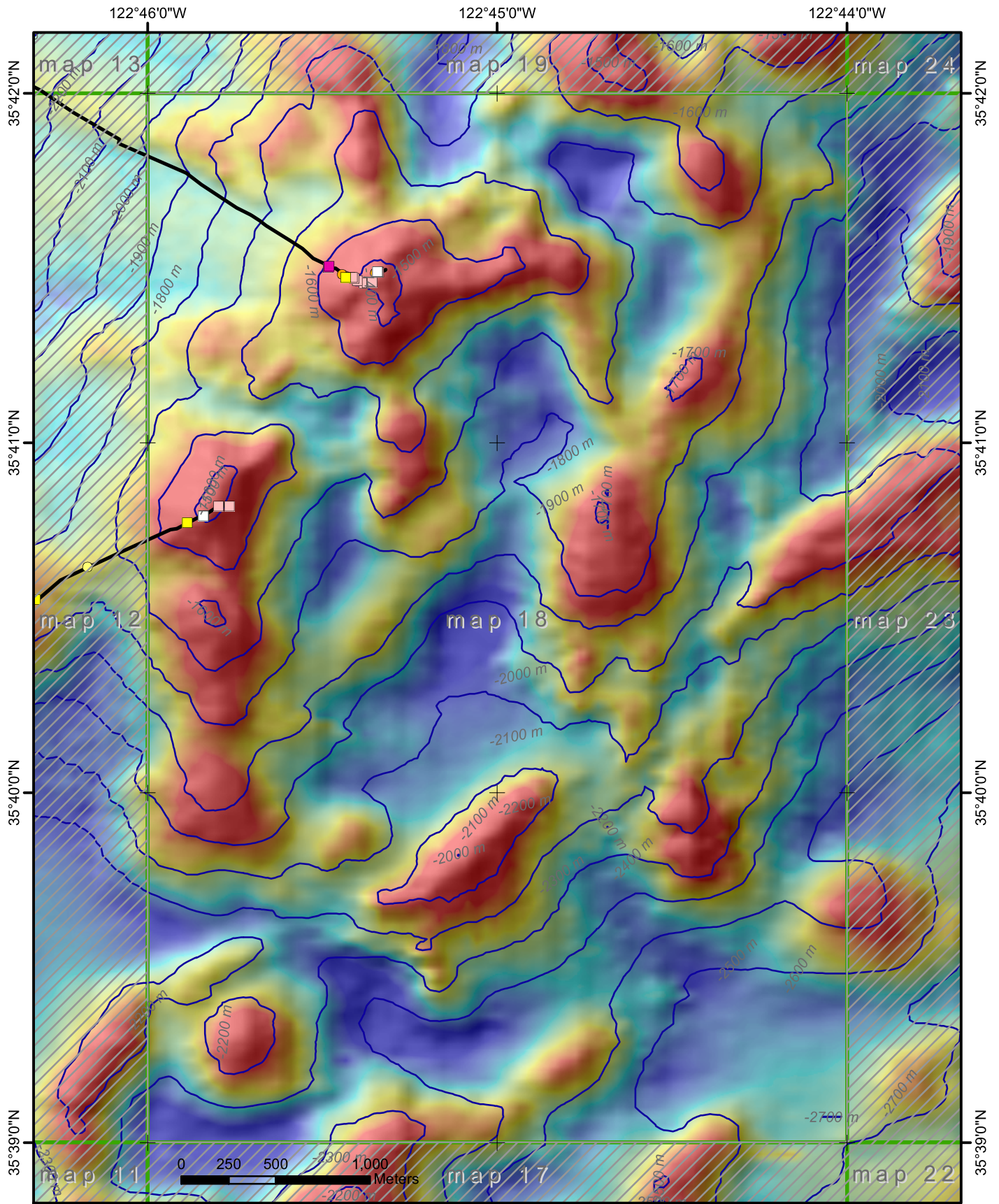


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|----------------------|---------------------------------|-------------------------------|
| Bamboo coral | Gold Gorgonian | Small Yellow Gorgonian |
| Anthipatharian | Leaning Tower of Pisa Gorgonian | Smaller Pink Chunky Gorgonian |
| Anthomastus sp | Orange Bottlebrush Coral | White Gorgonian 1 |
| Big Bonzai Gorgonian | Orange Bushy Gorgonian | White Gorgonian 2 |
| Bushy Gorgonian | Paragorgia sp | White Gorgonian 3 |
| Glassy Gorgonian | Small Pink Gorgonian | |
| | Small Red Gorgonian | |

Map # 17 of 40
1 centimeter equals 280 meters

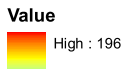


Chad King - MBNMS - Jan '06



**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

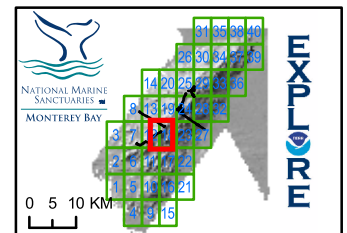
25 cell BPI index (45 m cell res) 2002 coral taxa



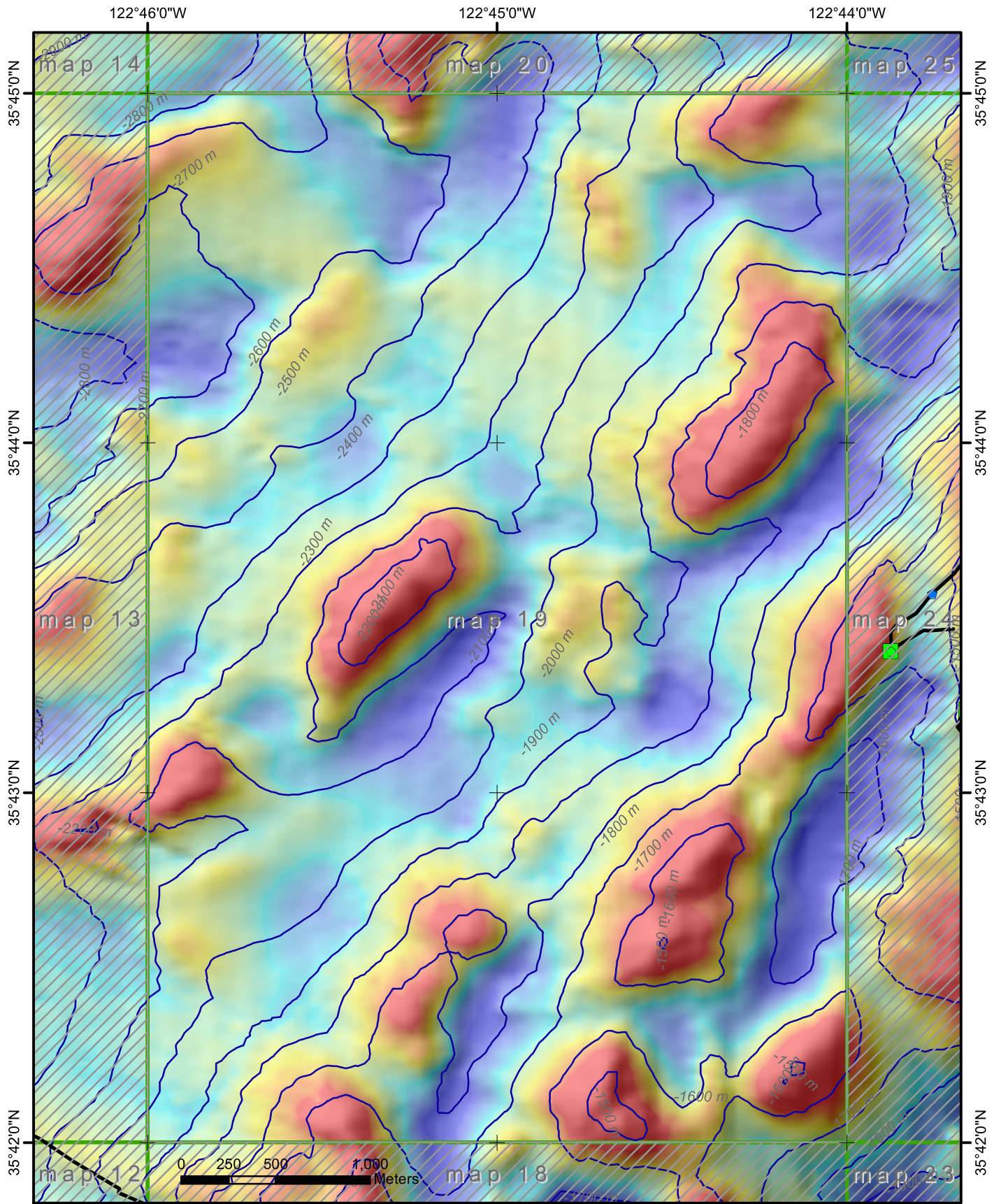
- 2002 Tiburon ROV tracklines
- map index

- | | | |
|----------------------|---------------------------------|-------------------------------|
| Bamboo coral | Gold Gorgonian | Small Yellow Gorgonian |
| Anthipatharian | Leaning Tower of Pisa Gorgonian | Smaller Pink Chunky Gorgonian |
| Anthomastus sp | Orange Bottlebrush Coral | White Gorgonian 1 |
| Big Bonzai Gorgonian | Orange Bushy Gorgonian | White Gorgonian 2 |
| Bushy Gorgonian | Paragorgia sp | White Gorgonian 3 |
| Glassy Gorgonian | Small Pink Gorgonian | |
| | Small Red Gorgonian | |

Map # 18 of 40
1 centimeter equals 280 meters



Chad King - MBNMS - Jan '06



**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res)

Value

High : 196

Low : -130

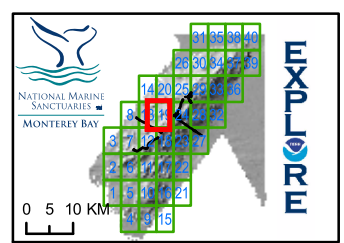
2002 Tiburon ROV tracklines

map index

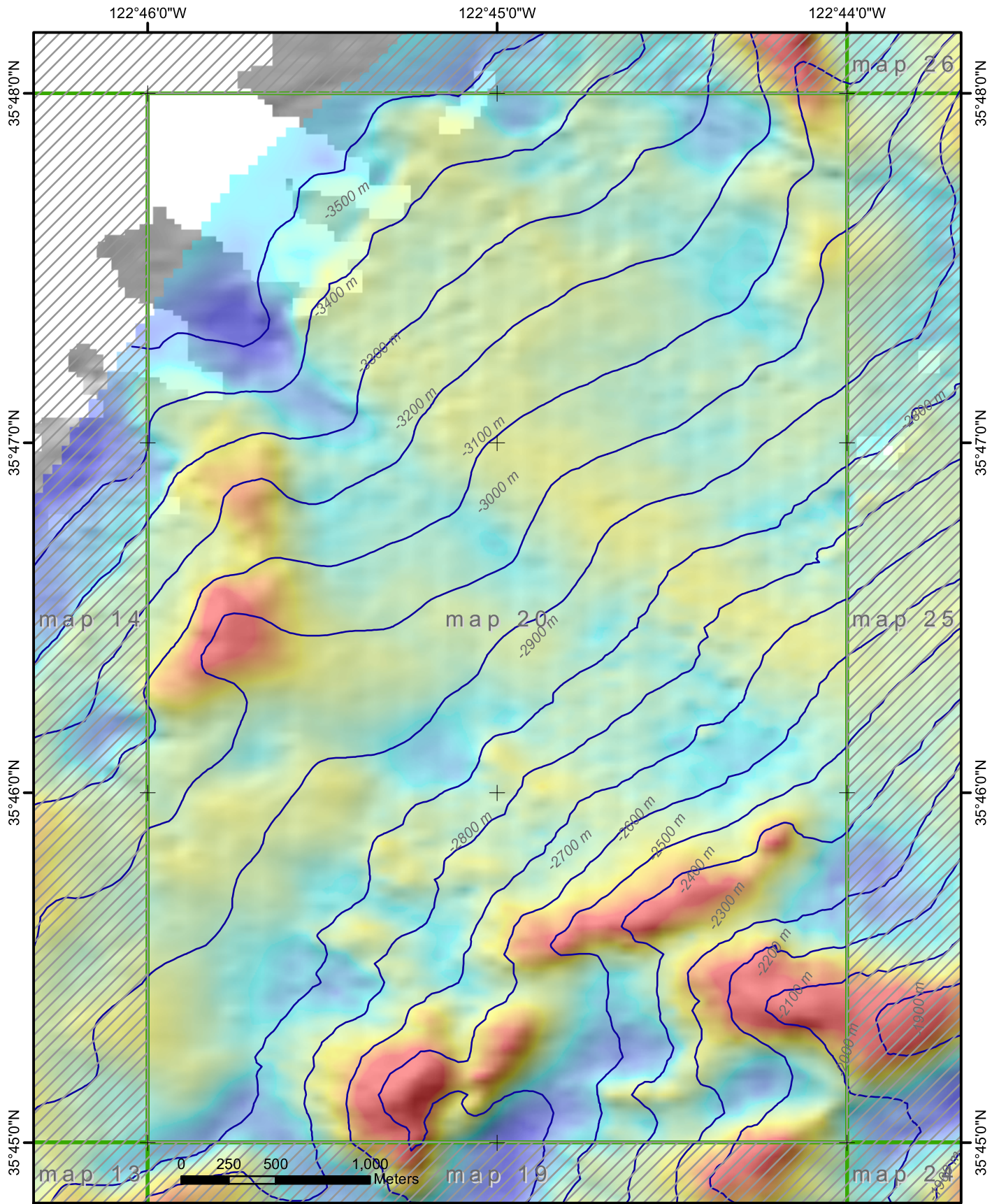


- | | | |
|----------------------|---------------------------------|-------------------------------|
| Bamboo coral | Gold Gorgonian | Small Yellow Gorgonian |
| Anthipatharian | Leaning Tower of Pisa Gorgonian | Smaller Pink Chunky Gorgonian |
| Anthomastus sp | Orange Bottlebrush Coral | White Gorgonian 1 |
| Big Bonzai Gorgonian | Orange Bushy Gorgonian | White Gorgonian 2 |
| Bushy Gorgonian | Paragorgia sp | White Gorgonian 3 |
| Glassy Gorgonian | Small Pink Gorgonian | Small Red Gorgonian |

Map # 19 of 40
1 centimeter equals 280 meters

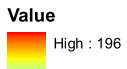


Chad King - MBNMS - Jan '06



**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

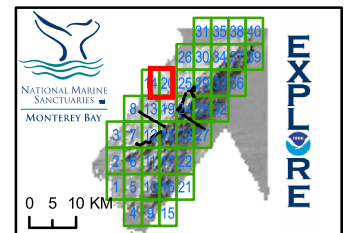
25 cell BPI index (45 m cell res) 2002 coral taxa



