



# R F D

(Results-Framework Document)

for

(Ministry of Earth Sciences)

(2011-2012)

## Section 1: Vision, Mission, Objectives and Functions

### Vision

To excel in knowledge and technology enterprise for the earth system science realm towards socio-economic benefit of the Indian sub-continent and in the Indian Ocean region

### Mission

- Provide scientific and technical support for both academic and applied research in Earth System sciences as a whole comprising the atmosphere, hydrosphere, cryosphere and the geosphere, with particular reference to the Indian sub-continent and the surrounding oceans as well as the Polar Regions.
- Provide the Nation with the best possible services in forecasting the monsoons and other weather/climate parameters, ocean state including early warnings to natural disasters like storm surge, earthquakes, tsunamis and other phenomena through well integrated programs.
- Support science, conduct research survey and develop technology for exploration and exploitation of ocean resources (living and non-living), ensuring their sustainable utilization.

### Objective

- 1 To improve weather forecast and provide advisory to agriculture, aviation, shipping, sports including the extended , Long Range Seasonal Monsoon forecast
- 2 To provide a wide range of ocean information advisories including fishery information
- 3 To improve our understanding of Polar Science and its implications for climate change
- 4 To developing technology for harnessing marine resources
- 5 To conduct survey for assessing non-living resources
- 6 To asses coastal marine productivity and Marine Ecosystems
- 7 To improve understanding of Climate Change Science
- 8 To provide early warning of natural hazards viz. cyclone, tsunami, sea level rise.
- 9 To promote basic research including Capacity building in the Earth System Science
- 10 To promote awareness and educate the public by extending support to seminars, symposia, conferences and conduct workshops with stakeholders
- 11 Ensuring compliance to the financial Accountability Framework

## Section 1: Vision, Mission, Objectives and Functions

### Functions

- 1 • To promote dissemination of information in Meteorological and Ocean sectors regarding work being performed by the department and its autonomous bodies to stakeholders and promote establishment of an ocean related information system; • To tune system with a view to encourage formulation of research and development schemes in the ocean sector in a transparent manner, create capacity building and promote human resource development by encouraging research; • To process research proposal for schemes on basic research, application areas and manpower development programmes for Ocean Sciences in a transparent and time-bound manner; • To create awareness about Meteorology/ocean sectors by participation in educational programmes, exhibitions and trade fairs and through partnership with NGOs in order to appreciate the role of the ocean system both as a provider of living and non-living resources, and as major contributor to earth's climate and ecological balance.

## Section 2: Inter se Priorities among Key Objectives, Success indicators and Targets

Objective	Weight	Action	Success	Unit	Weight	Target / Criteria Value				
						Excellent	Very Good	Good	Fair	Poor
						100%	90%	80%	70%	60%
[1] To improve weather forecast and provide advisory to agriculture, aviation, shipping, sports including the extended , Long Range Seasonal Monsoon forecast	25.00	[1.1] Integrated Agro Advisory Services	[1.1.1] Number of Districts covered by Agro Advisory	number	5.00	600	550	525	515	500
		[1.2] Improve Operational Weather Services	[1.2.1] Commissioning & Operation of Super Computer	number	4.00	4	3	2	1	0
			[1.2.2] Strengthen of Observational Network(AWS, ARGs)	number	6.00	1000	950	900	850	800
			[1.2.3] Quality of Research Publications	number of publication	5.00	90	85	80	75	70
			[1.2.4] Application of higher resolution Global Numerical Models	Horizontal resolution (km)	3.00	25	27	30	32	35
			[1.2.5] Completion of Admission process of the first batch of ten students for the advanced training program in Earth System Sciences & Climate	number	2.00	20	15	13	11	9
[2] To provide a wide range of ocean information advisories including fishery information	10.00	[2.1] Strengthening of Ocean Observational network	[2.1.1] Number of deployments	number	2.00	250	240	230	220	210
		[2.2] Installation of ground station for the reception of Oceansat-II/OCM data in real-time	[2.2.1] Operationalisation of Ground station for Oceansat-II	Date	3.00	30/05/2011	30/06/2011	30/07/2011	30/08/2011	30/09/2011
		[2.3] Potential Fishing Zone Advisory & Ocean State	[2.3.1] Potential Fishing Zone Advosory	number	2.00	140	130	120	100	90

