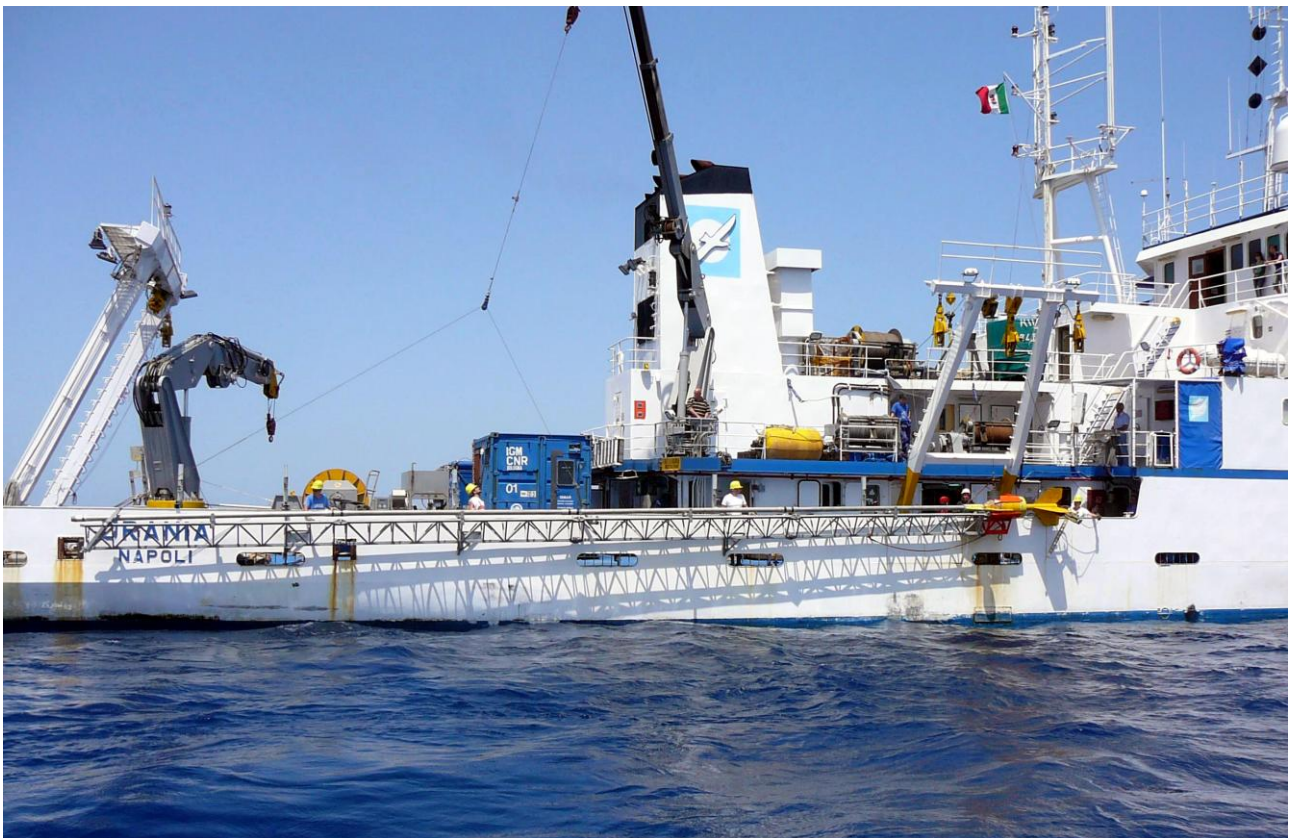


## Case Histories Carma<sup>®</sup> Piston Corer

**Carmacoring S.r.l.** has performed a seabed sampling campaign in Adriatic Sea between 13<sup>th</sup> May and 3<sup>rd</sup> June 2008, conducted by C.N.R. on board of the vessel R/V Urania.

**Carmacoring** has provided the technical advice for C.N.R.- ISMAR Bologna, over the new **Carma<sup>®</sup> Handling System** and the new self-tightening trigger.