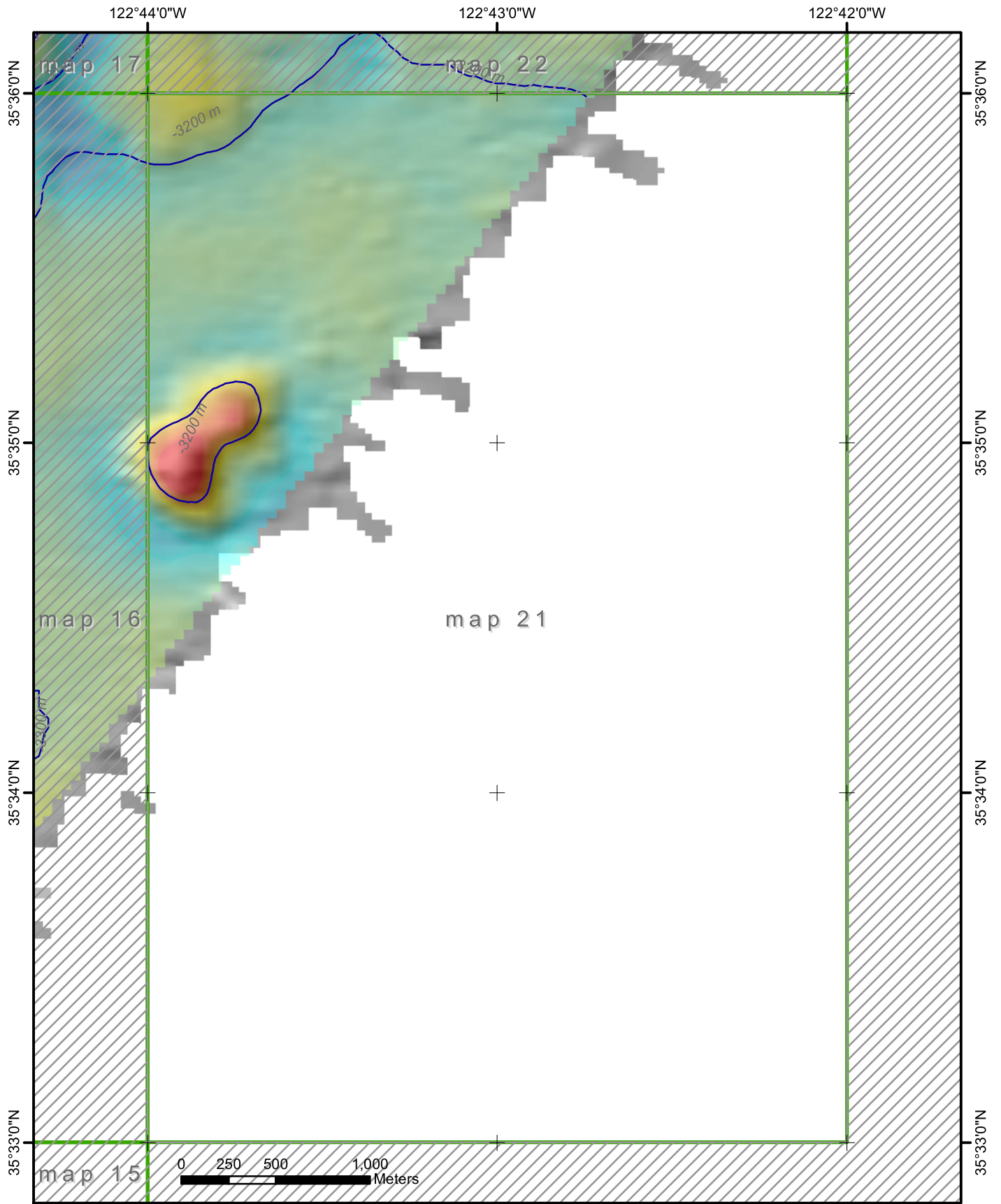
- 2002 Tiburon ROV tracklines
- map index

- | | | |
|----------------------|---------------------------------|-------------------------------|
| Bamboo coral | Gold Gorgonian | Small Yellow Gorgonian |
| Anthipatharian | Leaning Tower of Pisa Gorgonian | Smaller Pink Chunky Gorgonian |
| Anthomastus sp | Orange Bottlebrush Coral | White Gorgonian 1 |
| Big Bonzai Gorgonian | Orange Bushy Gorgonian | White Gorgonian 2 |
| Bushy Gorgonian | Paragorgia sp | White Gorgonian 3 |
| Glassy Gorgonian | Small Pink Gorgonian | |
| | Small Red Gorgonian | |

Map #20 of 40
1 centimeter equals 280 meters



Chad King - MBNMS - Jan '06



**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res)

Value

High : 196
Low : -130

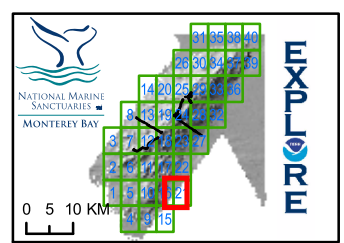
2002 Tiburon ROV tracklines

map index

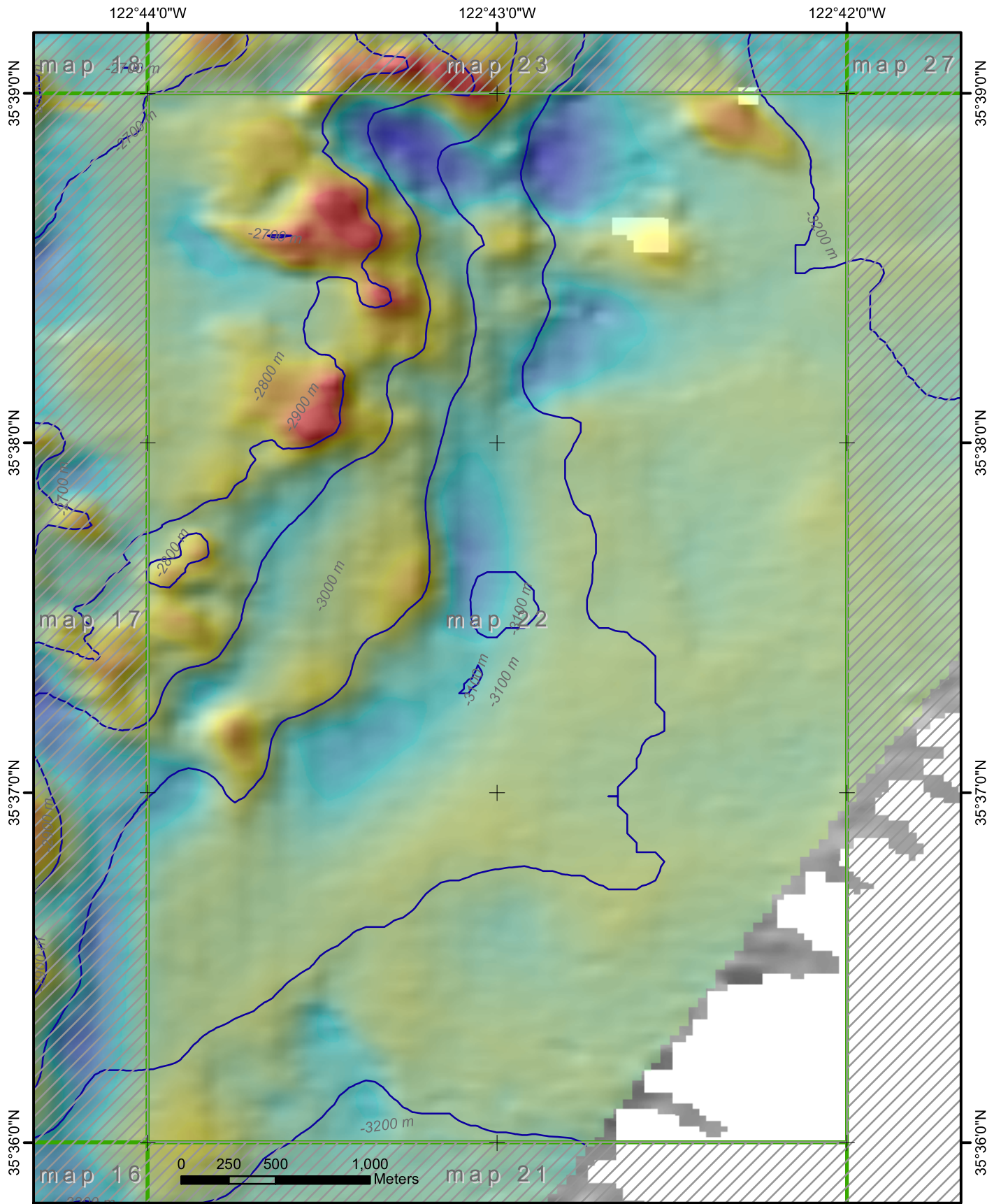


- 2002 coral taxa**
- Bamboo coral
 - Anthipatharian
 - Anthomastus sp
 - Big Bonzai Gorgonian
 - Bushy Gorgonian
 - Glassy Gorgonian
 - Gold Gorgonian
 - Leaning Tower of Pisa Gorgonian
 - Orange Bottlebrush Coral
 - Orange Bushy Gorgonian
 - Paragorgia sp
 - Small Pink Gorgonian
 - Small Red Gorgonian
 - Small Yellow Gorgonian
 - Smaller Pink Chunky Gorgonian
 - White Gorgonian 1
 - White Gorgonian 2
 - White Gorgonian 3

Map #21 of 40
1 centimeter equals 280 meters



Chad King - MBNMS - Jan '06



**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res)

Value

High : 196

Low : -130

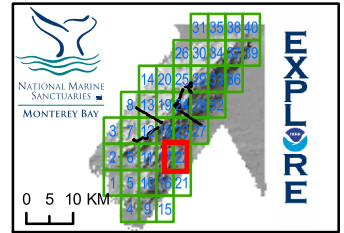
2002 Tiburon ROV tracklines

map index

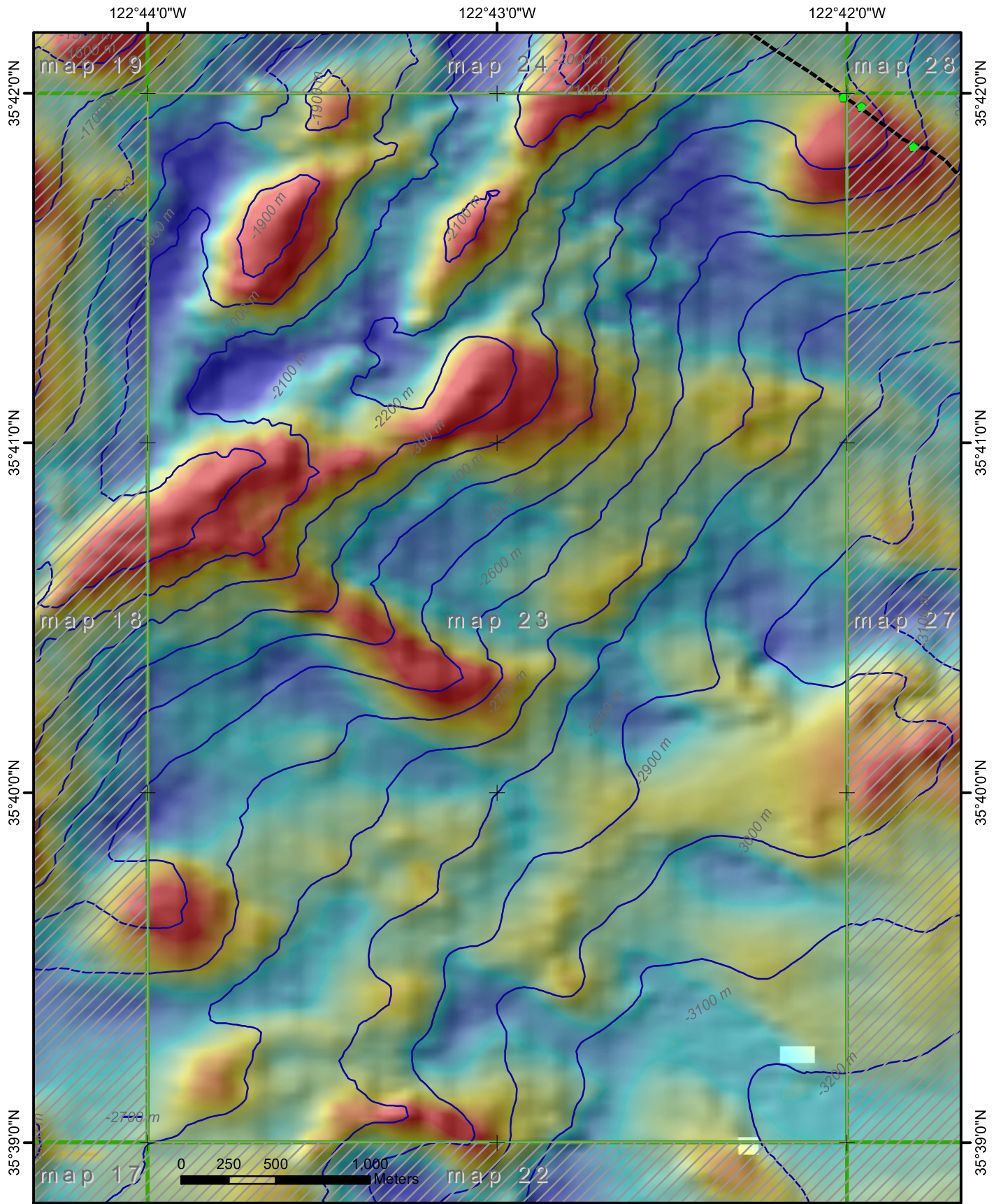


- | | | |
|----------------------|---------------------------------|-------------------------------|
| Bamboo coral | Gold Gorgonian | Small Yellow Gorgonian |
| Anthipatharian | Leaning Tower of Pisa Gorgonian | Smaller Pink Chunky Gorgonian |
| Anthomastus sp | Orange Bottlebrush Coral | White Gorgonian 1 |
| Big Bonzai Gorgonian | Orange Bushy Gorgonian | White Gorgonian 2 |
| Bushy Gorgonian | Paragorgia sp | White Gorgonian 3 |
| Glassy Gorgonian | Small Pink Gorgonian | |
| | Small Red Gorgonian | |

