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REPUBLIC OF SOUTH AFRICA



Offshore Oil and Gas Environmental Research Collaboration Project

Research Opportunity Exploitation Report

Final Report

V5: 11 December 2015



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Annex 1. Detailed inventory of research requests

1. Introduction

The Offshore Oil and Gas Environmental Research Collaboration Project is a project to implement Operation Phakisa's Offshore Oil and Gas Exploration Initiative B3: Exploiting the broader research opportunities presented by offshore oil and gas exploration.

The overall objective of the project is to support the inclusive process of development of the **South African Marine Research and Exploration Forum (SAMREF)**. SAMREF will be a multi-sector forum, inclusive of public and private sectors that would:

- Identify and take advantage of opportunities provided by oil and gas exploration activities and platforms, to gather important marine ecosystem data which would otherwise be difficult and expensive to obtain.
- Facilitate new collaborative offshore studies that would increase South Africa's state of knowledge of the offshore marine environment, related to renewable energy potential, marine biodiversity and ecology, climate change and ecosystem functioning.

A Working Group consisting of various government departments and the private sector has been constituted with the overall responsibility of overseeing the implementation of the project. It is operationally supported by the Project Management Team that consists of the DST staff, the Working Group Secretariat and the scientific service provider that drives, coordinates and collates input for the development of SAMREF. The NRF-SAEON (National Research Foundation-South African Environmental Observation Network) through its Egagasini Node for Marine-Offshore Systems, has been contracted by the Department of Science and Technology as the scientific service provider. The Knowledge Fields Development (KFD) directorate of the NRF acts as the Secretariat for the project and Working Group.

Offshore oil and gas exploration has the potential to provide a unique opportunity to gather important research information that would normally be difficult to obtain due to the expense of dedicated research voyages. Industry vessels and fixed platforms frequently put to sea and hence have the capacity to obtain and share such data. In turn, the marine research community has the knowledge and willingness to work with industry in order to get maximum potential from the data they are collecting.

The objectives of this Research Opportunity Exploitation (ROE) Report are to compile an assessment of the research opportunities that are currently available, and which could practically be exploited through collaboration with oil and gas exploration, and other private sector activities

This report will be used as the reference for SAMREF, and for the various agreements to be reached between willing partners in their collaborations going forward.

2. Research requests

In the consultative process for identifying research requests from public sector academics, two inclusive meetings were held; a kick-start workshop for the project, and a research sector workshop. In addition, a questionnaire was circulated to identify research interests and potential public-private sector collaboration. A wide variety of research ideas were consequently identified, including some from the private sector.

The kick-start workshop for the project was held on 23 and 24 July 2015 at the Old Mutual Centre, Kirstenbosch, Cape Town. Participation in the kick-start workshop was open to all parties (private sector / public sector / academic) who have an interest in offshore marine research and industry in South Africa, including those currently involved in offshore oil and gas exploration and ocean-related climate change, biodiversity, natural resource management, renewable energy or related activities.

The kick-start workshop was a multi-stakeholder (research through to industry) workshop with the following objectives; that all participants:

- share a common understanding of the Offshore Oil and Gas Environmental Research Collaboration Project and its objectives, limitations and opportunities,
- have a common general understanding of offshore research and exploration activities taking place in South Africa's EEZ,
- share a common understanding of government's broader Marine and Antarctic research programme and vision, and how Phakisa Project B3 fits into this vision,
- contribute to the design and establishment of the proposed South African Marine Research and Exploration Forum (SAMREF),
- have a chance to actively contribute to the stakeholder database and the general project approach, and
- clearly articulated their interest, desires, needs, concerns, commitment, role and/or responsibilities within the project context.

Notification about the project, and about the kick-start workshop, was sent out via the SANCOR mailing list, via the Project Working Group, via the Project Management Team and also via the Ocean Energy Network mailing list. The project team contacted key stakeholders in advance of the meeting, and also set up:

- The stakeholder database for the project
- An online RSVP system, specifically for the kick-start workshop
- A brief stakeholder questionnaire to collect information about the organisations in the stakeholder database, and to get some preliminary views from stakeholders on strengths, opportunities, weaknesses and threats facing the forum (see Annex 8).