## Section 2: Inter se Priorities among Key Objectives, Success indicators and Targets

Objective	Weight	Action	Success	Unit	Weight	Target / Criteria Value				
						Excellent	Very Good	Good	Fair	Poor
						100%	90%	80%	70%	60%
		Forecast Services								
		[2.4] Ocean State Forecast Services	[2.4.1] Ocean State Forecast	number	3.00	365	328	292	255	219
[3] To improve our understanding of Polar Science and its implications for climate change	12.00	[3.1] Planning, Coordination and implementation of Indian Antarctic Program	[3.1.1] Launching of the 31st Expedition	Date	1.20	20/11/2011	01/12/2011	15/12/2011	31/12/2011	15/01/2012
		Planning, Coordination and implementation of Indian Antarctic Program	[3.1.2] Completion of targeted scientific and logistics tasks	--	1.20	100	90	80	70	60
		Planning, Coordination and implementation of Indian Antarctic Program	[3.1.3] Initiation of Phase II construction-stage activities of the 3rd station	Date	0.00	01/12/2011	12/12/2011	27/12/2011	12/01/2012	27/01/2012
		[3.2] Planning, Coordination and implementation of Scientific Expeditions to the Arctic	[3.2.1] Launching of the summer (S) and winter (W) phases of study in the Arctic region	Date	2.40	01/06/2011	15/06/2011	20/06/2011	30/06/2011	15/07/2011
		Planning, Coordination and implementation of Scientific Expeditions to the Arctic	[3.2.2] Completion of all targeted scientific and logistics activities at Ny-Alesund for the year	Date	2.40	25/03/2012	27/03/2012	29/03/2012	30/03/2012	31/03/2012
		[3.3] Planning, Coordination and implementation of Scientific studies in the Indian Ocean sector of the Southern Ocean	[3.3.1] Launching of Southern Ocean Expedition (2011-12)	Date	2.40	15/01/2012	25/01/2012	05/02/2012	10/02/2012	15/02/2012
		Planning, Coordination and implementation of Scientific studies in the Indian Ocean sector of the Southern Ocean	[3.3.2] Completion of analytical work of data collected during the previous expedition and	Date	0.00	15/10/2011	31/10/2011	15/11/2011	30/11/2011	15/12/2011

## Section 2: Inter se Priorities among Key Objectives, Success indicators and Targets

Objective	Weight	Action	Success	Unit	Weight	Target / Criteria Value				
						Excellent	Very Good	Good	Fair	Poor
						100%	90%	80%	70%	60%
			submission							
		[3.4] In-house R&D projects in the fields of cryospheric studies, polar remote sensing, paleoclimatology, polar biology and environmental studies	[3.4.1] Completion of targeted field data collection and analytical work and submission of reports	percentage	1.20	100	90	80	70	60
		In-house R&D projects in the fields of cryospheric studies, polar remote sensing, paleoclimatology, polar biology and environmental studies	[3.4.2] Publication of results in peer-reviewed journals	number of core samples collected	1.20	15	12	10	8	5
[4] To developing technology for harnessing marine resources	12.00	[4.1] Design, Development, installation and Commissioning of Desalination Plant	[4.1.1] Commission and Operation desalination plants in the Minicoy island	Date	4.32	30/12/2011	15/01/2012	31/01/2012	15/02/2012	01/03/2012
		[4.2] Design, Development, installation, and Commissioning of Desalination Plant at Androth	[4.2.1] Commission and operation of desalination plants in the Agatti island	Date	3.12	30/12/2011	15/01/2012	31/01/2012	15/02/2012	01/03/2012
		[4.3] Development of Remotely Operable Vehicle ROSUB 6000 for survey of at PMN site	[4.3.1] Deployment of ROSUB for research	Date	3.12	31/12/2011	31/01/2012	28/02/2012	15/03/2012	31/03/2012
		[4.4] Development of Underwater Collector & Crushing Systems for manganese nodule mining and testing in shallow waters	[4.4.1] Testing of system with reference solid pump	Date	1.44	15/12/2011	15/01/2012	15/02/2012	15/03/2012	31/03/2012
		[4.5] Technology Development for Gas Hydrates – Development of Autonomous coring	[4.5.1] Sea trials of Autonomous Coring System (ACS ) more than 100 m	Date	0.00	30/11/2011	31/12/2011	28/02/2012	15/03/2012	31/03/2012