Hereafter follows the results:

## PISTON CORES SASSI 2008 Adriatic Sea

Piston Corer n.	Depth (m)	Configuration			Results		
		Length (m)	Free fall (m)	Slack (m)	Penetration (m)	Recovery (m)	% recovered
SI08-01	1082	15	2.90	3.70	15.50	12.29	83.1
SI08-02	1192	15	2.90	3.50	14.50	12.98	88.4
SI08-03	1077	15	2.90	3.70	14.50	11.44	78.2
SI08-05	1127	15	4.10	5.30	13.70	9.00	65.1
SI08-07	1072	15	4.20	5.40	14.50	9.41	64.3
SI08-08	990	15	4.20	5.00	15.50	11.31	76.3
SI08-13	912	15	2.90	3.70	15.70	12.98	87.1
SI08-18	537	20	3.60	5.20	16.55	12.63	75.0
SI08-22	75	15	3.90	4.70	10.80	4.62	42.8
SI08-27	30	15	2.60	3.40	11.20	6.81	60.8
SI08-42	892	20	3.50	4.30	15.70	12.64	80.5
SI08-47	925	10	2.20	3.00	11.00	8.60	88.8
SI08-48	893	10	2.20	3.70	7.70	5.00	64.9
SI08-49	1022	10	2.20	3.40	11.00	8.73	88.2
SI08-50	1009	10	2.20	3.40	9.90	7.71	79.1
SI08-61	151	5	2.40	3.00	4.90	2.80	59.6
SI08-64	159	5	2.40	3.40	4.80	2.90	61.7
SI08-68	145	5	2.40	3.20	5.00	3.20	68.1

**Total samples recovered: 155.05 m**

**Car.ma** carried out a geotechnical survey in 2006 in Makassar Strait (**Indonesia**), for a study concentrated on laying **pipeline**.

The **Active Piston Corer** was the key instrument of the survey: going across deep layers achieved the goal requested by the client.

**Car.ma** provided the **know-how** and the technical advice for IDMC **Impresub S.r.l.** Company during the job performed for the client **Chevron-Unocal**.

## *Geotechnical Survey in Indonesia*

### *Makassar Strait*

During the period between 25th March and 14th April 2006 CAR.MA carried out a geotechnical survey for IMPRESUB onboard the O/V TOISA MARINER in the Makassar Strait, Indonesia.



Hereafter follows the results of all the surveys, divided by instruments used.