The meeting was attended by 86 participants from government, the private sector, NGOs, universities and research institutions. The group photograph may be downloaded from this [link](#) and the report from the meeting is available at this [link](#).

The kick-start workshop report was used in the development of the Research Catalogue and Gap Analysis Report as well as to guide further interviews with stakeholders and to plan the Research Sector meeting. It will be used on an ongoing basis as one of the resources for the identification of opportunities for public-private cooperation, and also to recognise threats and weaknesses that need to be mitigated going forward.

The Research Sector workshop for the project was held on 17 and 18 September 2015 at the Old Mutual Centre, Kirstenbosch, Cape Town. Participation in the research sector workshop was also open to all parties (private sector / public sector / academic) who have an interest in offshore marine research and industry in South Africa, including those currently involved in offshore oil and

gas exploration and ocean-related climate change, biodiversity, natural resource management, renewable energy or related activities.

The workshop focused on identifying and investigating opportunities for cooperation in more detail. Prior to the meeting, two brief forms were circulated for

- a) Researchers to outline the (potential) requests they had identified that could be taken forward for industry to respond to, and
- b) Representatives from industry to identify opportunities that exist within their company or sector that could be taken up by researchers.

A stakeholder database and an online RSVP system were also set up.

In particular, the workshop aimed to:

1. Understand and capture the interests of the research community
2. Investigate the additional opportunities provided by the private sector, and understand the requirements in order for these opportunities to be taken up
3. Collect information to refine the design of SAMREF as a forum that can broker agreements between the private and public sectors.

The meeting was attended by 60 participants. The focus was on group work to allow for discussions around research opportunities and requests, and several were successfully identified. The report for the research sector meeting is available online on the SAMREF website (<http://samref.dirisa.org/>).

Research ideas were requested by industry to enable them to consider and discuss how collaborations could be set up. Research Opportunities would be confirmed by industry as a response, and presented in the Research Opportunity Exploitation (ROE) Report. The database of research requests is continually updated and should be used as a resource by SAMREF going forward. A summary of research requests to date is presented below, and details of each one is presented in Annex 1.

Research Requests (project/question titles)
OBSERVATIONS/SURVEYS
Interactions between cetaceans and seismic surveys
The study of floating oil rigs/drilling vessels as potential vectors for marine alien species
Distribution/presence of seabirds; data of AS@S (Atlas of Seabirds at Sea)
Habitat mapping for spatial planning - Benthic biodiversity surveys to assist with marine spatial planning.
Habitat mapping for ecological research and species distribution mapping.
Bathymetry data for navigational products
Extension of MMO mandate to include birds [noted that MMO does include any interactions with birds already and this could refer to additional bird observations].
3 Monitoring lines off south coast collecting CTD, oxygen, ADCP and UTD data, Monitoring of HABS
Ad hoc benthic photographic sampling (during drifting). Foundational biodiversity, groundtruthing.
Establishment of potential fishery around fixed infrastructure.
Effects of deploying wave turbine in the offshore environment on the ecosystem.
Marine fauna observations by industry staff on supply/guard vessels.
Atmospheric data collection and analyses from offshore vessels.
Investigation of migration in fish, cetaceans and sharks
DEPLOYMENTS
Argo, observational oceanography, ship-based training outside of current research fields - more in line with industry i.e. seafloor mapping and analysis, link into consultancy, parallel interest possibly to be served within the operational oceanography AMS degree as presented by M Vichi..
Deployment of observing systems on platforms. Deployment of lagrangian floats/drifters

Atmospheric observer / observation programme. Deployment of equipment on new vessels / bouys / rigs. To include synoptic wx observations and possibly air quality monitoring
Examine the potential for integrating fish farming and OG sector synergies (floating, mooring).
Collection of new abiotic and biotic data (dissolved O2 , temp, fluorescence, colour, plankton, fibre optics, optical plankton counters, turbidity sensors).
BASELINE SURVEYS
Spatial distribution of marine mammals
A study of the Agulhas current – observations, modelling and forecasts.
Reef fish and habitat surveys using baited remote underwater stereo-video systems (stereo-BRUVs) for environment baseline studies and ecological research
Baseline ambient noise data (reef noise, fish choruses etc.) and data on marine mammal distribution from the Wild Coast area prior to seismic exploration.
Marine spatial planning with conservation of benthic and pelagic biodiversity in mind.
Obtain historical data from Oil and Gas industry
Impact of artificial reefs on the environment. Change of community structure.
Updating baseline desktop data (oceanographic, benthos) for SA Coastline for OG, fishing sector. Collation of existing data locality specific EIAs. Up to date as possible. Consolidated report for data output.
Ambient acoustic monitoring around SA.
Update the Generic EMPr Generic Environmental Management Programme Report (EMPr) compiled for oil and gas exploration in South Africa (CCA & CMS 2001).