## Section 2: Inter se Priorities among Key Objectives, Success indicators and Targets

Objective	Weight	Action	Success	Unit	Weight	Target / Criteria Value				
						Excellent	Very Good	Good	Fair	Poor
						100%	90%	80%	70%	60%
		system and sea trials								
[5] To conduct survey for assessing non-living resources	6.00	[5.1] Survey, exploration for Polymetallic Nodules, Cobalt crust, hydrothermal sulphides, gas hydrates, and topographic survey of Exclusive Economic Zone	[5.1.1] Deployment of Research Vessel	sq. km	3.00	24000	20800	16000	14400	11200
		[5.2] Geological and Tectonic Evolution of the Northern Indian Ocean and activities related to Integrated Ocean Drilling Program (IODP)	[5.2.1] Completion of Data analyses pertaining to the Laccadive offshore region; data collection from the forearc region of Andamans and field studies on Barren and Narcondam islands	Date	2.04	31/08/2011	30/09/2011	31/10/2011	01/01/2012	15/02/2012
		Geological and Tectonic Evolution of the Northern Indian Ocean and activities related to Integrated Ocean Drilling Program (IODP)	[5.2.2] IODP workshop on the Indian proposal for scientific drilling in the Arabian Sea; revision and submission of the scientific proposal to IODP based on the comments/ observations from the reviewers; Participation of Indian scientists in IODP cruise	Date	0.96	31/10/2011	15/11/2011	30/11/2011	15/12/2011	15/01/2012
[6] To assess coastal marine productivity and Marine Ecosystems	5.00	[6.1] Integration and analysis of field data, Simulation of models,	[6.1.1] Finalization of Shoreline Management	Date	2.00	31/01/2012	15/02/2012	29/02/2012	15/03/2012	31/03/2012

## Section 2: Inter se Priorities among Key Objectives, Success indicators and Targets

Objective	Weight	Action	Success	Unit	Weight	Target / Criteria Value				
						Excellent	Very Good	Good	Fair	Poor
						100%	90%	80%	70%	60%
		validation of results and preparation of Shoreline management plan	Plan for Gopalpur coast							
		Integration and analysis of field data, Simulation of models, validation of results and preparation of Shoreline management plan	null null	number	0.00	--	--	--	--	--
		[6.2] Establishment of Indian Ocean biogeographical Information System (IndOBIS)	null No. of records.	number	1.00	5000	4000	3000	2000	1000
		[6.3] Perfect technology for breeding and rearing of 5 species of clownfish and one specie of damsel fish at CMLRE hatchery at Lakshadweep and its commercialisation	null No. of species.	number	2.00	25000	20000	15000	10000	5000
[7] To improve understanding of Climate Change Science	5.00	[7.1] To set up Centre for Climate Change Research (CCCR) at IITM with dedicated research facilities	null Recruitment of scientific positions	number	2.50	6	5	4	2	1
		To set up Centre for Climate Change Research (CCCR) at IITM with dedicated research facilities	null Cumulative Impact Factor of the Research Papers	number	2.50	22	20	15	10	10
[8] To provide early warning of natural hazards viz. cyclone, tsunami, sea level rise.	5.00	[8.1] Issues of Earthquake bulletin with minimum time lag after the earth quake on sea-bed	null Number of EQ bulletins issued within 12 minutes after the earthquake(%)	percentage	2.00	100	98	95	--	--
		[8.2] Issue of Tsunami Warning with	null Number of Tsunami	percentage	2.00	100	98	95	--	--

## Section 2: Inter se Priorities among Key Objectives, Success indicators and Targets

Objective	Weight	Action	Success	Unit	Weight	Target / Criteria Value				
						Excellent	Very Good	Good	Fair	Poor
						100%	90%	80%	70%	60%
		minimum time lag after the earth quake on sea-bed	Bulletins issued within 30 minutes after the earthquake(%)							
		[8.3] Issue of Tsunami warning with minimum time lag after the earth quake on sea-bed	null Accuracy of warning(%)	percentage	1.00	80	70	60	--	--
[9] To promote basic research including Capacity building in the Earth System Science	2.50	[9.1] To strengthen capacity development and promote research outside the ministry	null Supporting research and academic programmes in Earth System Science	Number of Projects	2.50	12	10	8	6	4
[10] To promote awareness and educate the public by extending support to seminars, symposia, conferences and conduct workshops with stakeholders	2.50	[10.1] Conducting user oriented workshops with key stakeholder to promote awareness	null Conducting user oriented workshops with key stakeholder to promote awareness	Number	1.25	20	17	15	12	10
		[10.2] Support seminar/symposium/conference in the field of earth sciences	null Support seminar/symposium/conference in the field of earth sciences	--	1.25	75	50	30	40	20
* Efficient Functioning of the RFD System	3.00	Timely submission of Draft for Approval	On-time submission	Date	2.0	07/03/2011	08/03/2011	09/03/2011	10/03/2011	11/03/2011
		Timely submission of Results	On- time submission	Date	1.0	01/05/2012	03/05/2012	04/05/2012	05/05/2012	06/05/2012
* Improving Internal Efficiency / Responsiveness / Service delivery of Ministry / Department	10.00	Implementation of Sevottam	Resubmission of revised draft of Citizens' / Clients' Charter	Date	2.0	15/12/2011	20/12/2011	25/12/2011	28/12/2011	31/12/2011
			Independent Audit of Implementation of Grievance Redress Mechanism	%	2.0	100	95	90	85	80

\* Mandatory Objective(s)