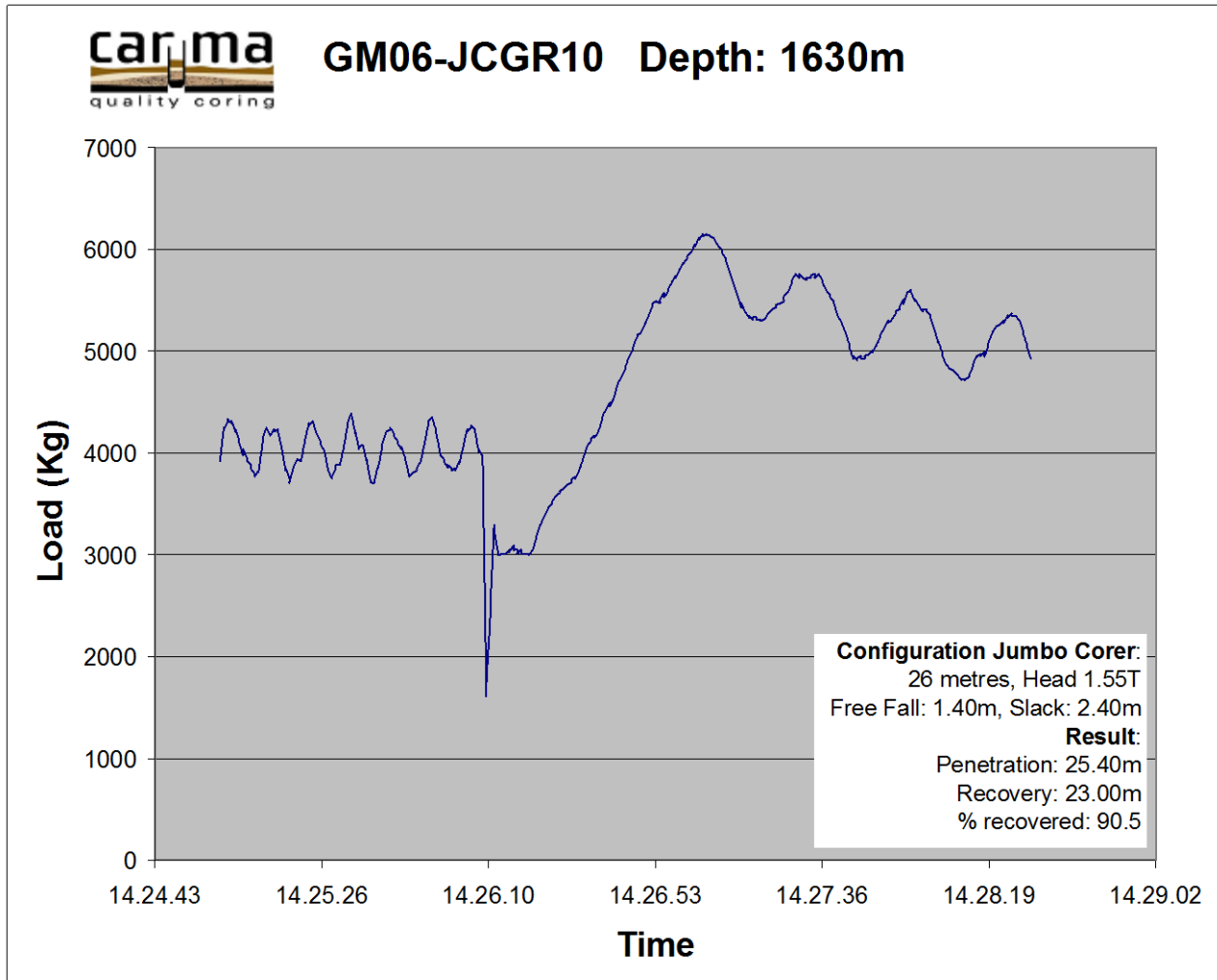
## Jumbo Piston Cores

During this survey 17 jumbo cores in 16 different location were carried out.



Jumbo Corer n.	Depth (m)	Length (m)	Penetration (m)	Recovery (m)	% recovery
JC01	860	16	16.70	14.24	90.7
JC02	1088	16	16.50	13.24	84.3
JC03	893	25	26.00	21.15	85.6
JC04	1126	15	11.80	9.88	83.7
JC05	724	15	10.50	9.15	87.1
JC06	1007	15	10.30	9.14	88.7
JC07	1330	15	10.40	8.55	82.2
JC08	1428	15	15.50	11.20	76.2
JC09	1517	25	15.00	12.71	84.7
JC10	1538	21	13.80	11.92	86.0
JC11	1732	25	24.30	20.40	84.0
JC12	1672	25	23.40	20.10	85.9
JCGR07	1760	26	25.00	22.00	88.0
JCGR09	1578	21	21.00	18.32	88.5
JCGR10	1630	26	25.40	23.00	90.5
JCGR11	1760	26	27.00	23.81	92.61

The strain's graphs, obtained from the software connected to the data of the pulley, allow to verify on-line the course of operations. Hereafter an example:



### Trigger Cores

During this survey 22 trigger cores in 22 different locations were carried out.

Only the GM06-TC04 and GM06-TC09 were performed by the piston. The other triggers were performed using the same corer, but without a trigger and piston, like a gravity corer. The “orange peel” core catcher and the corer nose were substituted by the new nose with 4 spades CAR.MA model.



Piston Corer n.	Depth (m)	Configuration		Results		
		Length (m)	Nose	Penetration (m)	Recovery (m)	% recovery
TC01	500	6	4 spades	3.40	3.05	89.0
TC02	688	10	4 spades	6.70	4.05	60.0
TC03	823	10	4 spades	10.00	10.00	100.0
TC04	1157	6	orange peel	6.00	5.12	89.8
TC05	1336	10	4 spades	6.00	5.12	85.0
TC06	1323	6	4 spades	2.60	2.39	92.0
TC07	1488	10	4 spades	?	7.40	?
TC08	1294	10	4 spades	10.00	7.27	72.7
TC09	1048	6	orange peel	6.00	5.14	90.2
TC10	1371	10	4 spades	?	7.49	?
TC11	1385	10	4 spades	?	7.81	?
TC12	1626	6	4 spades	6.00	6.00	100.0
TC13	1715	10	4 spades	9.80	9.10	93.0
TC14	1775	10	4 spades	10.00	9.12	88.0
TC15	1783	10	4 spades	10.00	9.00	90.0
TC16	1746	6	4 spades	6.00	6.00	100.0

## Gravity Cores

In Indonesia 6 gravity cores in 6 different locations were carried out.