3. Research opportunities

SAMREF aims to have a particular focus on facilitating access to data collected from the private sector platforms of the offshore Oil & Gas industry, Fisheries and Mining sectors. Research opportunities have been identified at the kick-start meeting, the research sector meeting, as well as through direct interviews with companies and regulators.

In most cases, while the initial opportunities have been identified, the negotiation of agreements will need to take place on a bilateral basis between the willing partners. The SAMREF charter will guide the process, and successful collaborations will be tracked. SAMREF (once it is launched) will make stakeholders aware of requests and opportunities on an ongoing basis, going forward.

New at-sea Research Opportunities

Possible data acquisition platforms for researchers include:

- Drilling vessels
- Support/supply vessels transporters
- Data acquisition vessels (surveys)
- ROV
- Met-Ocean buoys
- Sampling (gliders, CTDs)

As these platforms are already being utilised by the O&G industry, it would minimise the costs of collecting data for researchers. However, the O&G industry is still relatively new in SA, and few exploration activities are currently taking place, so opportunities for at-sea research are limited.

In the meantime it is recommended that opportunities provided by the existing production platform are investigated, and that opportunities based on historical data sets are pursued.

Several opportunities have been raised by the fisheries sector for the collection of underway data on commercial fishing vessels. There is potential to link up with similar science programmes in other areas and with other organisations, for example the Coalition of Legal Toothfish Operators (COLTO). The South African Demersal Trawl Industry Association (SADSTIA) has also expressed willingness to cooperate on joint research projects.

New Opportunities based on historical data

Several opportunities are available based on historical metocean datasets kept by offshore vessel companies, and data of non-commercial interest archived by PASA. During O&G surveys, examples of other data collected are marine mammal observations, current data, CTD data and underway data (conductivity, depth soundings and surface temperature data). These data could possibly be used for new desktop studies e.g. ocean circulation patterns around the coast of SA, marine fauna distribution patterns, wind energy resources, benthic habitat mapping and the validation of satellite data and models. SAMREF is in the process of establishing a metadatabase for the documentation of the location and procedures for access of such data.

An opportunity has been raised for the development and or expansion of the upstream training trust for training beyond the geosciences, but that is considered probably beyond the scope of SAMREF, and could potentially be taken up by the trustees of the Upstream Training Trust.

For input into the ROE report, every O&G operator was contacted personally (with the approval of OPASA), for updated information that could be used in the report. PASA was also contacted in order to ensure that the interest of the regulator were correctly reflected. The two fisheries associations that had expressed interest in SAMREF were also contacted, for them to pass the information on to their representatives and partners, and consequently for input into the ROE report.

Companies and associations contacted for specific input into this ROE report included:

- Thombo Thombo
- Premier Oil
- CNR International
- Afren plc
- Sunbird Energy (Ibhubesi) (PTY) Ltd
- Bayfield Energy
- Total E&P South Africa
- Chevron
- Impact Oil & Gas Ltd
- ExxonMobil Exploration and Production South Africa Ltd.
- Sungu Sungu
- Silverwave Energy PTE Ltd. / Brilliant Oil & Gas
- New Age
- Pan African Energy
- BHP Billiton Petroleum Limited
- NT Energy Africa
- Cairn India
- Premier Oil
- Anadarko Petroleum Corporation
- Shell South Africa Exploration B.V.
- Halliburton/Landmark
- Rhino Oil & Gas Exploration
- OK Energy Ltd.
- PetroSA
- Sasol
- SADSTIA
- COLTO

The Petroleum Agency of South Africa (PASA) was also contacted for input as well as to review the first draft.

Although few concrete opportunities were identified due to the current status of activity in the industry, those that were can be seen to be test cases for SAMREF, and important guidance has been received for SAMREF going forward.