Map #22 of 40
1 centimeter equals 280 meters



Chad King - MBNMS - Jan '06



**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res)

Value

High : 196
Low : -130

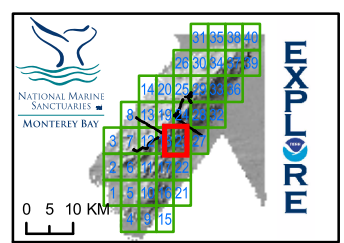
2002 Tiburon ROV tracklines

map index

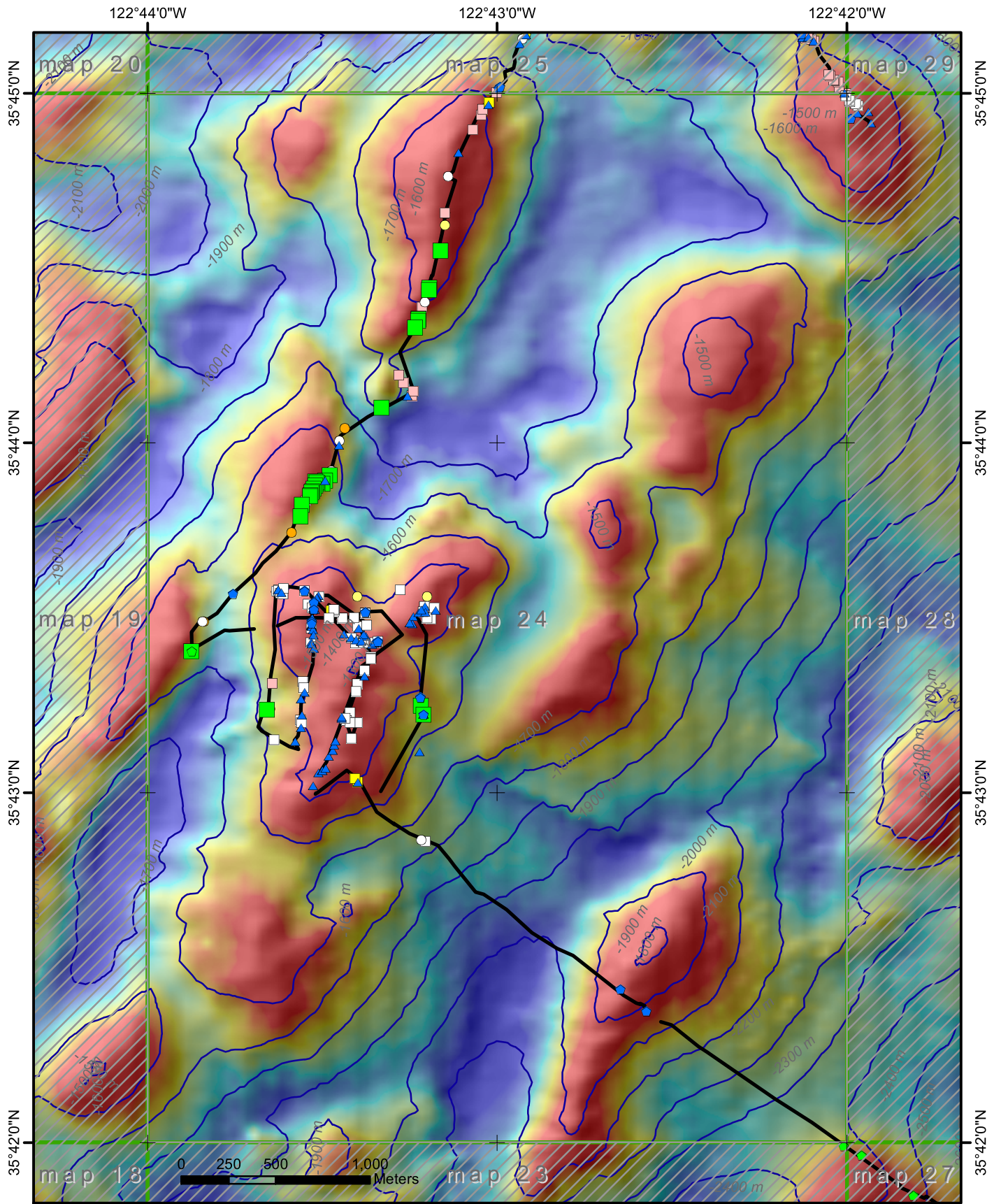


- 2002 coral taxa**
- Bamboo coral
 - Anthipatharian
 - Anthomastus sp
 - Big Bonzai Gorgonian
 - Bushy Gorgonian
 - Glassy Gorgonian
 - Gold Gorgonian
 - Leaning Tower of Pisa Gorgonian
 - Orange Bottlebrush Coral
 - Orange Bushy Gorgonian
 - Paragorgia sp
 - Small Pink Gorgonian
 - Small Red Gorgonian
 - Small Yellow Gorgonian
 - Smaller Pink Chunky Gorgonian
 - White Gorgonian 1
 - White Gorgonian 2
 - White Gorgonian 3

Map #23 of 40
1 centimeter equals 280 meters



Chad King - MBNMS - Jan '06



**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res)

Value

High : 196

Low : -130

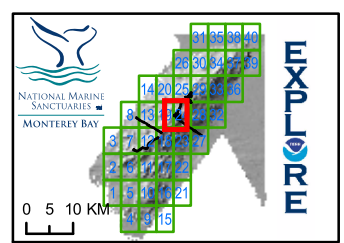
2002 Tiburon ROV tracklines

map index

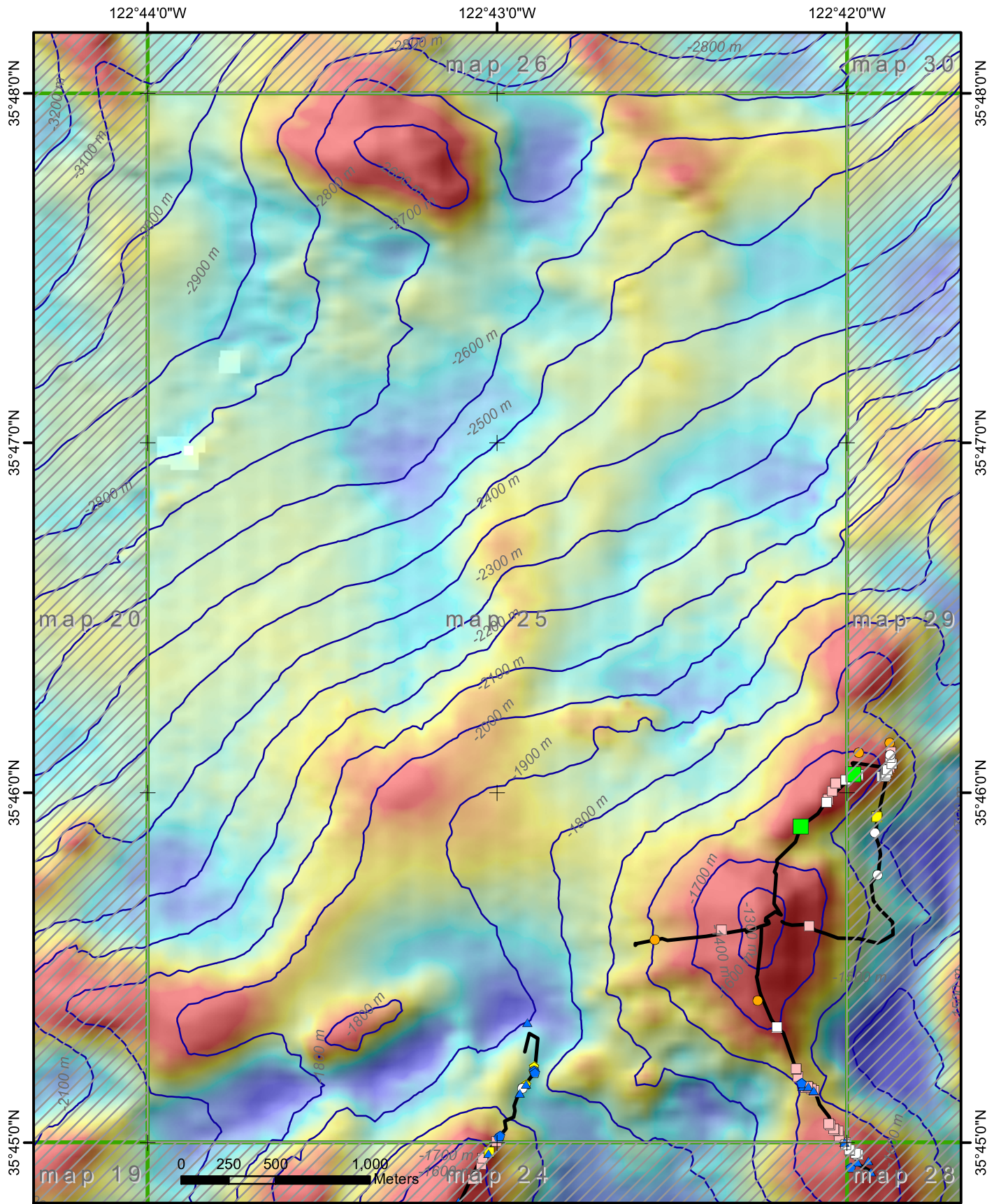


- 2002 coral taxa**
- Bamboo coral
 - ◆ Anthipatharian
 - ◆ Anthomastus sp
 - ◆ Big Bonzai Gorgonian
 - ◆ Bushy Gorgonian
 - Glassy Gorgonian
 - Gold Gorgonian
 - Leaning Tower of Pisa Gorgonian
 - Orange Bottlebrush Coral
 - ▲ Orange Bushy Gorgonian
 - ▲ Paragorgia sp
 - ◆ Small Pink Gorgonian
 - Small Red Gorgonian
 - Small Yellow Gorgonian
 - White Gorgonian 1
 - White Gorgonian 2
 - △ White Gorgonian 3

Map #24 of 40
1 centimeter equals 280 meters



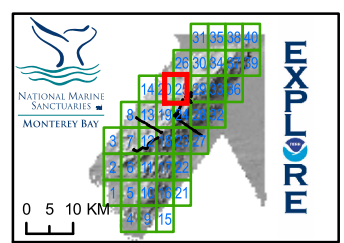
Chad King - MBNMS - Jan '06



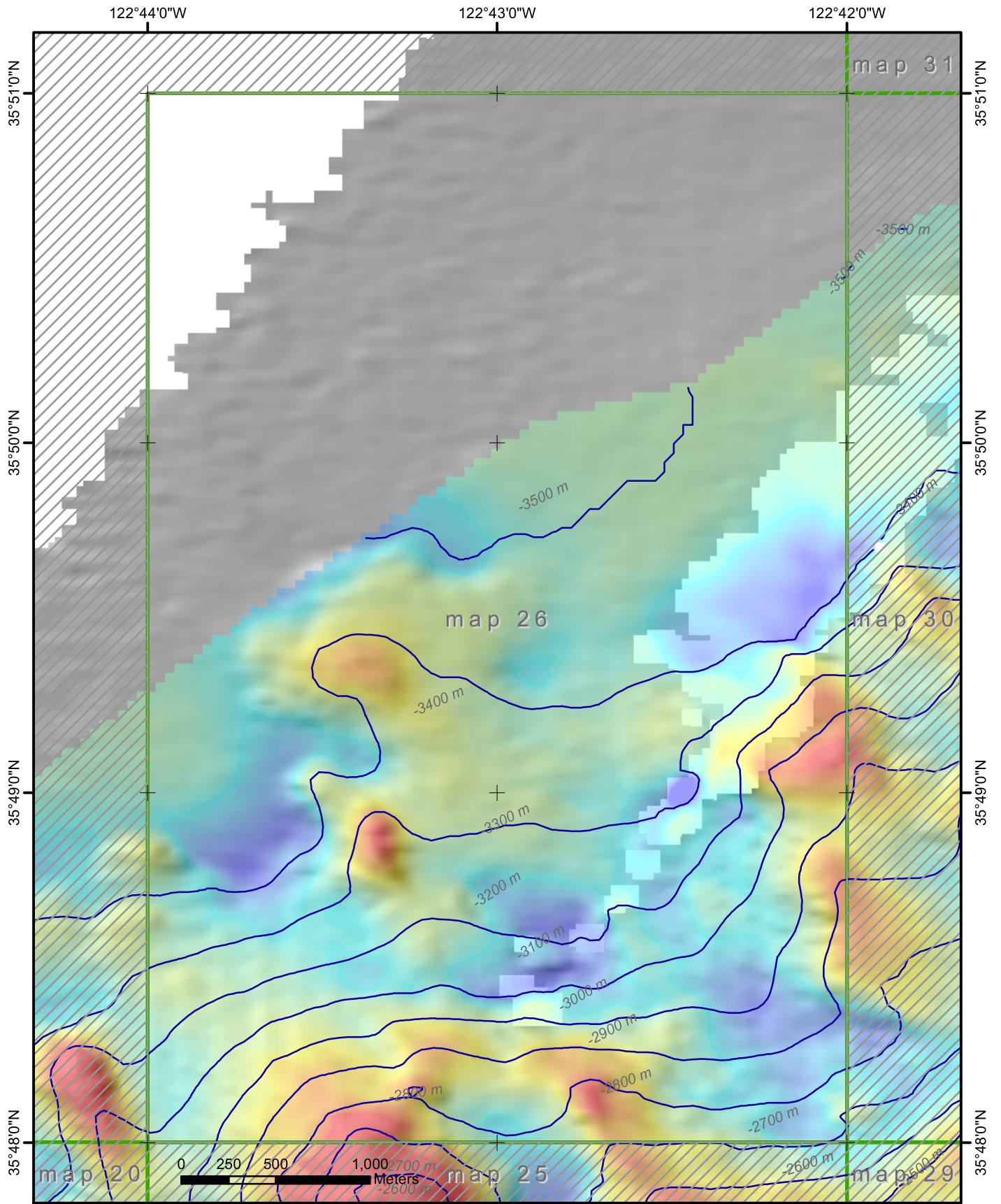
**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

- 25 cell BPI index (45 m cell res)**
- Value**
- High : 196
- Low : -130
- 2002 Tiburon ROV tracklines
- map index
- 2002 coral taxa**
- Bamboo coral
 - Anthipatharian
 - Anthomastus sp
 - Big Bonzai Gorgonian
 - Bushy Gorgonian
 - Glassy Gorgonian
 - Gold Gorgonian
 - Leaning Tower of Pisa Gorgonian
 - Orange Bottlebrush Coral
 - Orange Bushy Gorgonian
 - Paragorgia sp
 - Small Pink Gorgonian
 - Small Red Gorgonian
 - Small Yellow Gorgonian
 - Smaller Pink Chunky Gorgonian
 - White Gorgonian 1
 - White Gorgonian 2
 - White Gorgonian 3