## Section 2: Inter se Priorities among Key Objectives, Success indicators and Targets

Objective	Weight	Action	Success	Unit	Weight	Target / Criteria Value				
						Excellent	Very Good	Good	Fair	Poor
						100%	90%	80%	70%	60%
		Ensure compliance with Section 4(1) (b) of the RTI Act, 2005	No. of items on which information is uploaded by February 10, 2012	No	2.0	16	15	14	13	12
		Identify potential areas of corruption related to departmental activities and develop an action plan to mitigate them	Finalize an action plan to mitigate potential areas of corruption.	Date	2.0	10/02/2012	15/02/2012	20/02/2012	24/02/2012	29/02/2012
		Develop an action plan to implement ISO 9001 certification	Finalize an action plan to implement ISO 9001 certification	Date	2.0	10/02/2012	15/02/2012	20/02/2012	24/02/2012	29/02/2012
* Ensuring compliance to the Financial Accountability Framework	2.00	Timely submission of ATNS on Audit Paras of C&AG	Percentage of ATNS submitted within due date (4 months) from date of presentation of Report to Parliament by CAG during the year.	%	0.5	100	90	80	70	60
		Timely submission of ATRs to the PAC Sectt. on PAC Reports.	Percentage of ATRs submitted within due date (6 months) from date of presentation of Report to Parliament by PAC during the year.	%	0.5	100	90	80	70	60
		Early disposal of pending ATNs on Audit Paras of C&AG Reports presented to Parliament before 31.3.2011.	Percentage of outstanding ATNs disposed off during the year.	%	0.5	100	90	80	70	60
		Early disposal of pending ATRs on PAC Reports presented to Parliament before 31.3.2011	Percentage of outstanding ATRs disposed off during the year.	%	0.5	100	90	80	70	60

\* Mandatory Objective(s)

### Section 3: Trend Values of the Success Indicators

Objective	Action	Success	Unit	Actual Value	Actual Value	Target Value	Projected Value for	Projected Value for
				FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY 13/14
[1] To improve weather forecast and provide advisory to agriculture, aviation, shipping, sports including the extended , Long Range Seasonal Monsoon forecast	[1.1] Integrated Agro Advisory Services	[1.1.1] Number of Districts covered by Agro Advisory	number	0	549	550	--	--
	[1.2] Improve Operational Weather Services	[1.2.1] Commissioning & Operation of Super Computer	number	0	1	3	--	--
	Improve Operational Weather Services	[1.2.2] Strengthen of Observational Network(AWS, ARGs)	number	0	839	950	--	--
	Improve Operational Weather Services	[1.2.3] Quality of Research Publications	number of publication	0	170	85	--	--
	Improve Operational Weather Services	[1.2.4] Application of higher resolution Global Numerical Models	Horizontal resolution (km)	0	25	27	--	--
	Improve Operational Weather Services	[1.2.5] Completion of Admission process of the first batch of ten students for the advanced training program in Earth System Sciences & Climate	number	--	10	15	25	--
[2] To provide a wide range of ocean information advisories including fishery information	[2.1] Strengthening of Ocean Observational network	[2.1.1] Number of deployments	number	0	234	240	--	--
	[2.2] Installation of ground station for the reception of Oceansat-II/OCM data in real-time	[2.2.1] Operationalisation of Ground station for Oceansat-II	Date	15/03/2010	31/10/2010	30/06/2011	--	--

### Section 3: Trend Values of the Success Indicators

Objective	Action	Success	Unit	Actual Value FY 09/10	Actual Value FY 10/11	Target Value FY 11/12	Projected Value for FY 12/13	Projected Value for FY 13/14
	[2.3] Potential Fishing Zone Advisory & Ocean State Forecast Services	[2.3.1] Potential Fishing Zone Advisory	number	113	72	130	--	--
	[2.4] Ocean State Forecast Services	[2.4.1] Ocean State Forecast	number	--	365	328	--	--
[3] To improve our understanding of Polar Science and its implications for climate change	[3.1] Planning, Coordination and implementation of Indian Antarctic Program	[3.1.1] Launching of the 31st Expedition	Date	06/11/2009	20/12/2010	01/12/2011	--	--
	Planning, Coordination and implementation of Indian Antarctic Program	[3.1.2] Completion of targeted scientific and logistics tasks	--	100	100	90	--	--
	Planning, Coordination and implementation of Indian Antarctic Program	[3.1.3] Initiation of Phase II construction-stage activities of the 3rd station	Date	11/12/2009	01/11/2010	12/12/2011	--	--
	[3.2] Planning, Coordination and implementation of Scientific Expeditions to the Arctic	[3.2.1] Launching of the summer (S) and winter (W) phases of study in the Arctic region	Date	60	80	15/06/2011	--	--
	Planning, Coordination and implementation of Scientific Expeditions to the Arctic	[3.2.2] Completion of all targeted scientific and logistics activities at Ny-Alesund for the year	Date	--	15/02/2010	27/03/2012	--	--
	[3.3] Planning, Coordination and implementation of Scientific studies in the Indian Ocean sector of the Southern Ocean	[3.3.1] Launching of Southern Ocean Expedition (2011-12)	Date	60	80	25/01/2012	--	--