Direct input from the following companies was received:

Total E&P South Africa (TEPSA)

At this stage there are unfortunately no new research opportunities from TEPSA's current operations. However should any potential new research opportunities arise from future offshore activities, TEPSA will send them through to SAMREF.

One of these potential future opportunities identified by TEPSA included collaborative research project(s) on the Agulhas current off the Southern coast of South Africa and they are willing to work with interested research stakeholders on this topic. Research could include gathering and analyses of historical data; building accurate forecasting models that can better predict current movement and current characteristics. This initiative will however need to come from the research stakeholders and protocol will have to be followed from TEPSA's side regarding agreements and requirements of the regulator.

Anadarko

At this stage it is difficult to provide specific possible future projects that we may be able to assist with however Anadarko is currently collaborating on with SANBI and the university of KZN, and this is the type of project that Anadarko would continue doing when we acquire new data sets.

Operators in the oil and gas sector have to provide copies of all the data we acquire to PASA, however it has to remain confidential for a certain period of time unless agreed to [in writing] by both the operator and PASA. Each operator will have different requirements in order to release the data and this can take a while for agreements to be put in place to protect the confidentiality of the data. I see SAMREF playing a role in connecting parties. Once an operator decides on a data acquisition programme then they should let SAMREF know what it is and what opportunities may exist for collaboration, it will help if we are kept abreast of the research requests.

OK Energy Ltd.

Exploration licences are still with the Ministry and have not been issued for further exploration. There is little to be contributed at this stage but please contact us again mid-2016 and hopefully things will have progressed.

Shell South Africa Upstream B.V.

Three opportunities are:

- Availability of existing seismic data for seafloor mapping (seafloor geomorphology / bathymetry)
- Availability of existing marine mammal data (observation reports and sound data)
- Possibility of making future video data (if we proceed with exploration drilling) available from Remote Operated Vehicles for seafloor scanning for archaeological remains/shipwrecks

The time frame for cooperation is:

- Immediately for existing seismic data and marine mammal data.
- Once Shell makes a decision to proceed with exploration drilling, discussions can commence on how to structure a co-operation agreement/MOU for the provision of video data from Remote Operated Vehicles.

The opportunity involves accessing existing data for the seismic data and existing marine mammal data, whereas the exploration drilling would generate new data.

There are no foreseen financial implications, except time for putting agreements in place for exchange and use of data. Research Agreements or Data Sharing Contracts or MOU's need to be

in place for transfer of data and clarification of data ownership, confidentiality and use of research outputs. PASA needs to be consulted on any agreements that involve data managed by the regulator.

SA Navy Hydrographic Office

Possible collaboration between the Navy and Department of Environmental Affairs for use of SA Agulhas to perform surveys other than surveys required specifically for own scientific purposes, when the vessel is not in use. The Navy could also use SA Agulhas as a training platform as well as to perform valuable surveys (once validated and of acceptable quality) which can be made available to interested industry sectors for research purposes.

Discussion would have to take place between the Department of Environmental Affairs and the SA Navy regarding technical issues and logistics. The data recorded by vessels could be submitted to a central data centre where industry sectors could access such data under strict security conditions, subject to data usage agreements.

It should be noted that in RSA, waters deeper than 200m, 88% is deemed to be unsurveyed. Very little academic or commercial data has been rendered to the Hydrographic Office. A concerted effort should be made to obtain access to all available data to populate and improve the National Bathymetric Database. The SA Navy is the co-ordinator for GEBCO data within its waters and it has been many years since any data has been rendered to the Hydrographic Office for updating of this database.

Sunbird Energy

An opportunity exists to potentially use berths on a vessel which will be undertaking a geo-survey of a pipeline route off the NW coast of South Africa. This will not take place before March 2016. All appropriate health and safety requirements would have to be met, and PASA would have to approve the terms of any data sharing agreement. Further details could be discussed in 2016.

I&J

I&J are in the process of exploring a partnership with a higher learning institution for the mining and verification of historical metocean (oceanographic and atmospheric) data from fishing vessels, to be reanalysed and used in various research projects.

A new opportunity being explored by the company is the development of black boxes on its fishing vessels to collect data from on-board sensors, including atmospheric, sea surface, and sub-sea sensors attached to nets. Data could then be streamed automatically to an on-shore data management system on the docking of the vessel. Once the trial has been tested / demonstrated (late 2016), there might be opportunity to roll the system out across fishing vessels in other companies willing to cooperate.