Map #25 of 40
1 centimeter equals 280 meters



Chad King - MBNMS - Jan '06



**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res)

Value

High : 196
Low : -130

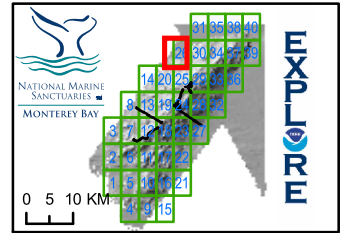
2002 Tiburon ROV tracklines

map index

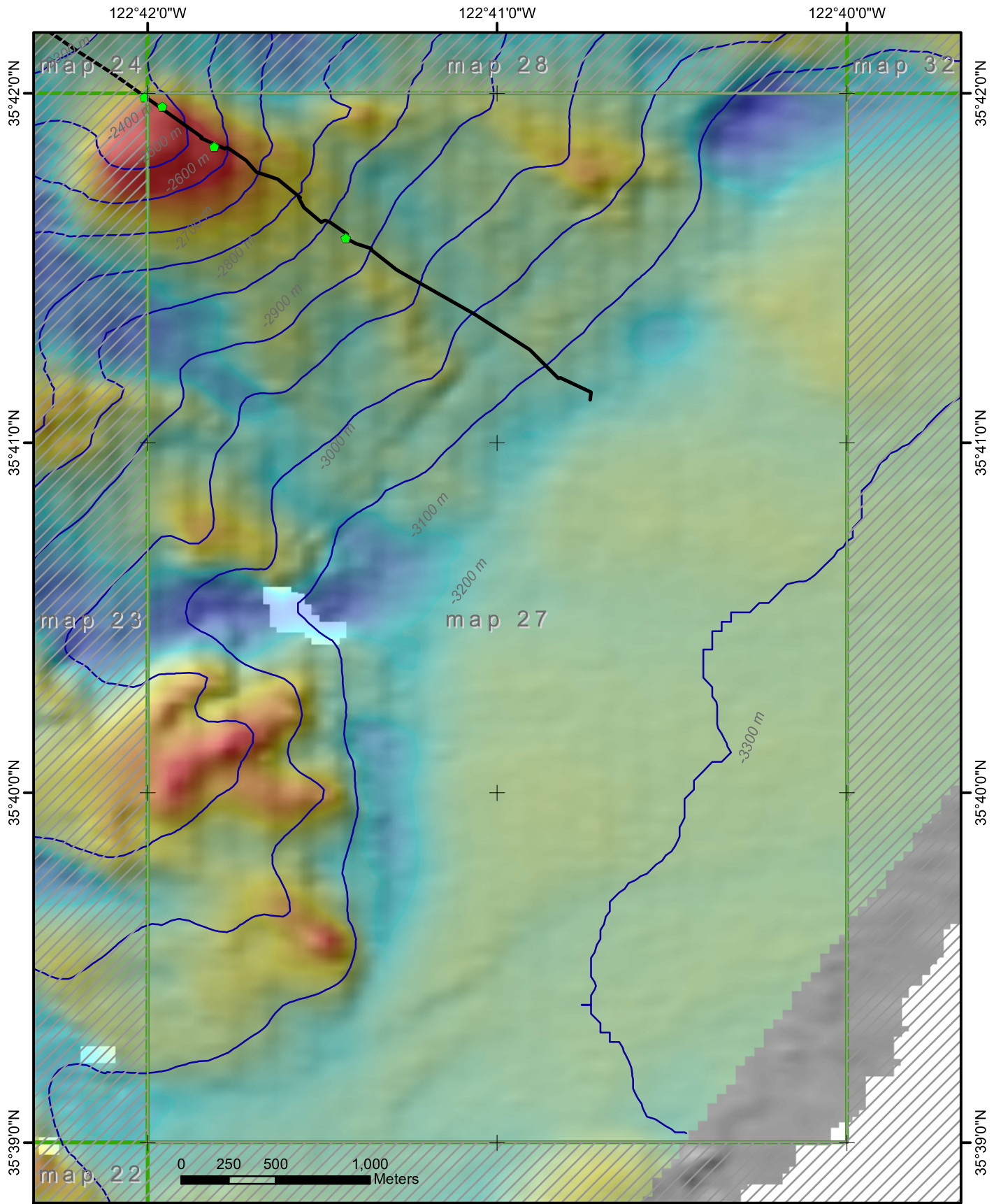


- 2002 coral taxa**
- Bamboo coral
 - Anthipatharian
 - Anthomastus sp
 - Big Bonzai Gorgonian
 - Bushy Gorgonian
 - Glassy Gorgonian
 - Gold Gorgonian
 - Leaning Tower of Pisa Gorgonian
 - Orange Bottlebrush Coral
 - Orange Bushy Gorgonian
 - Paragorgia sp
 - Small Pink Gorgonian
 - Small Red Gorgonian
 - Small Yellow Gorgonian
 - Smaller Pink Chunky Gorgonian
 - White Gorgonian 1
 - White Gorgonian 2
 - White Gorgonian 3

Map #26 of 40
1 centimeter equals 280 meters

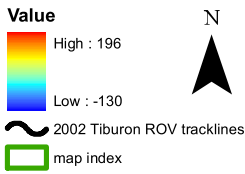


Chad King - MBNMS - Jan '06



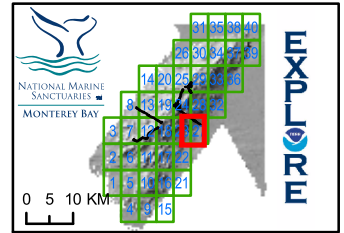
**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res) 2002 coral taxa

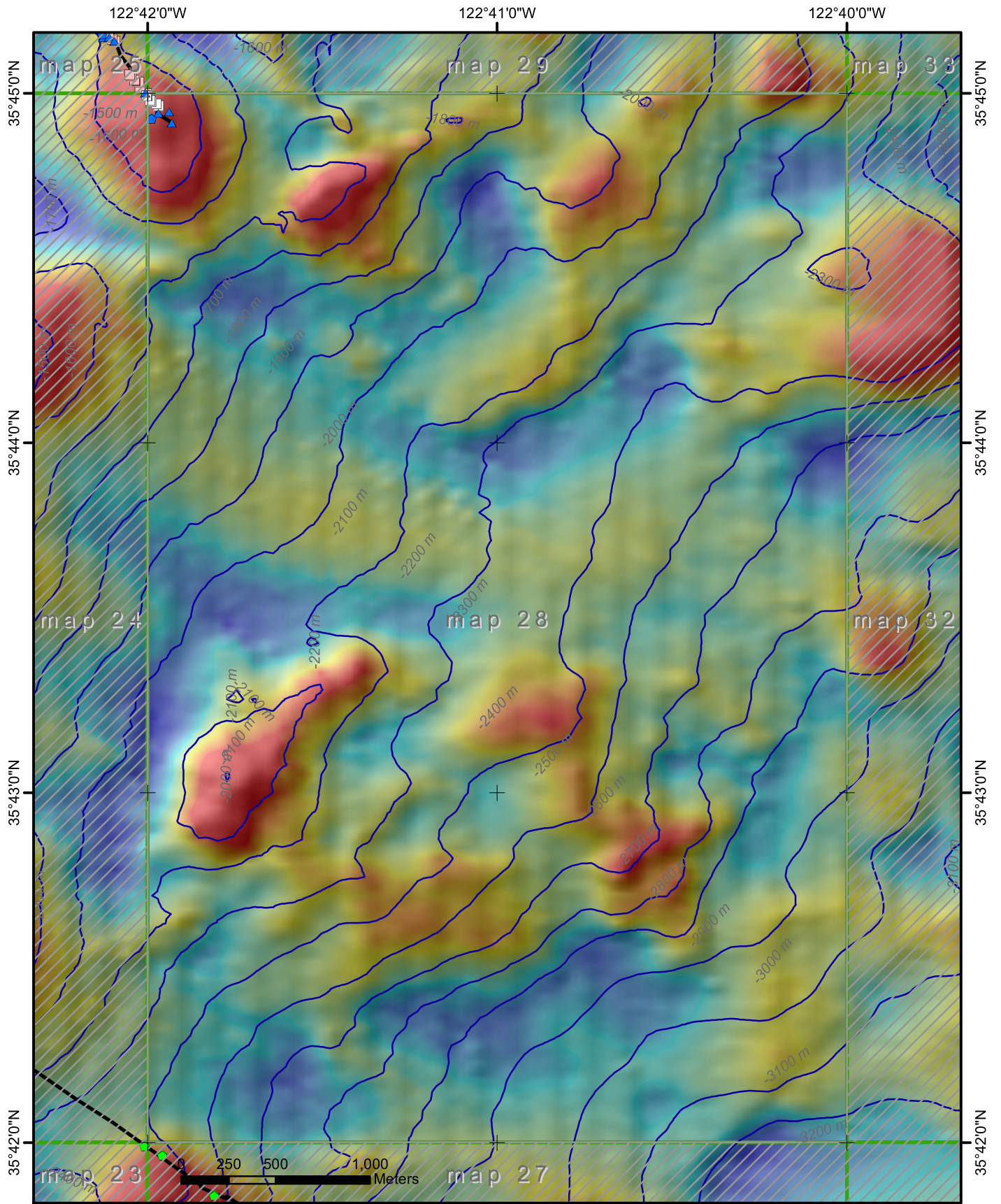


- | | | |
|----------------------|---------------------------------|-------------------------------|
| Bamboo coral | Gold Gorgonian | Small Yellow Gorgonian |
| Anthipatharian | Leaning Tower of Pisa Gorgonian | Smaller Pink Chunky Gorgonian |
| Anthomastus sp | Orange Bottlebrush Coral | White Gorgonian 1 |
| Big Bonzai Gorgonian | Orange Bushy Gorgonian | White Gorgonian 2 |
| Bushy Gorgonian | Paragorgia sp | White Gorgonian 3 |
| Glassy Gorgonian | Small Pink Gorgonian | Small Red Gorgonian |

Map #27 of 40
1 centimeter equals 280 meters



Chad King - MBNMS - Jan '06



**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res) 2002 coral taxa

Value

High : 196
Low : -130

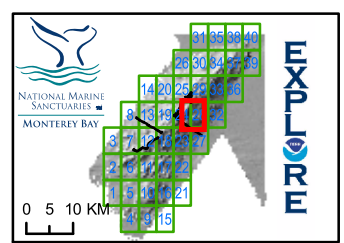
2002 Tiburon ROV tracklines

map index

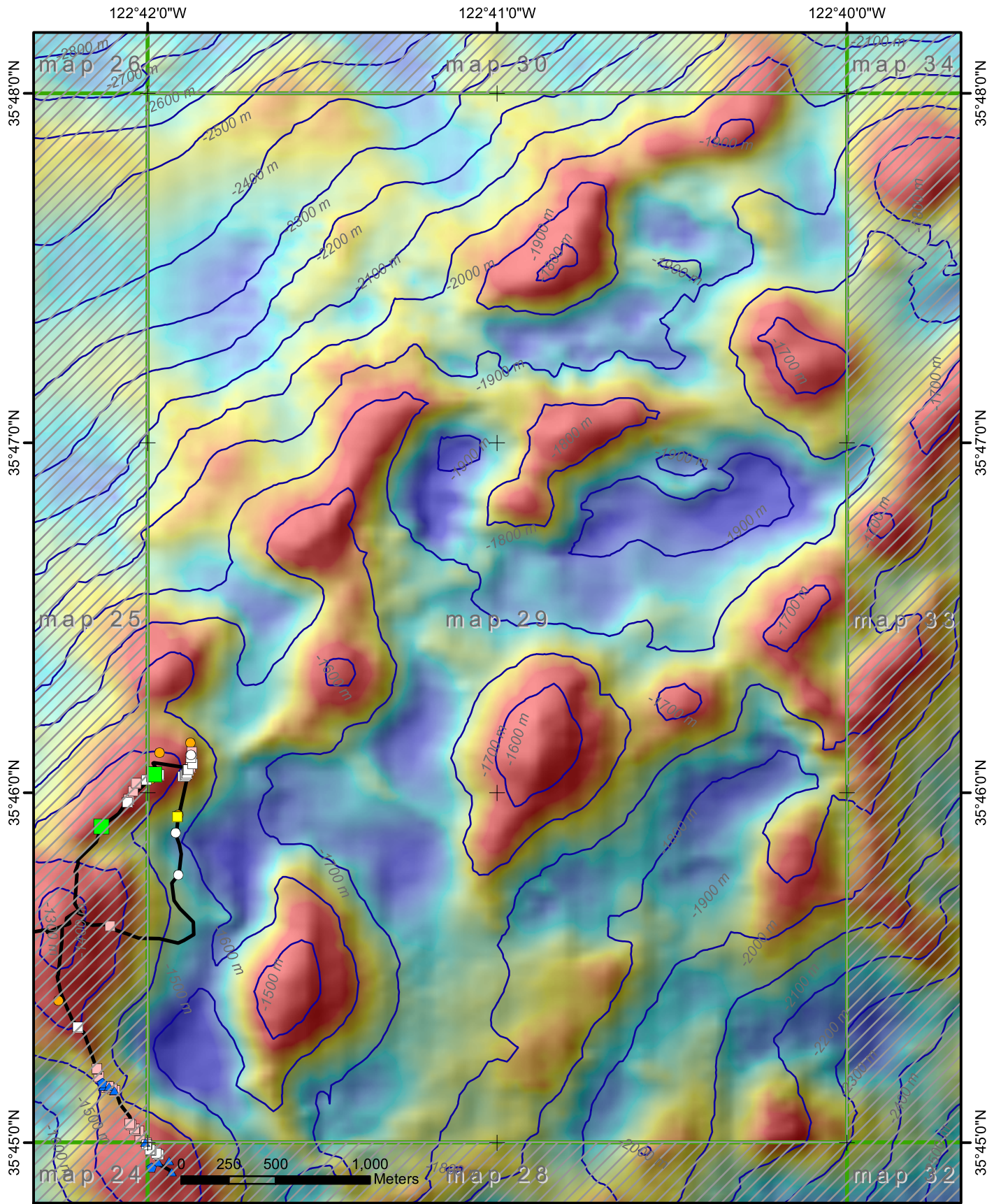
2002 coral taxa

- Bamboo coral
- Anthipatharian
- Anthomastus sp
- Big Bonzai Gorgonian
- Bushy Gorgonian
- Glassy Gorgonian
- Gold Gorgonian
- Leaning Tower of Pisa Gorgonian
- Orange Bottlebrush Coral
- Orange Bushy Gorgonian
- Paragorgia sp
- Small Pink Gorgonian
- Small Red Gorgonian
- Small Yellow Gorgonian
- Smaller Pink Chunky Gorgonian
- White Gorgonian 1
- White Gorgonian 2
- White Gorgonian 3

Map #28 of 40
1 centimeter equals 280 meters



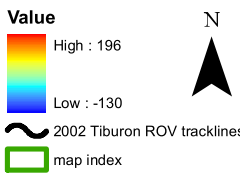
Chad King - MBNMS - Jan '06



2006 Davidson Expedition

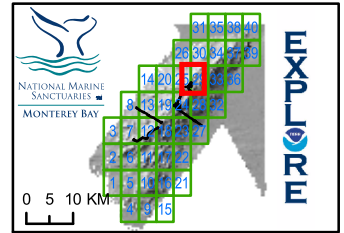
2002 ROV observations and Bathymetric Position Index (BPI) Analysis