### Section 3: Trend Values of the Success Indicators

Objective	Action	Success	Unit	Actual Value FY 09/10	Actual Value FY 10/11	Target Value FY 11/12	Projected Value for FY 12/13	Projected Value for FY 13/14
	Planning, Coordination and implementation of Scientific studies in the Indian Ocean sector of the Southern Ocean	[3.3.2] Completion of analytical work of data collected during the previous expedition and submission	Date	--	--	31/10/2011	--	--
	[3.4] In-house R&D projects in the fields of cryospheric studies, polar remote sensing, paleoclimatology, polar biology and environmental studies	[3.4.1] Completion of targeted field data collection and analytical work and submission of reports	percentage	55	75	90	--	--
	In-house R&D projects in the fields of cryospheric studies, polar remote sensing, paleoclimatology, polar biology and environmental studies	[3.4.2] Publication of results in peer-reviewed journals	number of core samples collected	25	55	12	75	--
[4] To developing technology for harnessing marine resources	[4.1] Design, Development, installation and Commissioning of Desalination Plant	[4.1.1] Commission and Operation desalination plants in the Minicoy island	Date	--	28/02/2011	15/01/2012	--	--
	[4.2] Design, Development, installation, and Commissioning of Desalination Plant at Androth	[4.2.1] Commission and operation of desalination plants in the Agatti island	Date	--	31/05/2010	15/01/2012	--	--
	[4.3] Development of Remotely Operable Vehicle ROSUB 6000 for survey of at PMN site	[4.3.1] Deployment of ROSUB for research	Date	--	28/02/2011	31/01/2012	--	--

### Section 3: Trend Values of the Success Indicators

Objective	Action	Success	Unit	Actual Value FY 09/10	Actual Value FY 10/11	Target Value FY 11/12	Projected Value for FY 12/13	Projected Value for FY 13/14
	[4.4] Development of Underwater Collector & Crushing Systems for manganese nodule mining and testing in shallow waters	[4.4.1] Testing of system with reference solid pump	Date	70	80	15/01/2012	--	--
	[4.5] Technology Development for Gas Hydrates – Development of Autonomous coring system and sea trials	[4.5.1] Sea trials of Autonomous Coring System (ACS ) more than 100 m	Date	--	--	31/12/2011	--	--
5 To conduct survey for assessing non-living resources	[5.1] Survey, exploration for Polymetallic Nodules, Cobalt crust, hydrothermal sulphides ,gas hydrates,and topographic survey of Exclusive Economic Zone	[5.1.1] Deployment of Research Vessel	sq. km	0	172	20800	--	--
	[5.2] Geological and Tectonic Evolution of the Northern Indian Ocean and activities related to Integrated Ocean Drilling Program (IODP)	[5.2.1] Completion of Data analyses pertaining to the Laccadive offshore region; data collection from the forearc region of Andamans and field studies on Barren and Narcondam islands	Date	--	10/11/2010	30/09/2011	--	--
	Geological and Tectonic Evolution of the Northern Indian Ocean and activities related to Integrated Ocean Drilling Program (IODP)	[5.2.2] IODP workshop on the Indian proposal for scientific drilling in the Arabian Sea; revision and submission of the	Date	--	31/03/2010	15/11/2011	31/03/2012	--

### Section 3: Trend Values of the Success Indicators

Objective	Action	Success	Unit	Actual Value FY 09/10	Actual Value FY 10/11	Target Value FY 11/12	Projected Value for FY 12/13	Projected Value for FY 13/14
		scientific proposal to IODP based on the comments/ observations from the reviewers; Participation of Indian scientists in IODP cruise						
[6] To assess coastal marine productivity and Marine Ecosystems	[6.1] Integration and analysis of field data, Simulation of models, validation of results and preparation of Shoreline management plan	[6.1.1] Finalization of Shoreline Management Plan for Gopalpur coast	Date	--	15/02/2011	15/02/2012	--	--
	Integration and analysis of field data, Simulation of models, validation of results and preparation of Shoreline management plan	null null	number	--	90	--	--	--
	[6.2] Establishment of Indian Ocean biogeographical Information System (IndOBIS)	null No. of records.	number	45000	100	4000	--	--
	[6.3] Perfect technology for breeding and rearing of 5 species of clownfish and one specie of damsel fish at CMLRE hatchery at Lakshadweep and its commercialisation	null No. of species.	number	60	100	20000	--	--
[7] To improve understanding of Climate Change Science	[7.1] To set up Centre for Climate Change Research (CCCR) at IITM with dedicated research facilities	null Recruitment of scientific positions	number	19	24	5	--	--