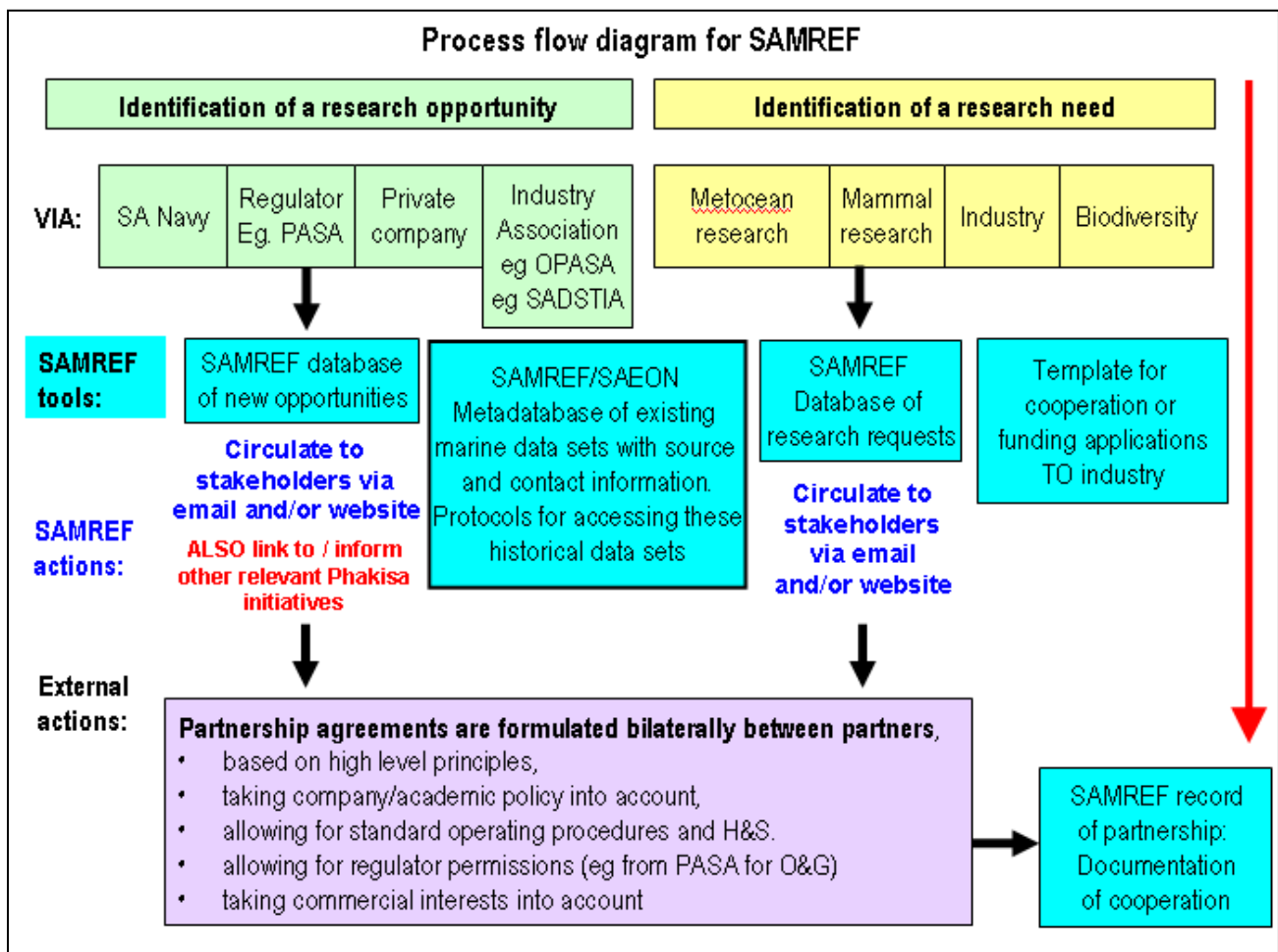
Multi-client survey companies

An additional opportunity exists for approaching multi-client survey companies who carry out geophysical surveys in areas where there are already existing rights (exploration or production rights). Some data (eg MMO data) are already submitted to PASA, but there might be opportunities for additional partnerships.