To perform these cores a gravity corer 1.2T with a corer head of 700 Kg was used. The external diameter of the liner was 90mm.

N. Gravity Corer	Depth (m)	Length (m)	Results		
			Penetration (m)	Recovery (m)	% recovered
TCGR01	400	6	?	0.91	?
TCGR02	350	6	0	0	0
TCGR03	415	6	0	0	0
TCGR04	1100	6	7.00	3.12	47.3
TCGR05	1115	6	6.50	3.21	49.4
TCGR06	1150	6	6.40	2.65	41.4

## SOMMARIO

Equipment	N. sampling / attempt	Samples recovered	Recovery %
Jumbo Corer	16 / 17	248.81 m	86.17
Trigger Corer Ø 100	22 / 22	104.90 m	88.44
Gravity Corer Ø 90	06 / 06	9.89 m	46.02
Box Corer	27 / 32	8.59 m	

**Total Samples Recovered: 372.19 m**

The recovery percentage is the average of the ratio between penetration and sample recovered.



Previously the **Marine Geology Institute of CNR** in Bologna had performed numerous surveys in the **Mediterranean Sea, Red Sea, the Atlantic Ocean** and the **Ross Sea** for PNRA (**National Research Project in Antarctica-ENEA**), making use of different sampling instruments designed by Angelo Magagnoli and now commercialized by **Carmacoring S.r.l.**:

*Adriatic Sea 1999 (from 34 to 512m WD)*

N°	Corer setup	Penetration (m)	Core Length (m)	Recovery %
<b>1</b>	<b>CP-10</b>	totale	9.1	<b>93.8</b>
<b>2</b>	<b>CP-15</b>	totale	11.52	<b>78.3</b>
<b>4</b>	<b>CP-15</b>	13.5	11.02	<b>81.6</b>
<b>5</b>	<b>CP-10</b>	7.6	4.95	<b>65.1</b>
<b>6</b>	<b>CP-10</b>	totale	9	<b>92.8</b>
<b>7</b>	<b>CP-15</b>	12.1	7.18	<b>60</b>
<b>13</b>	<b>CP-20</b>	13.3	8.84	<b>66.5</b>
<b>16</b>	<b>CP-10</b>	totale	6.41	<b>66.1</b>
<b>20</b>	<b>CP-10</b>	totale	7	<b>72.2</b>
<b>21</b>	<b>CP-10</b>	8.5	5.78	<b>68</b>

*Adriatic Sea 2000 (from 55 to 112m WD)*

N°	Corer setup	Penetration (m)	Core Length (m)	Recovery %
<b>5</b>	<b>CP-10</b>	totale (10,40)	6.92	<b>71.34</b>
<b>7</b>	<b>CP-10</b>	10.7	8.77	<b>90.4</b>
<b>10</b>	<b>CP-15</b>	12	9.23	<b>77</b>
<b>11</b>	<b>CP-10</b>	10.7	8.7	<b>89.3</b>
<b>12</b>	<b>CP-10</b>	10.6	7.5	<b>77.3</b>
<b>14</b>	<b>CP-10</b>	10.4	8.18	<b>78.65</b>
<b>18</b>	<b>CP-10</b>	8	4.765	<b>60</b>
<b>19</b>	<b>CP-10</b>	10	8.15	<b>81.5</b>
<b>21</b>	<b>CP-10</b>	10.4	6.56	<b>63.1</b>
<b>23</b>	<b>CP-15</b>	11.6	10.2	<b>88</b>