### Section 3: Trend Values of the Success Indicators

Objective	Action	Success	Unit	Actual Value FY 09/10	Actual Value FY 10/11	Target Value FY 11/12	Projected Value for FY 12/13	Projected Value for FY 13/14
	To set up Centre for Climate Change Research (CCCR) at IITM with dedicated research facilities	null Cumulative Impact Factor of the Research Papers	number	7.5	15	20	--	--
8 To provide early warning of natural hazards viz. cyclone, tsunami, sea level rise.	[8.1] Issues of Earthquake bulletin with minimum time lag after the earthquake on sea-bed	null Number of EQ bulletins issued within 12 minutes after the earthquake(%)	percentage	95	98	98	--	--
	[8.2] Issue of Tsunami Warning with minimum time lag after the earthquake on sea-bed	null Number of Tsunami Bulletins issued within 30 minutes after the earthquake(%)	percentage	95	98	98	--	--
	[8.3] Issue of Tsunami warning with minimum time lag after the earthquake on sea-bed	null Accuracy of warning(%)	percentage	60	70	70	--	--
9 To promote basic research including Capacity building in the Earth System Science	[9.1] To strengthen capacity development and promote research outside the ministry	null Supporting research and academic programmes in Earth System Science	Number of Projects	0	90	10	--	--
10 To promote awareness and educate the public by extending support to seminars, symposia, conferences and conduct workshops with stakeholders	[10.1] Conducting user oriented workshops with key stakeholder to promote awareness	null Conducting user oriented workshops with key stakeholder to promote awareness	Number	10	38	17	--	--
	[10.2] Support seminar/symposium/conference in the field of earth sciences	null Support seminar/symposium/conference in the field of earth sciences	--	75	150	50	--	--

\* Mandatory Objective(s)

### Section 3: Trend Values of the Success Indicators

Objective	Action	Success	Unit	Actual Value	Actual Value	Target Value	Projected Value for	Projected Value for
				FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY 13/14
* Efficient Functioning of the RFD System	Timely submission of Draft for Approval	On-time submission	Date	--	05/03/2010	07/03/2011	--	--
	Timely submission of Results	On- time submission	Date	30/04/2010	29/04/2011		--	--
* Improving Internal Efficiency / Responsiveness / Service delivery of Ministry / Department	Implementation of Sevottam	Resubmission of revised draft of Citizens' / Clients' Charter	Date	--	--		--	--
		Independent Audit of Implementation of Grievance Redress Mechanism	%	--	--		--	--
	Ensure compliance with Section 4(1) (b) of the RTI Act, 2005	No. of items on which information is uploaded by February 10, 2012	No	--	--		--	--
	Identify potential areas of corruption related to departmental activities and develop an action plan to mitigate them	Finalize an action plan to mitigate potential areas of corruption.	Date	--	--		--	--
	Develop an action plan to implement ISO 9001 certification	Finalize an action plan to implement ISO 9001 certification	Date	--	--		--	--
* Ensuring compliance to the Financial Accountability Framework	Timely submission of ATNS on Audit Paras of C&AG	Percentage of ATNS submitted within due date (4 months) from date of presentation of Report to Parliament by CAG during the year.	%	--	100		--	--
	Timely submission of ATRs to the PAC Sectt. on PAC Reports.	Percentge of ATRs submitted within due date (6 months) from date of presentation of Report to Parliament by PAC during the year.	%	--	100		--	--

\* Mandatory Objective(s)

### Section 3: Trend Values of the Success Indicators

Objective	Action	Success	Unit	Actual Value FY 09/10	Actual Value FY 10/11	Target Value FY 11/12	Projected Value for FY 12/13	Projected Value for FY 13/14
	Early disposal of pending ATNs on Audit Paras of C&AG Reports presented to Parliament before 31.3.2011.	Percentage of outstanding ATNs disposed off during the year.	%	--	100		--	--
	Early disposal of pending ATRs on PAC Reports presented to Parliament before 31.3.2011	Percentage of outstanding ATRs disposed off during the year.	%	--	100		--	--

\* Mandatory Objective(s)

**Section 4:  
Description and Definition of Success Indicators  
and Proposed Measurement Methodology**

**Section 4: Description and Definition of Success Indicators and Proposed Measurement Methodology**

Objective	Action	Success Indicator	Definitions/Methodology
<b>1. To improve weather forecast and provide specific advisory to agriculture, aviation, shipping, sports including the extended , Long Range Seasonal (Monsoon) forecast</b>	<b>Integrated Agro Advisory Services</b>	<b>Number of Districts covered by Agro Advisory</b>	<b>Weekly District level weather forecast &amp; advisories to farmers in India</b>
	<b>Improve Operational Weather Services</b>	<b>Commissioning &amp; Operation of Super Computer</b>	<b>AWS= Automatic Weather Stations to acquire real-time data ARG= Automatic Rain Gauge to acquire real-time data on rainfall</b>
	<b>Research Publications for operational forecast ( IMPACT FACTOR</b>	<b>Impact Factor is a measure reflecting the average number of citations to articles published in science and technology journals.</b>	