Way forward

In addition to the opportunities identified at this stage, in advance of the launch of SAMREF, it was important to identify a process-flow for the identification and uptake of future opportunities going forward. The SAMREF forum, supported by the secretariat, is envisaged to follow the following pathway when research requests or opportunities are identified.

1. Research opportunities and research requests would be identified by any one of the SAMREF partners or other interested parties. Opportunities and requests would be captured into the two databases that have been established for this purpose. They are available online and remain 'living databases' as they will be continually updated.
2. Requests and opportunities would be circulated to stakeholders actively, by brief email, with a link to the details online.
3. A metadatabase of existing marine data sets generated from the private sector would also be available. This would allow the identification of historical data sets of interest, with clear guidelines on application procedures and contact details for custodians of data sets.
4. Partnership agreements would be formulated bilaterally between partners, but would be expected to follow the spirit of the SAMREF Charter. Partnership agreements would specify terms and conditions of IP, data sharing and the availability of products.
5. SAMREF would keep a record of partnership to track successful cooperation activities.



4. Stakeholder database

The stakeholder database is continually updated as people change positions and responsibilities. The database has grown consistently since the inception of the B3 project, and now covers a wide range of researchers and representatives of industry.

The database will be used to circulate information about events, research requests and research opportunities.

First Name	Surname	Organisation
Nazmi	Adams	Thombo Thombo
Rob	Anderson	Department of Agriculture, Forestry and Fisheries
Marc	Andrioli	NECSA
Isabelle	Ansorge	UCT Oceanography
Shankar	Aswani	Rhodes University, Anthropology Department
Lara	Atkinson	South African Environmental Observation Network
Colin	Attwood	University of Cape Town
Thomas	Auf der Heyde	Department of Science and Technology
Johann	Augustyn	SADSTIA
Bjorn	Backeberg	Nansen-Tutu Centre for Marine Environmental Research, UCT
Brian	Balazs	UNX Energy
Richard	Ball	SA Patagonian Toothfish Assn
Jaco	Barendse	
Will	Barker	Sunbird Energy (Ibhubesi) (PTY) Ltd
Paul	Barrett	OK Energy
Mieke	Barry	Aurecon
Doug	Bells	Cheseapeake
Andrei	Belopolsky	Premier Oil
Selwyn	Bergman	Dept. Environmental Affairs
Anthony	Bernard	SAEON
Ric	Bernard	Rhodes University
Sidney	Bilski	Metocean Services International
Jane	Blomkamp	Bowman Gilfillan
Paul	Board	Robertson
Mpumzi	Bonga	The Department of Mineral Resources
Tommy	Bornman	South African Environmental Observation Network
MICHAEL	BOTHA	GSIG
Alan	Boyd	Department: Environmental Affairs
Sokari P.	Braide	UWC
Andrew	Brierley	University of St Andrews
Erika	Brown	Anchor Environmental
Serge	Brun	Schlumberger
Geoff	Brundrit	
Jacques	Burgers	Seiche Measurements
Doug	Butterworth	University of Cape Town
Deirdre	Byrne	DEA
Matthew	Carr	UCT
Barry	Clark	Anchor Environmental Consultants
Marthinus	Cloete	Council for Geoscience
Linda	Clokie	private