25 cell BPI index (45 m cell res) 2002 coral taxa

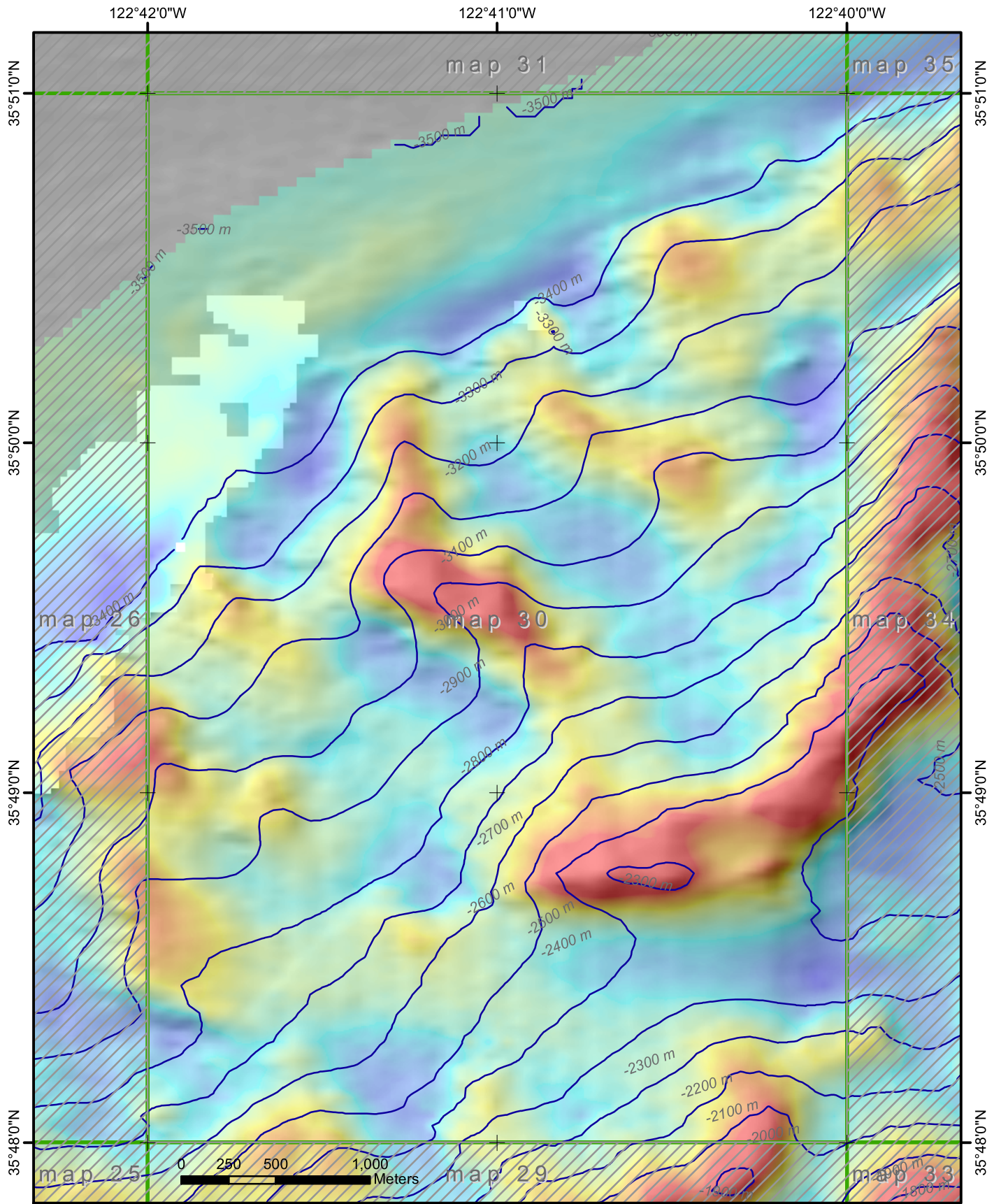


- | | | |
|----------------------|---------------------------------|-------------------------------|
| Bamboo coral | Gold Gorgonian | Small Yellow Gorgonian |
| Anthipatharian | Leaning Tower of Pisa Gorgonian | Smaller Pink Chunky Gorgonian |
| Anthomastus sp | Orange Bottlebrush Coral | White Gorgonian 1 |
| Big Bonzai Gorgonian | Orange Bushy Gorgonian | White Gorgonian 2 |
| Bushy Gorgonian | Paragorgia sp | White Gorgonian 3 |
| Small Pink Gorgonian | Small Red Gorgonian | |
| Glassy Gorgonian | | |

Map #29 of 40
1 centimeter equals 280 meters



Chad King - MBNMS - Jan '06



**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res)

Value

High : 196

Low : -130

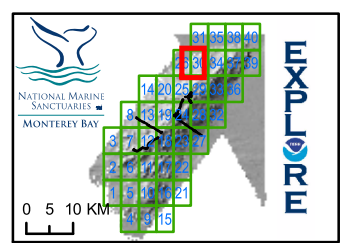
2002 Tiburon ROV tracklines

map index

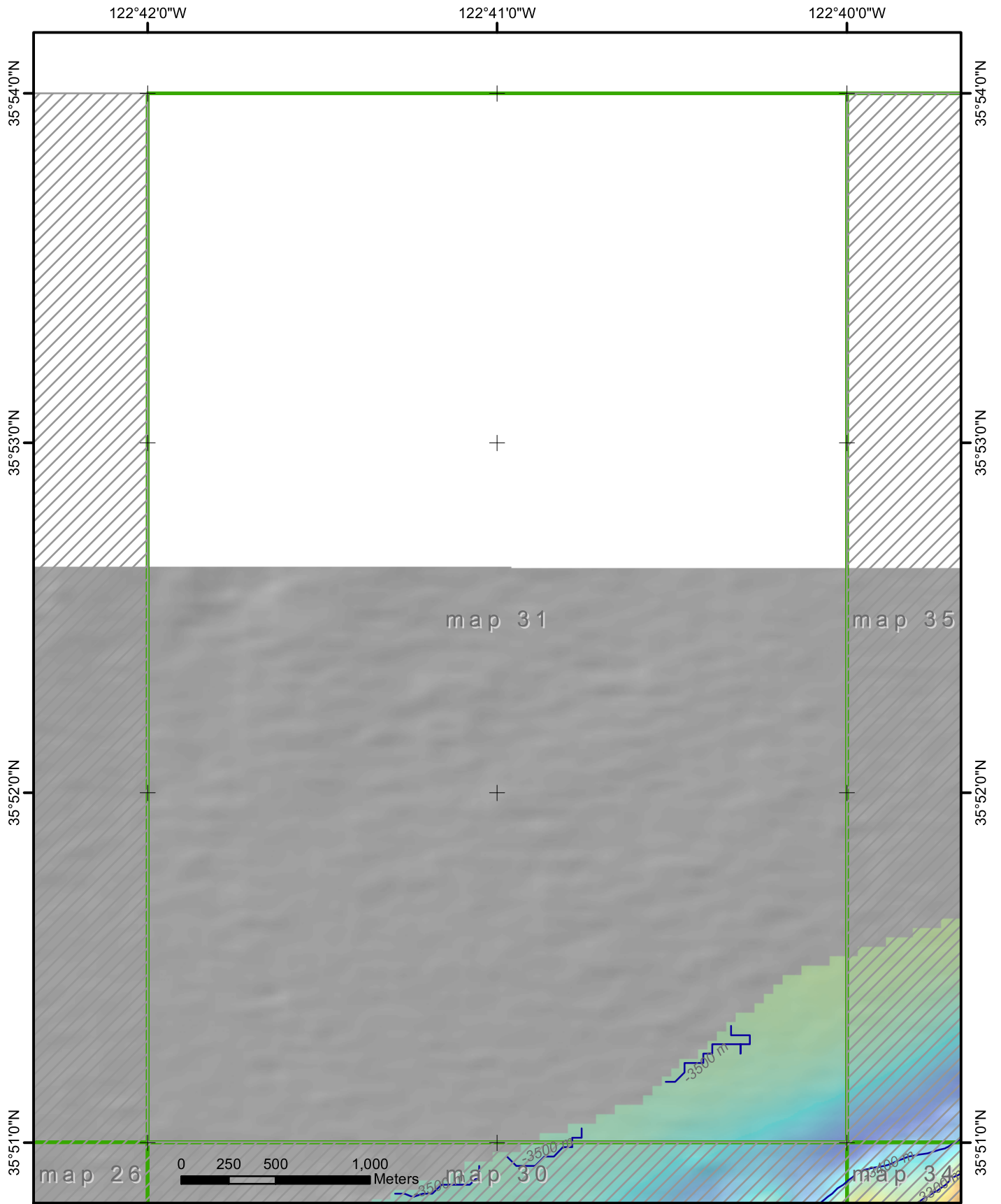


- | | | |
|----------------------|---------------------------------|-------------------------------|
| Bamboo coral | Gold Gorgonian | Small Yellow Gorgonian |
| Anthipatharian | Leaning Tower of Pisa Gorgonian | Smaller Pink Chunky Gorgonian |
| Anthomastus sp | Orange Bottlebrush Coral | White Gorgonian 1 |
| Big Bonzai Gorgonian | Orange Bushy Gorgonian | White Gorgonian 2 |
| Bushy Gorgonian | Paragorgia sp | White Gorgonian 3 |
| Glassy Gorgonian | Small Pink Gorgonian | |
| | Small Red Gorgonian | |

Map #30 of 40
1 centimeter equals 280 meters



Chad King - MBNMS - Jan '06



**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res) 2002 coral taxa

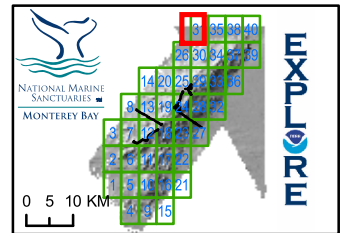
Value
High : 196
Low : -130

- 2002 Tiburon ROV tracklines
- map index

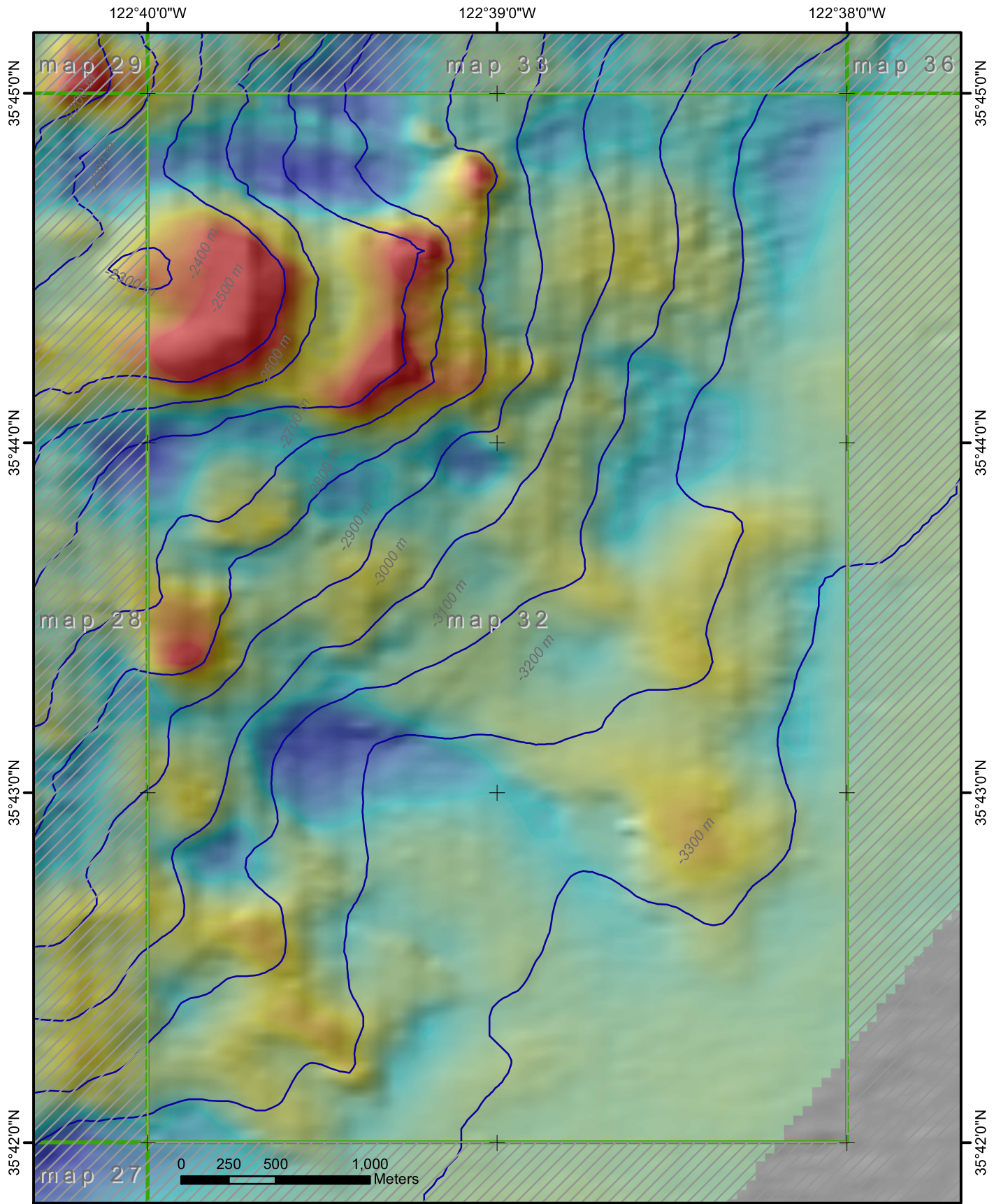


- | | | |
|----------------------|---------------------------------|-------------------------------|
| Bamboo coral | Gold Gorgonian | Small Yellow Gorgonian |
| Anthipatharian | Leaning Tower of Pisa Gorgonian | Smaller Pink Chunky Gorgonian |
| Anthomastus sp | Orange Bottlebrush Coral | White Gorgonian 1 |
| Big Bonzai Gorgonian | Orange Bushy Gorgonian | White Gorgonian 2 |
| Bushy Gorgonian | Paragorgia sp | White Gorgonian 3 |
| Glassy Gorgonian | Small Pink Gorgonian | Small Red Gorgonian |