**Application of higher resolution Numerical Models**      **Progressive decrease in Root Mean Square Error (RMSE) of forecast fields. (eq. 850hPa winds over the Indian region)**

**Strengthening of Ocean Observational network**

**Number of deployments**

**Observational platforms viz Argo floats, satellite tracked drifters, current meter moorings, ADCP moorings, XBTs, etc are to be deployed to strengthen and expand the ocean observational network.**

**ISRO has agreed for the set up ground station at INCOIS**

**for the direct reception of ocean colour data used to issue the potential Fishing zone advisories.**

**The ground station includes the installation of 7.5 dia antenna,**

**Site Preparation for Oceansat-II-ground station.**

**Establishment of ground station for Oceansat-II.**

**2. To provide a wide range of ocean information advisories including fishery information**

**tracking system and data processing system. Ground Station for Oceansat-II will be completed in May 2011..**

**The advisories on Potential Fishing Zone and Ocean State Forecast are provided to fishing community through the Electronic Display Boards installed at fishing harbours and fish-landing centers. More number of such boards will be installed at more locations to increase the dissemination**

**Potential Fishing Zone Advisory & Ocean State Forecast Services**

**Increase in dissemination of Advisories through installation of Electronic Boards**

**Planning,                      Launching of Annual      Actual completion of**

	<b>Coordination and implementation of Indian Antarctic Program</b>	<b>Expedition to Antarctica, Strengthening of Maitri, Establishment of New Station, and completion of targeted scientific and logistics activities</b>	<b>all targeted scientific data collection; Launching and returning of the expedition as per schedule.</b>
<b>3. To improve the understanding of Polar Science and its implications in climate change</b>	<b>Planning, Coordination and implementation of Scientific Expeditions to the Arctic</b>	<b>Launching of Summer &amp; Winter Indian Arctic Expeditions, and completion of targeted scientific and logistics activities</b>	<b>Actual completion of all targeted scientific data collection; Launching and returning of the expedition as per schedule.</b>
	<b>Planning, Coordination and implementation of Scientific studies in the Indian Ocean sector of the Southern Ocean</b>	<b>Launching of Southern Ocean Expedition</b>	<b>Actual completion of all targeted scientific data collection; Launching and returning of the expedition as per schedule.</b>
	<b>Collection and analysis of ice core from Antarctic</b>	<b>Ice Coring and Cryophilic research</b>	<b>No. of cores collected vis-à-vis planned and No. of samples analysed vis-à-vis planned</b>
<b>4. To developing technology for harnessing the marine</b>	<b>Design, Develop, install, and Commission of Desalination Plant</b>	<b>Setting up of land based desalination plants in the Lakshadweep islands</b>	<b>Desalination Plants to convert sea water into potable water</b>

resources	<p>Development of Remotely Operable Vehicle( ROSUB 6000) for survey at PMN site</p> <p>Technology Development for Gas Hydrates</p> <p>–Development of Autonomous coring system(ACS) and sea trials</p>	<p>Sea trials of ROSUB in the Deep Sea</p> <p>Sea trials of ACS</p>	<p>Equipment for survey and exploration</p> <p>Equipment for collection of samples</p>
5. To conduct survey for assessing the non-living resources	<p>Maintenance of buoy network</p> <p>To acquire the scientific &amp; technical data from parts of the Bay of Bengal and the Arabian Sea in and off the Indian EEZ &amp; to prepare &amp; submit the claims in accordance with the provisions of United Nation’s Convention on Law of Sea (UNCLOS).</p>	<p>Continuous, high quality data return</p> <p>Preparation of Documentation and submission of India’s claim to the Commission on Limits of Continental Shelf (CLCS)</p>	<p>Instrument for Acquisition of real-time data from seas around India</p> <p>Submission of India’s claims to the CLCS</p> <p>Completion and commissioning of the marine geophysical data base.</p>
6. To asses the coastal marine productivity and Marine Ecosystems	<p>Demonstration of hatchery technology on Ornamental fish and setting-up of field station at Lakshadweep.</p>	<p>Establishment of laboratory in Agatti for Ornamental fish culture.</p>	<p>Operationalisation of Hatchery</p>