Andy	Cockcroft	Department of Agriculture, Forestry and Fisheries
Janet	Coetzee	Department of Agriculture, Forestry and Fisheries
Rob	Coles	CNR
Charine	Collins	SAEON
Kyle	Cooper	SAEON
Robert	Cooper	Department of Agriculture, Forestry and Fisheries
Melleney	Cope	Department of Agriculture, Forestry and Fisheries
Jessica	Courtoreille	PetroSA
Robert	Crossley	Robertson CGG
Jock	Currie	South African Environmental Observation Network
Charlene	da Silva	Department of Agriculture, Forestry and Fisheries
Hunter	Danque	Anadarko
Johannes	de Goede	Department of Agriculture, Forestry and Fisheries
Answa	de Lange	PetroSA
Stephanie	de Villiers	DEA: Oceans and Coasts Research
Henry	Delafon	TOTAL - Total E&P South Africa
Eric	Deliac	Halliburton/Landmark
Roseanne	Diab	Academy of Science of South Africa
Matt	Dicken	KZN Sharks Board
Firoze	Din	Corelab
Xolisa	Dlomo	SAEON
Mbulelo	Dopolo	South African National Parks
Chris	Drage	PGS
Kirsten	Du Plessis	I&J
Nicole	du Plessis	SAEON
Derek	Du Preez	Coastal and Marine Research Institute, NMMU
John	Duncan	WWF-SA
Christopher	Duncombe Rae	DEA: Oceans and Coasts
Deon	Durholtz	Department of Agriculture, Forestry and Fisheries
Andrew	Dymond	Afren plc
Jan Willem	Eggink	Shell
Simon	Elwen	Sea Search
Tracey	Fairweather	Department of Agriculture, Forestry and Fisheries
Sean	Fennessy	Oceanographic Research Institute
John	Field	University of Cape Town
Zoleka	Filander	DEA
Ken	Findlay	Mammal Research Institute Whale Unit
Karin	Fivaz	GCS Water and Environment
Melissa	Fourie	Centre of Environmental Rights
Anschen	Friedrichs	Sunbird Energy (Ibhubesi) (PTY) Ltd
Alison	Futter	Offshore Petroleum Association of South Africa / PetroSA
Robert	Gair	Bayfield Energy
Granville	Gary Louw	Department of Agriculture, Forestry and Fisheries
Alessandro	Gelmetti	eni e&p
Mark	Gibbons	UWC
Jean	Githaiga-Mwicigi	Department of Agriculture, Forestry and Fisheries
David	Glassom	UKZN
Jean	Glazer	Department of Agriculture, Forestry and Fisheries
Jan	Glazewski	UCT
Wayne	Goshen	South African Environmental Observation Network
Tess	Gridley	Sea Search Africa
Eduard	Groenewald	Total E&P South Africa

Mthuthuzeli	Gulekana	DEA
Jim	Gulland	CGG Veritas
Christina	Hagen	BirdLife South Africa
John	Hall	Spectrum
Charles	Hammond	Chevron
Shannon	Hampton	IOI-SA
Jean	Harris	Ezemvelo KwaZulu-Natal Wildlife
Linda	Harris	Nelson Mandela Metropolitan University
Chris	Heinecken	CapFish
David	Herbert	KwaZulu-Natal Museum
Juliet	Hermes	South African Environmental Observation Network
Elodie	Heyns	Student/ post doc
Robert	Higgins	Petrosa
Andre	Hoek	Sea Technology Services (Pty) Ltd
Greg	Hofmeyr	Port Elizabeth Museum at Bayworld
Catherine	Horsfield	Centre of Environmental Rights
Wim	Hugo	South African Environmental Observation Network
Kenneth	Hutchings	Marine Research Institute & Anchor Environmental
Larry	Hutchings	University of Cape Town
Steve	Ilett	Impact Oil & Gas Ltd
Daniel Seth	Jackofsky	ExxonMobil Exploration and Production South Africa Ltd.
Raoul	Jacquand	CGG Veritas
Andrew	James	Ovenstone Agencies (Fisheries)
Bridget	James	Sea Search
David	Japp	CapMarine/CapFish
C	Johnsen	Durban University of Technology
Ashley	Johnson	Department: Environmental Affairs
Sean	Johnson	Petroleum Agency South Africa
Tamryn	Johnson	Aurecon
Tembisa	Jordaan	Ezemvelo KZN Wildlife
Mohammed	Kajee	UCT
Abri	Kampfer	SA Navy
Andrew	Kaniki	National Research Foundation
Sven	Kerwath	Department of Agriculture, Forestry and Fisheries
Thabang	Kgomo	Sungu Sungu
Steve	Kirkman	Department: Environmental Affairs
Tracy	Klarenbeek	National Research Foundation
Nhlanhla	Kubheka	New Age, Geophysicist
Andrew	Lambert	Kinetiko
Piet	Lambregts	Shell
Tarron	Lamont	Department: Environmental Affairs
Rob	Landman	I&J
Susan	Lane	Sue Lane & Associates Environmental Services
Nigel	Langridge	Total
Burger	Lategan	DMR
Richard	Layfield	Exxonmobil
Anton	le Roux	UCT
Solomon	Lephoto	Sungu Sungu Petroleum
Robin	Leslie	Department of Agriculture, Forestry and Fisheries
Marriott	Liesl	Sasol Petroleum International