Map #31 of 40
1 centimeter equals 280 meters



Chad King - MBNMS - Jan '06



**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res) 2002 coral taxa

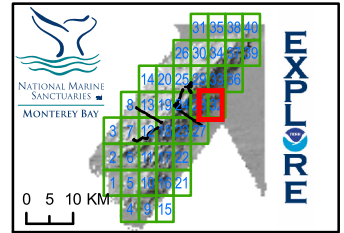
Value
High : 196
Low : -130

2002 Tiburon ROV tracklines
map index

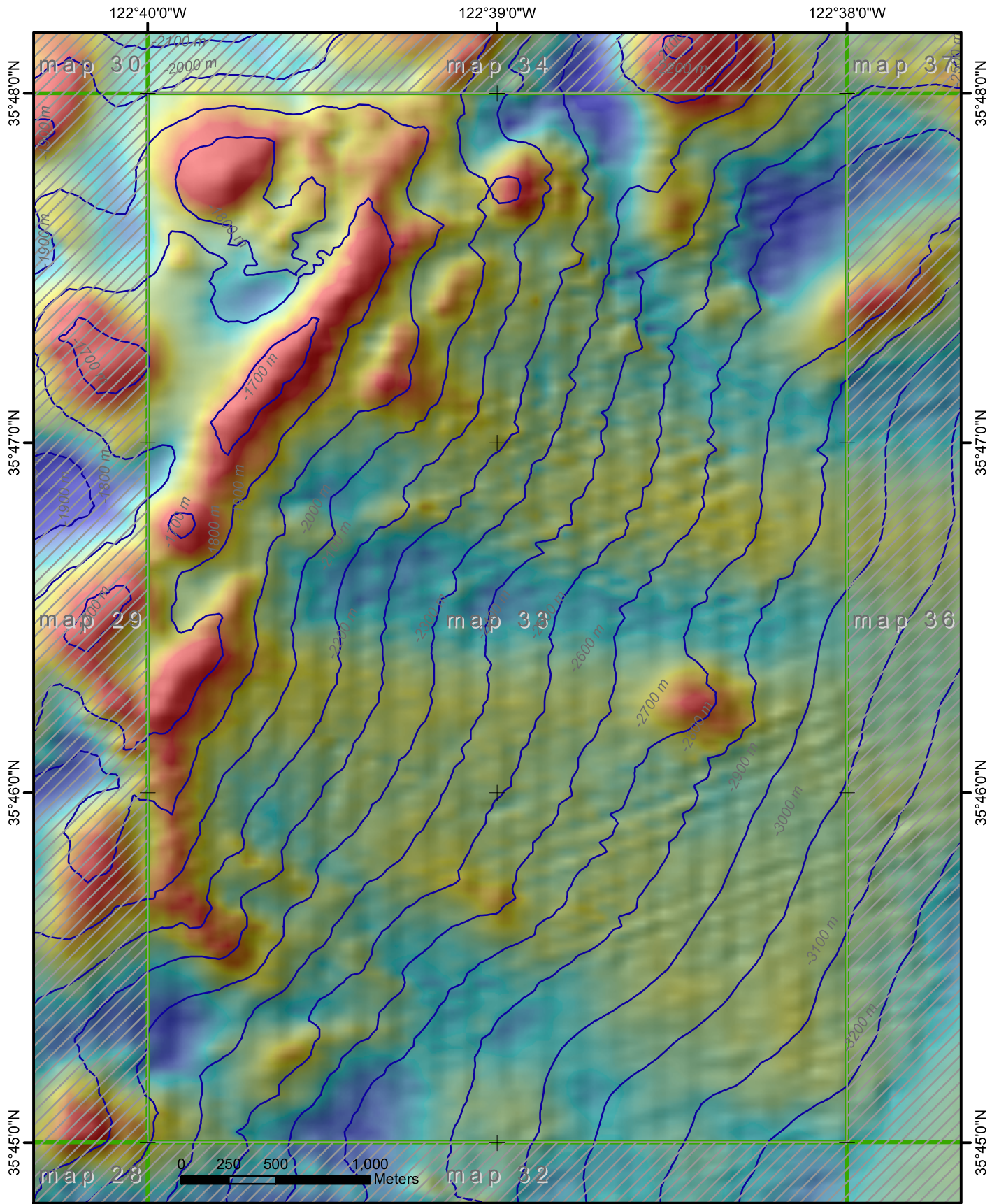


- | | | |
|----------------------|---------------------------------|-------------------------------|
| Bamboo coral | Gold Gorgonian | Small Yellow Gorgonian |
| Anthipatharian | Leaning Tower of Pisa Gorgonian | Smaller Pink Chunky Gorgonian |
| Anthomastus sp | Orange Bottlebrush Coral | White Gorgonian 1 |
| Big Bonzai Gorgonian | Orange Bushy Gorgonian | White Gorgonian 2 |
| Bushy Gorgonian | Paragorgia sp | White Gorgonian 3 |
| Glassy Gorgonian | Small Pink Gorgonian | |
| | Small Red Gorgonian | |

Map #32 of 40
1 centimeter equals 280 meters



Chad King - MBNMS - Jan '06



**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res) 2002 coral taxa

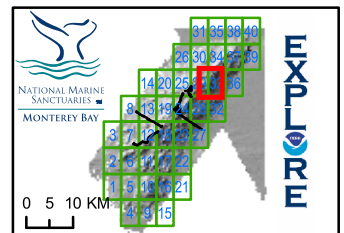
Value
High : 196
Low : -130

- 2002 Tiburon ROV tracklines
- map index

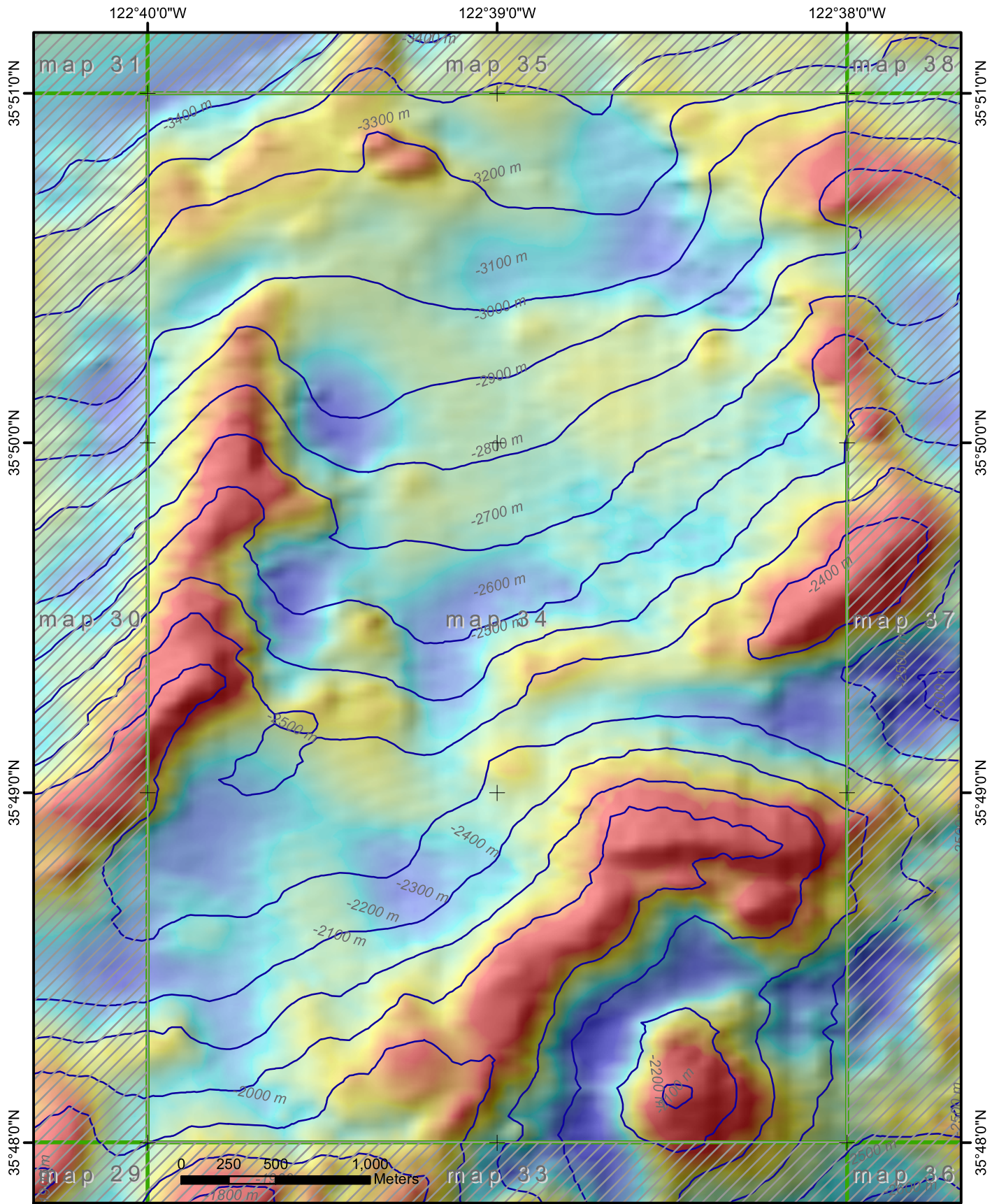


- | | | |
|----------------------|---------------------------------|-------------------------------|
| Bamboo coral | Gold Gorgonian | Small Yellow Gorgonian |
| Anthipatharian | Leaning Tower of Pisa Gorgonian | Smaller Pink Chunky Gorgonian |
| Anthomastus sp | Orange Bottlebrush Coral | White Gorgonian 1 |
| Big Bonzai Gorgonian | Orange Bushy Gorgonian | White Gorgonian 2 |
| Bushy Gorgonian | Paragorgia sp | White Gorgonian 3 |
| Glassy Gorgonian | Small Pink Gorgonian | |
| Small Red Gorgonian | | |

Map #33 of 40
1 centimeter equals 280 meters

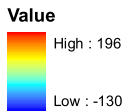


Chad King - MBNMS - Jan '06



**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res) 2002 coral taxa

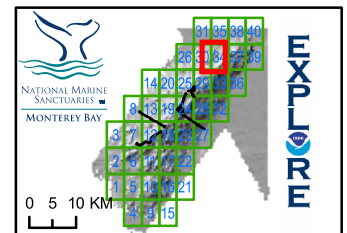


2002 Tiburon ROV tracklines
map index

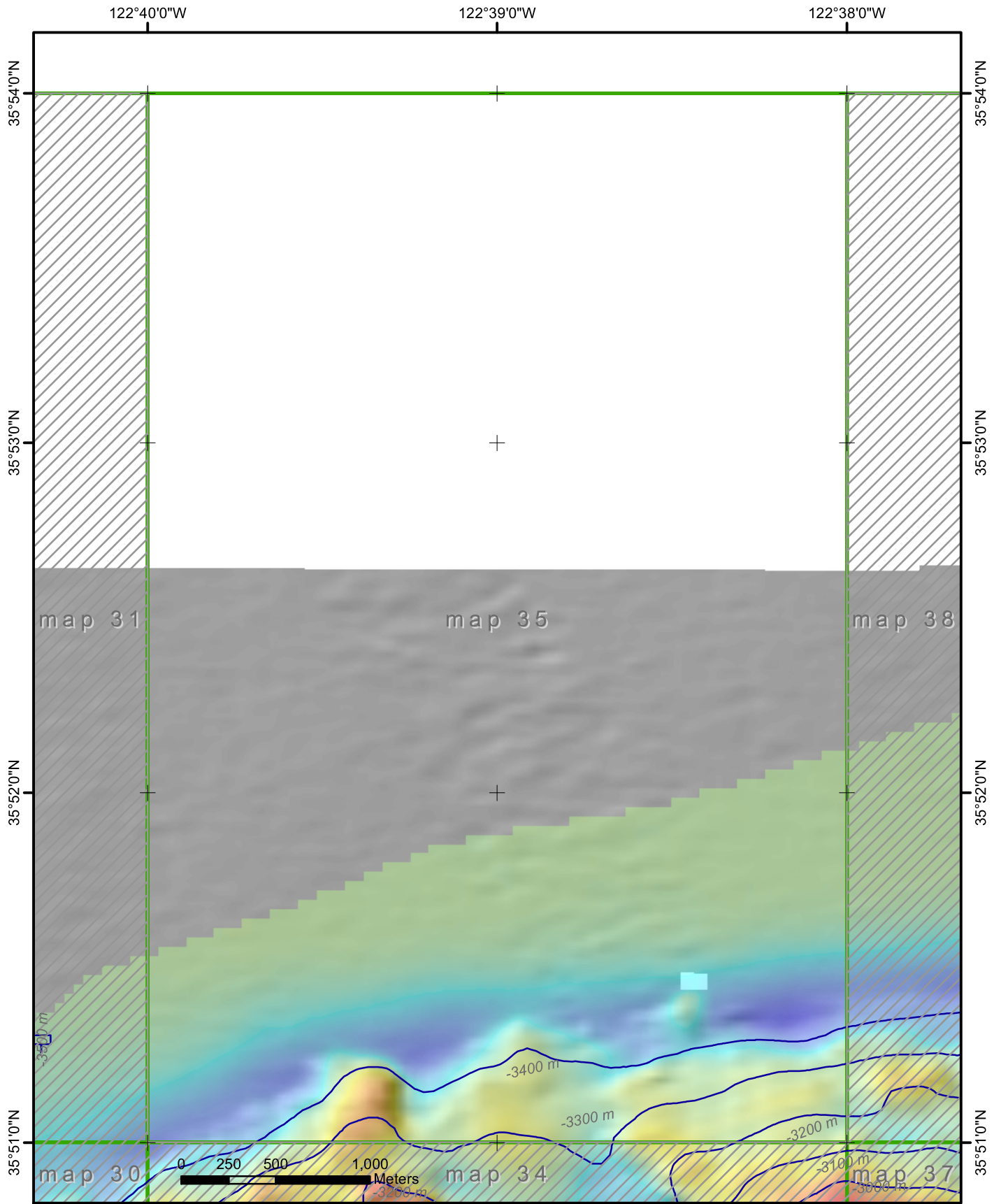


- | | | |
|----------------------|---------------------------------|-------------------------------|
| Bamboo coral | Gold Gorgonian | Small Yellow Gorgonian |
| Anthipatharian | Leaning Tower of Pisa Gorgonian | Smaller Pink Chunky Gorgonian |
| Anthomastus sp | Orange Bottlebrush Coral | White Gorgonian 1 |
| Big Bonzai Gorgonian | Orange Bushy Gorgonian | White Gorgonian 2 |
| Bushy Gorgonian | Paragorgia sp | White Gorgonian 3 |
| Glassy Gorgonian | Small Pink Gorgonian | |
| | Small Red Gorgonian | |