*Adriatic Sea 2001*

N°	Corer setup	Penetration (m)	Core Length (m)	Recovery %
<b>16</b>	<b>CP-15</b>	12.8	11.55	<b>90.23</b>
<b>20</b>	<b>CP-10</b>	10	9.51	<b>95.1</b>
<b>21</b>	<b>CP-10</b>	10.4	5.59	<b>56</b>
<b>23</b>	<b>CP-15</b>	12.4	7.33	<b>59.1</b>
<b>24</b>	<b>CP-10</b>	9.7	6.19	<b>63.8</b>
<b>26</b>	<b>CP_10</b>	10	6.61 + 0,16 naso	<b>67.7</b>
<b>27</b>	<b>CP-10</b>	9	9.54	<b>99</b>
<b>28</b>	<b>CP-10</b>	10	9.32+ 0.12 naso	<b>94.4</b>
<b>29</b>	<b>CP-10</b>	10.3	9.45	<b>94.5</b>
<b>31</b>	<b>CP-15</b>	12.70?	14.47	<b>98.4</b>

*Marmara Sea 2001 (from 110 to 1252m WD)*

N°	Corer setup	Penetration (m)	Core Length (m)	Recovery %
<b>CI 13</b>	<b>CP-15</b>	12.2	10	<b>82</b>
<b>IZ 14</b>	<b>CP-15</b>	9.2	8.21	<b>89?</b>
<b>IZ 31</b>	<b>CP-10</b>	9.4	8.83	<b>94?</b>
<b>PI 40</b>	<b>CP-10</b>	9.4	6.11	<b>65</b>
<b>GA 48</b>	<b>CP-10</b>	8.7	7.53	<b>86.6</b>

*Adriatic Sea 2002 (from 38 to 152m WD)*

<b>N°</b>	<b>Corer setup</b>	<b>Penetration (m)</b>	<b>Core Length (m)</b>	<b>Recovery %</b>
<b>219</b>	<b>CP-10</b>	11	6.4	<b>66</b>
<b>246</b>	<b>CP-10</b>	10.8	7.85	<b>81.7</b>
<b>267</b>	<b>CP-15</b>	13.2	9.27	<b>70.2</b>
<b>270</b>	<b>CP-15</b>	13.35	6.8	<b>52.4</b>
<b>275</b>	<b>CP-15</b>	13.2	6.46	<b>50.5</b>
<b>304</b>	<b>CP-15</b>	14.75	8.59	<b>58.3</b>
<b>305</b>	<b>CP-15</b>	12.9	6.38	<b>51.4</b>
<b>310</b>	<b>CP-15</b>	12.5	6.42	<b>53</b>
<b>321</b>	<b>CP-10</b>	10.7	7.96	<b>82.1</b>
<b>330</b>	<b>CP-10</b>	8.9	6.6	<b>76</b>
<b>342</b>	<b>CP-15</b>	15.6	13.38	<b>92.2</b>
<b>354</b>	<b>CP-10</b>	10.5	8.66	<b>89.3</b>
<b>356</b>	<b>CP-10</b>	10.3	8.1	<b>85.6</b>
<b>357</b>	<b>CP-10</b>	10.3	9.55	<b>98.4</b>
<b>359</b>	<b>CP-15</b>	13.8	9.66	<b>71.2</b>

*Adriatic Sea 2003 (from 402 to 1126m WD)*

<b>N°</b>	<b>Corer setup</b>	<b>Penetration (m)</b>	<b>Core Length (m)</b>	<b>Recovery %</b>
<b>1</b>	<b>CP-15</b>	15.7	14.05	<b>95.6</b>
<b>2</b>	<b>CP-15</b>	14.5	12.06	<b>83.2</b>
<b>3</b>	<b>CP-15</b>	12.2	10.62	<b>87</b>
<b>4</b>	<b>CP-15</b>	14.5	14.51	<b>100</b>
<b>6</b>	<b>CP-20</b>	16	13.02	<b>81.4</b>
<b>8</b>	<b>CP-20</b>	18.4	13.16	<b>71.5</b>
<b>9</b>	<b>CP-15</b>	16	14.48	<b>90.5</b>
<b>11</b>	<b>CP-20</b>	19.5	15.98	<b>82</b>
<b>14</b>	<b>CP-5</b>	6	4.41	<b>93.8</b>
<b>24</b>	<b>CP-20</b>	16	14.07	<b>87.9</b>