Justin	Lime	Anadarko
Lee-Kong	Lin	Silverwave Energy PTE Ltd. / Brilliant Oil & Gas
Tamsyn	Livingstone	Ezemvelo KZN Wildlife
Hugh	Lloyd	Deepwater research
Amanda	Lombard	NMMU and UCT
Nicole	Lomberg	Impact Africa
Dave	Loran	New Age
Darren	Lucas	Kosmos Energy
Katrin	Ludynia	University of Cape Town
Peter	Lukey	Department: Environmental Affairs
Sean	Lunn	Offshore Petroleum Association of South Africa / Impact Oil and Gas
Mmamokete	Mabuela	National Research Foundation
Fiona	MackKay	Oceanographic Research Institute
Liwalam	Madikiza	Department: Environmental Affairs
Denise	Mager	JAYMAT Enviro Solutions
Fezile	Mahlati	Pan African Energy
Prideel	Majiedt	South African National Biodiversity Institute
Mapula Salome	Makwela	SAEON/SANBI
Jean	Malan	New Age, Geologist
Tsamaelo	Malebu	South African National Biodiversity Institute
Thembakazi	Mali	South African National Energy Development Institute
Roy	Manson-Brebner	Aberdeen Offshore Engineering
Bronwyn	Maree	BirdLife
Jeremy	Marillier	FishSA
Thomas C.	Mason	BHP Billiton Petroleum Limited
Leluma	Matooane	DST
Craig	Matthysen	Lwandle Technologies
Nxumalo	Mbalenhe	NRF
David J.	McClean	Anadarko Petroleum Corporation
Kirsty	McQuaid	SRK Consulting (South Africa) Pty Ltd
Lindiwe	Mekwe	Petroleum Agency South Africa
Adri	Meyer	BirdLife South Africa
Imke	Meyer	Centre for Renewable and Sustainable Energy Studies, Stellenbosch University
Guy	Midgley	Stellenbosch University
Daniel	Mikes	NMMU
Jon M.	Miller	WesternGeco
Steve	Mills	Shell South Africa Exploration B.V.
Siyasanga	Miza	SANBI
Lithakazi Shine	Mkatshwa	South African Weather Service
Thokozani	Mkhize	EKZNW
Nonhle	Mngadi	Ezemvelo
Katherine	Moffet	SAEON
Fiona	Moir	NT Energy Africa
Tebogo	Mojafi	SAMSA
Coleen	Moloney	University of Cape Town
Pedro	Monteiro	Council for Scientific and Industrial Research, Center for High Performance Computing (CSIR-CHPC)
Caitlin	Moore	PetroSA
Luke	Moore	RHDHV

Tammy	Morris	South African Environmental Observation Network
Karabo	Motlana	Oceana Group
Samson	Mukaratirwa	University of Kwazulu-Natal
Stet	Mushwana	Petroleum Agency SA
Mduduzi	Mzimela	University of Zululand
Ashley	Naidoo	Department: Environmental Affairs
Bryaleen	Naidoo	University of KwaZulu-Natal
Derek	Needham	Sea Technology Services (Pty) Ltd
Herman	Neethling	Shell
Phumla	Ngesi	Petroleum Agency SA
Sindiswa	Nhlumayo	SAMSA
Nosizwe	Nokwe	PetroSA
Margaux	Noyon	University of Cape Town
Nolubabalo	Ntunzi	AGEC EC
Raeesa	October	WESTERN CAPE GOVERNMENT DEPARTMENT OF ECONOMIC DEVELOPMENT AND TOURISM
LAWRENCE	OELLERMANN	ORI
Alexis	Olds	CapeNature
Ane	Oosthuizen	South African National Parks
Herman	Oosthuizen	Department: Environmental Affairs
Mimonitu	Opuwari	University of the Western Cape
Steve	O'Reardon	CNR International
Claude	Orgill	WESTERN CAPE GOVERNMENT DEPARTMENT OF ECONOMIC DEVELOPMENT AND TOURISM
Kelly	Ortega	Rhodes University
Ryan	Palmer	SAIAB
Angus	Paterson	South African Institute for Aquatic Biodiversity
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