Map #34 of 40
1 centimeter equals 280 meters



Chad King - MBNMS - Jan '06



2006 Davidson Expedition

2002 ROV observations and Bathymetric Position Index (BPI) Analysis

25 cell BPI index (45 m cell res) 2002 coral taxa

Value

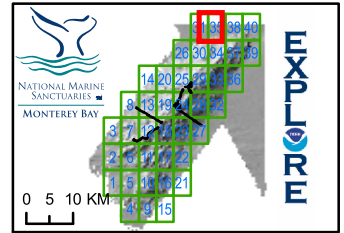
High : 196
 Low : -130



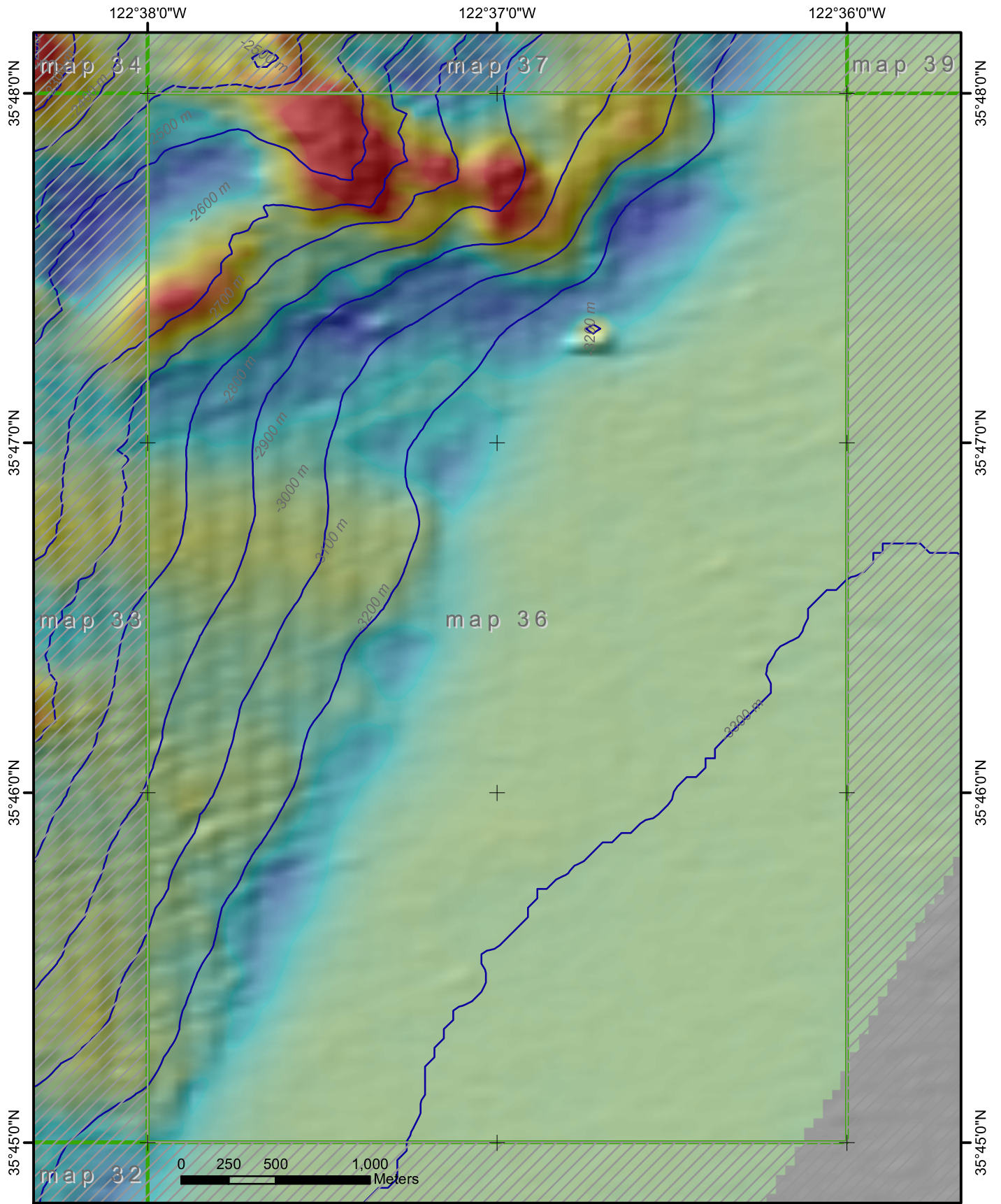
- 2002 Tiburon ROV tracklines
- map index

- | | | |
|----------------------|---------------------------------|-------------------------------|
| Bamboo coral | Gold Gorgonian | Small Yellow Gorgonian |
| Anthipatharian | Leaning Tower of Pisa Gorgonian | Smaller Pink Chunky Gorgonian |
| Anthomastus sp | Orange Bottlebrush Coral | White Gorgonian 1 |
| Big Bonzai Gorgonian | Orange Bushy Gorgonian | White Gorgonian 2 |
| Bushy Gorgonian | Paragorgia sp | White Gorgonian 3 |
| Glassy Gorgonian | Small Pink Gorgonian | |
| | Small Red Gorgonian | |

Map #35 of 40
 1 centimeter equals 280 meters



Chad King - MBNMS - Jan '06



**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res)

Value

High : 196
Low : -130

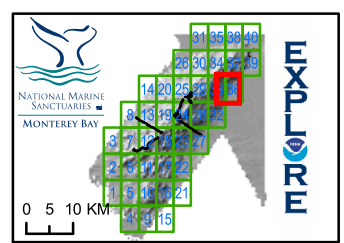
2002 Tiburon ROV tracklines

map index

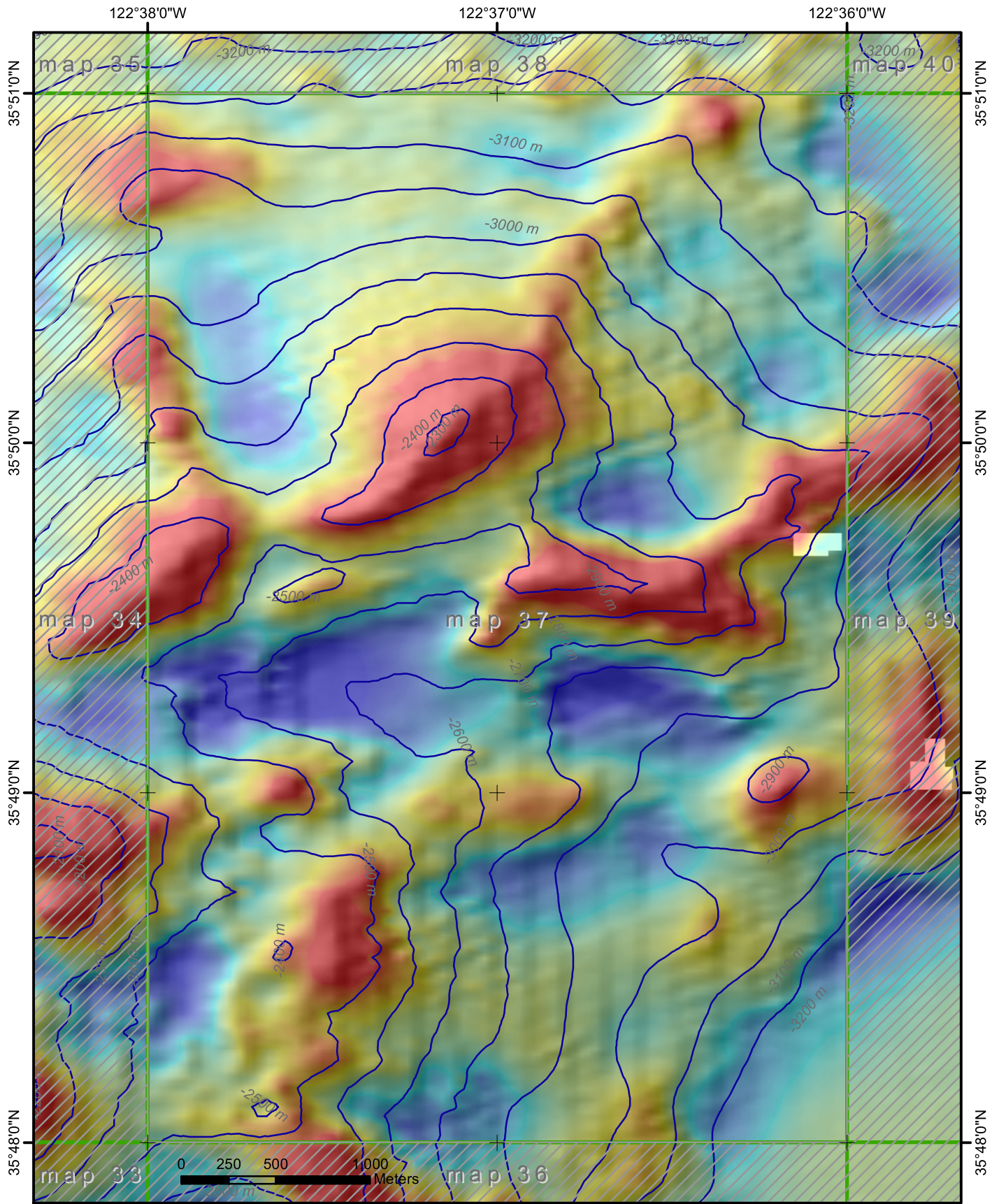


- 2002 coral taxa**
- Bamboo coral
 - Anthipatharian
 - Anthomastus sp
 - Big Bonzai Gorgonian
 - Bushy Gorgonian
 - Glassy Gorgonian
 - Gold Gorgonian
 - Leaning Tower of Pisa Gorgonian
 - Orange Bottlebrush Coral
 - Orange Bushy Gorgonian
 - Paragorgia sp
 - Small Pink Gorgonian
 - Small Red Gorgonian
 - Small Yellow Gorgonian
 - Smaller Pink Chunky Gorgonian
 - White Gorgonian 1
 - White Gorgonian 2
 - White Gorgonian 3

Map #36 of 40
1 centimeter equals 280 meters

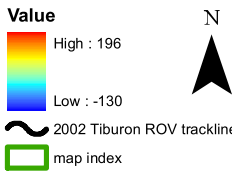


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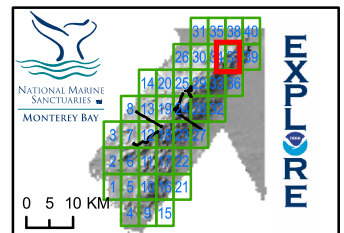
**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res) 2002 coral taxa

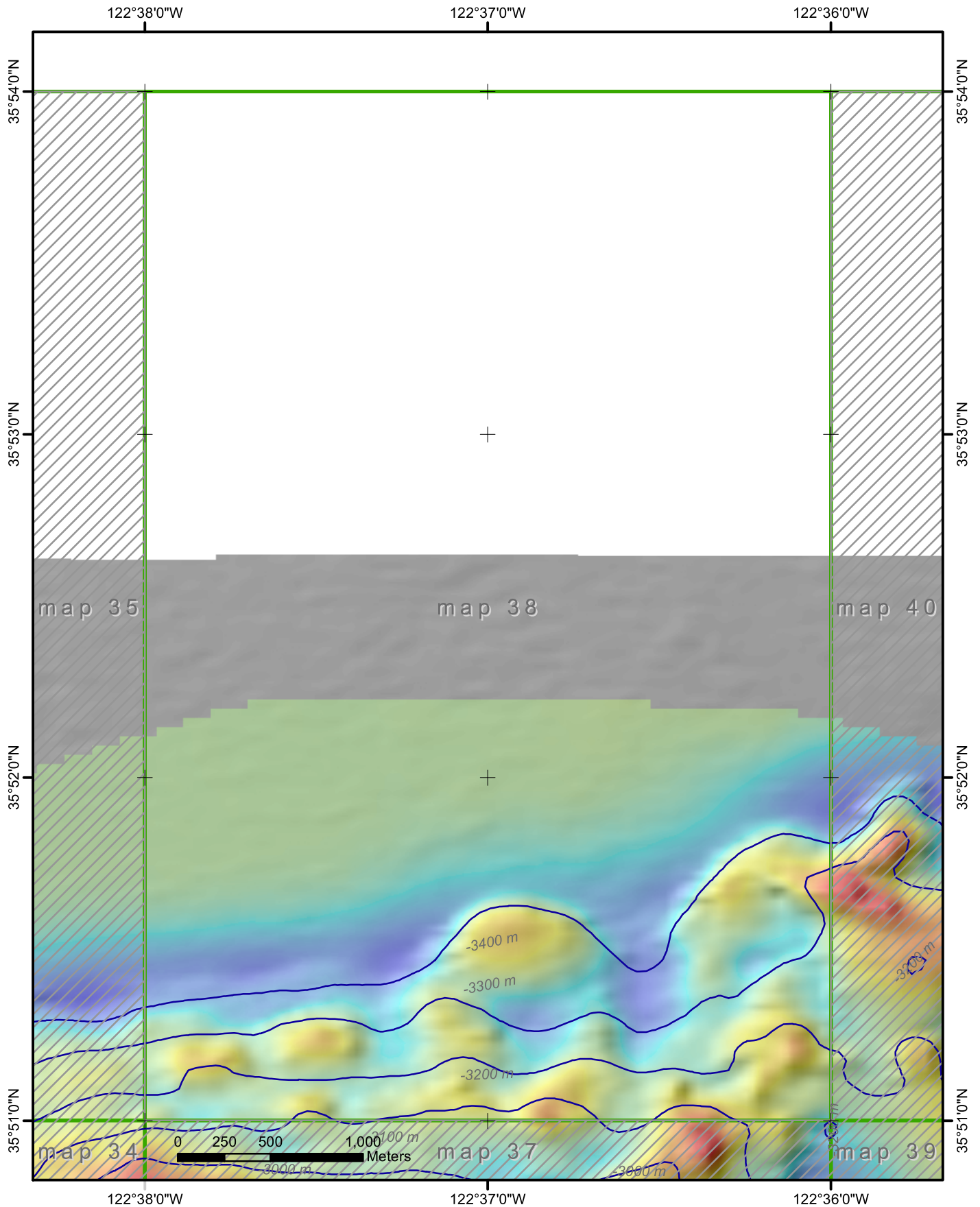


- Bamboo coral
- ◆ Anthipatharian
- ◆ Anthomastus sp
- ◆ Big Bonzai Gorgonian
- ◆ Bushy Gorgonian
- Glassy Gorgonian
- Gold Gorgonian
- Leaning Tower of Pisa Gorgonian
- Orange Bottlebrush Coral
- ▲ Orange Bushy Gorgonian
- ▲ Paragorgia sp
- Small Pink Gorgonian
- Small Red Gorgonian
- Small Yellow Gorgonian
- Smaller Pink Chunky Gorgonian
- White Gorgonian 1
- White Gorgonian 2
- White Gorgonian 3