	<b>Integrated Coastal Marine Area Management</b>	<b>Development of sediment transport model for Gopalpur, Orissa</b>	<b>Management Plan</b>
<b>7. To improve the understanding of Climate Change Science</b>	<b>To set up the Centre for Climate Change Research (CCCR) at IITM with dedicated research facilities</b>	<b>Establishment of centre by inducting scientists</b>	<b>Centre for conducting research in the field of climate change</b>
<b>8. To provide early warning of natural hazards viz. cyclone, tsunami, sea level rise.</b>	<b>Tsunami Advisory Services</b>	<b>Issue of Tsunami warning with minimum time lag after the occurrence of earthquake on the sea-bed</b>	<b>The process of issuing the tsunami early warning involves the detection of the occurrence of earthquake its magnitude and location, assessment of tsunami genesis potential and confirmation of the generation of tsunami through the real time monitoring of sea levels at nearest sea level gauges and bottom pressure recorders. For the warning to be effective and useful, the time lag between the occurrence of earthquake on the sea bed and the tsunami early warning should be minimum.</b>

**9. To promote basic research including Capacity building in the Earth System Science**

**To strengthen capacitydevelopment and promote research outside the ministry**      **Supporting research and academic programmes in Earth System Science**

**Number of i) Research projects awarded ii) Academic Programmes initiated iii) Centres Established with MoES Supported(iv) collaborative projects at national and international levels**

**Supported (iv) collaborative projects at national and International levels**

### Section 5: Specific Performance Requirements from other Departments

#### Section 5; Specific Performance Requirements from other Departments

S.No.	Objective	Department	Relevant Success Indicator	What do you need?	Why do you need it?	How much you need?	What happens if you do not get it?
1.	To improve weather forecast and provide advisory to agriculture, aviation, shipping, sports including the extended , Long Range Seasonal Monsoon forecast	State Agriculture Department I.C.A.R ( Ministry of Agriculture) Water Resources Ministry of Civil Aviation Department of Space	Number of Districts covered by Agro Advisories	Feedback and dissemination of information	To validate the forecast	50%	Project could not be implemented fully
		Ministry of Civil Aviation Department of Space	Strengthen of Observational Network(A WS, ARGs, etc., )	Coordination for deployment of observation based systems	To install various in-situ and space instrument	50%	Augment observational network of both insitu- and space based systems

2	To Provide a wide range of ocean information advisories including fishery information	State Fishery Department Fisherman association Department of Space	Potential Fishing Zone Advisories	Feedback and dissemination of information	To validate the forecast	50%	Project could not be implemented fully
3	To improve understanding of Polar Science and its implications for climate change	Planning Commission	Launching Expeditions to the Antarctic and Arctic	Mandatory ingredients for program implementation	Funds required for launching expeditions	In full measure	Project could not be implemented fully
4	To develop technology of harnessing the marine resources	Lakshadweep Administration (Ministry of Home Affairs) Water Resources	Setting up of one land based desalination plant in Lakshadweep island	Provide Logistical support for construction and transport of material	To set up Desalination Plant	Full	Project gets delayed 6 to 8 months
5	To assess coastal marine productivity and Marine Ecosystems	Lakshadweep Administration (Ministry of Home Affairs) Fishery Department	Establishment of Laboratory in Kavaratti for Ornamental fish culture	Transfer of Lakshadweep administration Bldg.	To set up Hatchery	50% of Lakshadweep Administration on place.	Project gets delayed by 1- 2 years

6	. To provide State early Administrati warning of on natural NDMA( hazards viz. Ministry of Cyclone, Home tsunami, Affairs) sea level rise	Issue of Earthquake and bulletin with disseminati minimum on of time lag information after the earth quake on sea-bed	Feedback To validate 50% the forecast	Project could not be impleme nted fully
7	To promote Academia, basic State research Universities and including , IIT Capacity (MHRD) building in the Earth System Science	Supporting research and academic programme s in Earth System Science	MemorunduSmooth 60% m of implementa Understanding of ng extramural; projects	Deliverable s could not be achieved.

## Section 6: OutCome/Impact of Department/Ministry

OutCome/Impact of Department/Minist	Jointly responsible for influencing this outcome / impact with the following department (s) /	Success	Unit	FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY 13/14
1 Improved weather forecasting	State Governemtns, Ministry of Agriculture, Ministry of Water Resources	Accurate Forecasts	%	60	62	75	78	80
2 Improved ocean advisories including fishery information	SRO, State Governments	Accurate advisories	%	65	67	70	75	85
3 Improvd understanding of climate change	Participating organizations, Research Advisory Committee of NCAOE/NCAP	To be decided	%	999	999	999	999	999
4 Improved technology for marine harnessing	Coastal and island administrations, Shipping Corporation of India	Increase in harness of marine products	%	60	62	65	70	75
5 Improved natural hazard forecasting	IMD, SOI, NIOT, ICMAM, ISRO, MHA, NDMA, NEOCS, DEOCs, State Governments	Accurate forecasting/advisories	%	70	72	75	78	80