Map #37 of 40
1 centimeter equals 280 meters



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**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

25 cell BPI index (45 m cell res)

Value

High : 196
Low : -130

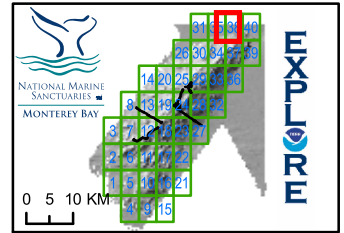
2002 Tiburon ROV tracklines

map index

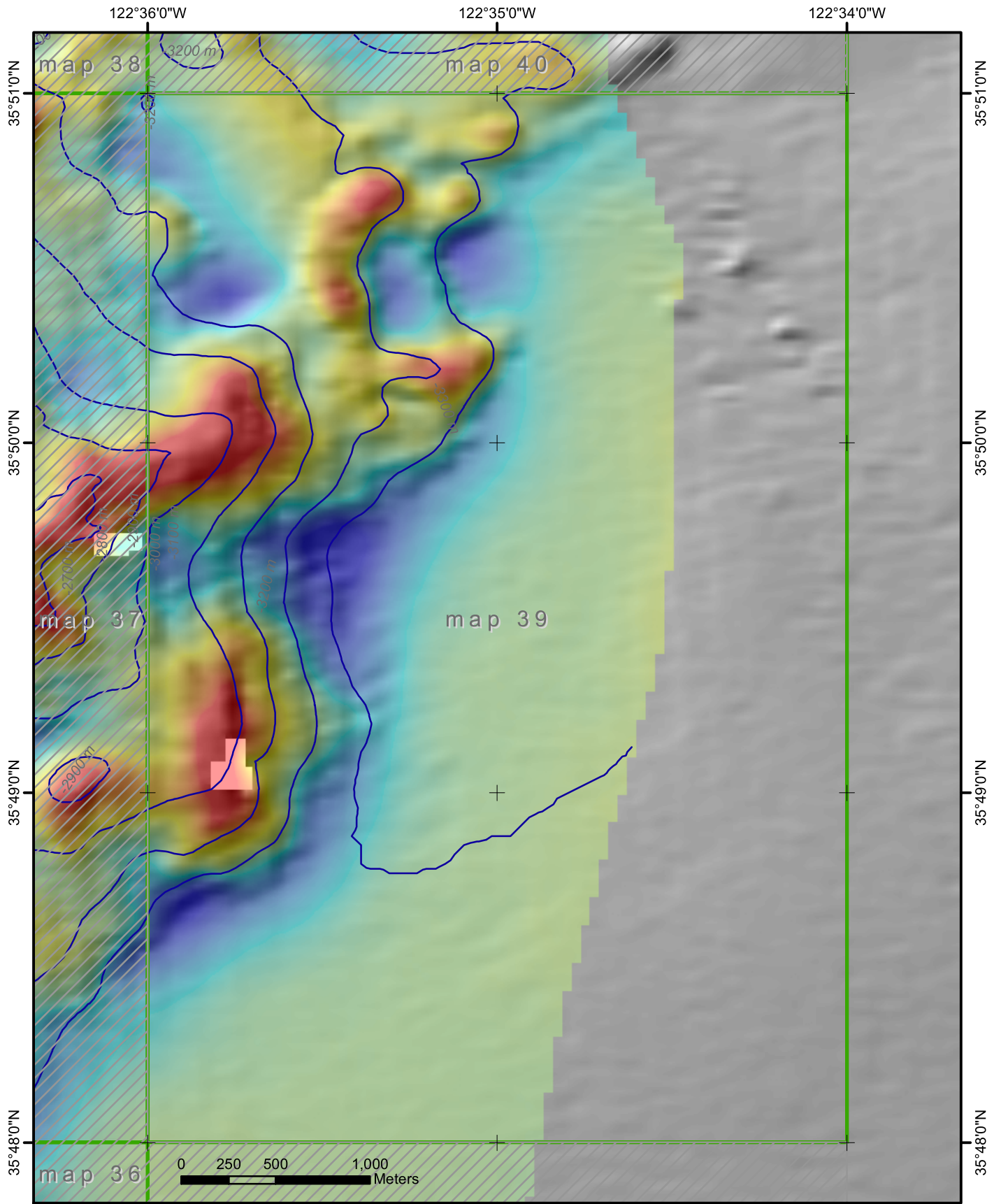


- 2002 coral taxa**
- Bamboo coral
 - Anthipatharian
 - Anthomastus sp
 - Big Bonzai Gorgonian
 - Bushy Gorgonian
 - Glassy Gorgonian
 - Gold Gorgonian
 - Leaning Tower of Pisa Gorgonian
 - Orange Bottlebrush Coral
 - Orange Bushy Gorgonian
 - Paragorgia sp
 - Small Pink Gorgonian
 - Small Red Gorgonian
 - Small Yellow Gorgonian
 - Smaller Pink Chunky Gorgonian
 - White Gorgonian 1
 - White Gorgonian 2
 - White Gorgonian 3

Map #38 of 40
1 centimeter equals 280 meters



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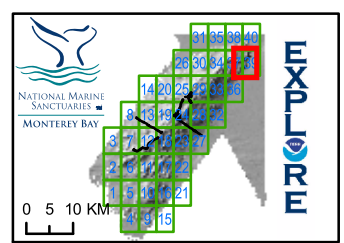
**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

- 25 cell BPI index (45 m cell res)**
- Value**
- High : 196
- Low : -130
- 2002 Tiburon ROV tracklines
- map index

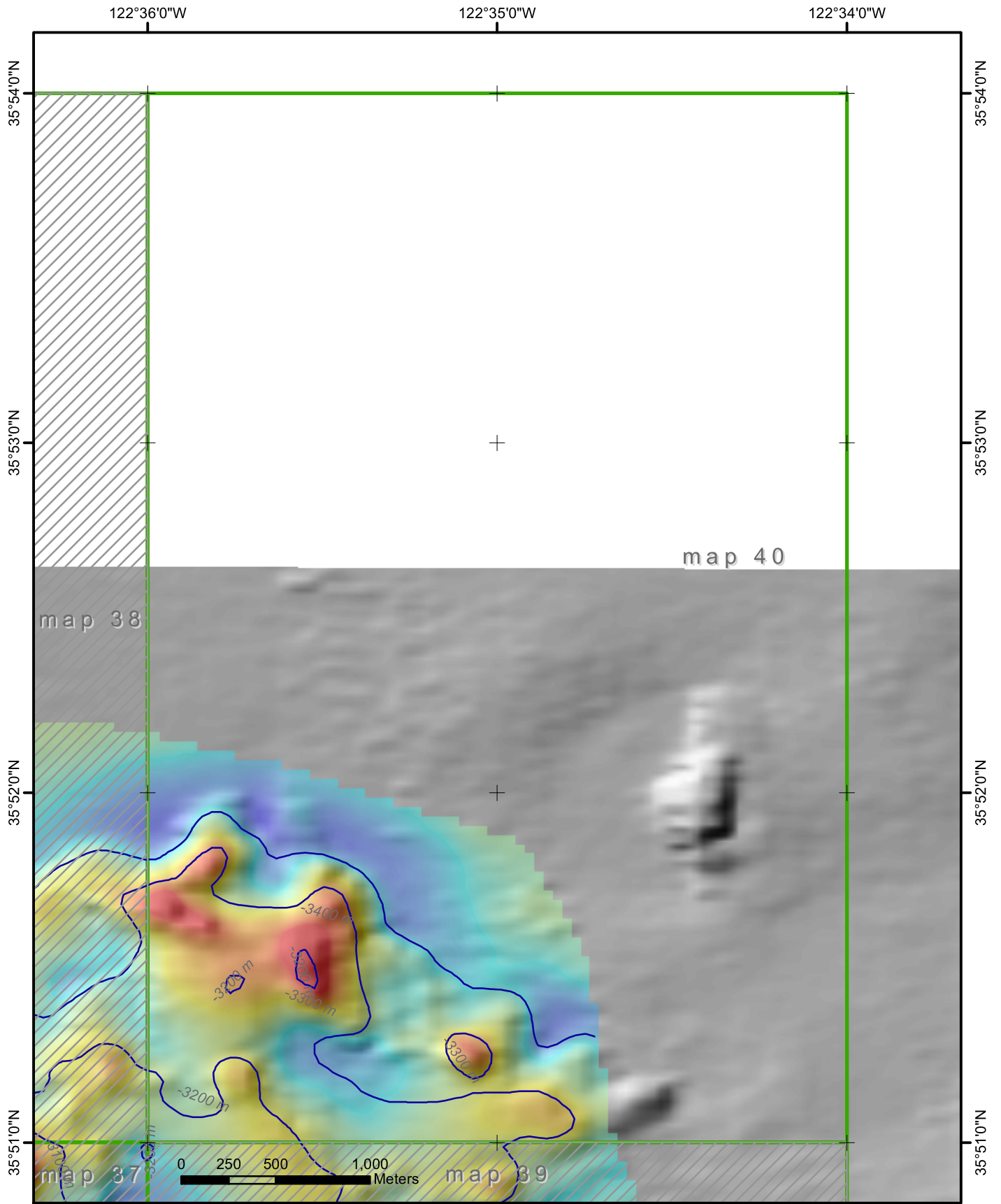


- 2002 coral taxa**
- Bamboo coral
 - ◆ Anthipatharian
 - ◆ Anthomastus sp
 - ◆ Big Bonzai Gorgonian
 - ◆ Bushy Gorgonian
 - Glassy Gorgonian
 - Gold Gorgonian
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 - ▲ Paragorgia sp
 - Small Pink Gorgonian
 - Small Red Gorgonian
 - Small Yellow Gorgonian
 - Smaller Pink Chunky Gorgonian
 - White Gorgonian 1
 - White Gorgonian 2
 - White Gorgonian 3

Map #39 of 40
1 centimeter equals 280 meters

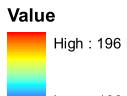


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**2006 Davidson Expedition
2002 ROV observations and Bathymetric Position Index (BPI) Analysis**

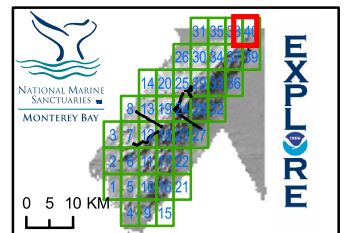
25 cell BPI index (45 m cell res) 2002 coral taxa



- 2002 Tiburon ROV tracklines
- map index

- | | | |
|----------------------|---------------------------------|-------------------------------|
| Bamboo coral | Gold Gorgonian | Small Yellow Gorgonian |
| Anthipatharian | Leaning Tower of Pisa Gorgonian | Smaller Pink Chunky Gorgonian |
| Anthomastus sp | Orange Bottlebrush Coral | White Gorgonian 1 |
| Big Bonzai Gorgonian | Orange Bushy Gorgonian | White Gorgonian 2 |
| Bushy Gorgonian | Paragorgia sp | White Gorgonian 3 |
| Glassy Gorgonian | Small Pink Gorgonian | Small Red Gorgonian |

Map #40 of 40
1 centimeter equals 280 meters



Bathymetric Position Index (BPI)

The concept of bathymetric position is central to the benthic terrain classification process that is utilized by the BTM. Bathymetric Position Index (BPI) is a measure of where a referenced location is relative to the locations surrounding it. BPI is derived from an input bathymetric data set and itself is a modification of the topographic position index (TPI) algorithm that is used in the terrestrial environment. The application of TPI to develop terrain classifications was explored and developed by Andrew Weiss during his study of terrestrial watersheds in Central Oregon (Weiss 2001). These applications can be carried into the benthic environment through BPI.

Bathymetric Position Index (BPI) data sets are created through a neighborhood analysis function. Positive cell values within a BPI data set denote features and regions that are higher than the surrounding area. Therefore, areas of positive values generally characterize ridges and other associated features within the benthic terrain. Likewise, negative cell values within a BPI data set denote features and regions that are lower than the surrounding area. Areas of negative cell values generally characterize valleys and other associated features within a bathymetric data set (Figure 1). BPI values near zero are either flat areas (where the slope is near zero) or areas of constant slope (where the slope of the point is significantly greater than zero) (Figure 2) (Weiss 2001).

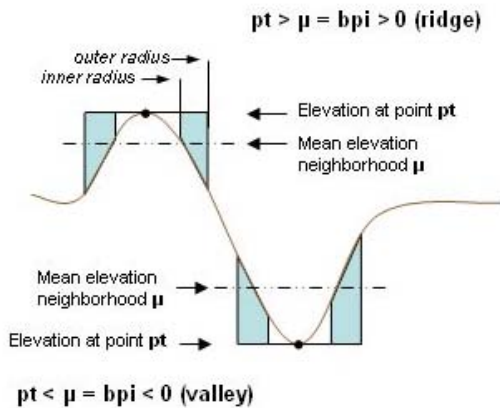


Figure 1 - Positive and negative BPI value derivation for ridges and valleys

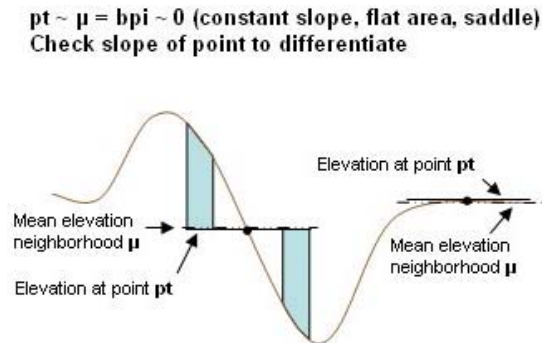


Figure 2 - Areas where the BPI value is near or equal to zero. The slope of the terrain at the given point is used to determine the bathymetric position.

BPI data sets are created from an input bathymetric data set by applying an algorithm that utilizes a focal or neighborhood function. Neighborhood functions produce an output raster in which the output cell value at each location is a function of the input cell value and the values of the cells in a specified "neighborhood" surrounding that location (Figure 3).

In order to derive a BPI value for each cell, a focal or neighborhood function is employed.

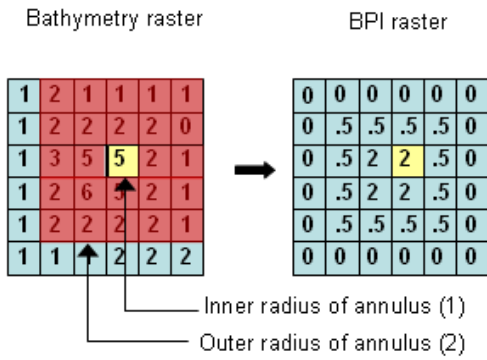


Figure 3 - An example of a neighborhood analysis function using an annulus shape