

# **Questionnaire on Dust and Ocean Biogeochemical Monitoring and Research Capacity in ROPME Member States**

The aim of this questionnaire is to find out the monitoring and research capacity within ROPME Member States related to research on dust and ocean biogeochemistry. This will be used to develop a coherent and inclusive scientific programme for a regional study on the “Monitoring and Assessment of Sand and Dust Storms on the Marine Environment in the ROPME Sea Area”.

This questionnaire will be divided into two sections.

Please complete this questionnaire, adding all the information relevant to each question and the national contact person of your country

**THE SURVEY HAS TWO SECTIONS COVERING:**

**Section 1: Dust monitoring, analysis, and modelling**

**Section 2: Ocean biogeochemical and biological parameter monitoring, analysis, and modelling**

**INSTITUTIONAL INFORMATION:**

**Name of the Member State** :

**National Contact Person**  
**(PROF./DR./MR./MRS./MS.)** :

**Position** :

**Institution** :

**Postal Address** :

**Telephone No.** :

**Telefax** :

**E-MAIL** :

**http://**

**DATE:** \_\_\_\_\_

\_\_\_\_\_  
**SIGNATURE**

Please, return the completed form at your earliest convenience, but not later 31<sup>st</sup> December 2015 to the following address:

**ROPME, P.O. Box 26388, Safat 13124, State of Kuwait**  
**Fax: +965 25324172 / 25335237**  
**E-mail: [ropme@ropme.org](mailto:ropme@ropme.org)**

## **Section 1: Dust monitoring, analysis, and modelling**

### **Section 1.1: Dust, air quality, and meteorology monitoring stations**

*In-situ* instruments to monitor airborne dust and other pollutants are currently used by environmental networks, Universities and research institutes. So, it is highly recommended to include information about instruments and networks owned by both and other national entities. Model of instrument in operation, coordinates and height, name of the network, Near Real Time (NRT) data availability to the Met Service (or not) and period of data records should be reported in Table 1.

**Table 1: Air quality monitoring; Please add rows as necessary**

| Method   | Model | Lat. | Long. | Height | Network/<br>institution | NRT?     | Data<br>available<br>since when |
|--|-------|------|-------|--------|-------------------------|----------|---------------------------------|
| PM10/PM2.5<br>gravimetric method   |       |      |       |        |                         | Yes / No |                                 |
| PM10 Beta-<br>attenuation  |       |      |       |        |                         | Yes / No |                                 |
| PM10 Tapered<br>Element Oscillating<br>Microbalance<br>(TEOM)                          |       |      |       |        |                         | Yes      |                                 |
| PM10 TEOM-FDRS<br>(Filter Dynamics<br>Measurement<br>System)                           |       |      |       |        |                         | Yes      |                                 |
| PM10 Chemical<br>Speciation (Chemical<br>composition)                                  |       |      |       |        |                         | Yes / No |                                 |
| SO <sub>2</sub>  |       |      |       |        |                         | Yes / No |                                 |
| O <sub>3</sub>   |       |      |       |        |                         | Yes / No |                                 |
| NOx and/or NO <sub>2</sub>   |       |      |       |        |                         | Yes / No |                                 |
| CO   |       |      |       |        |                         | Yes / No |                                 |
| Volatile Organic<br>Compounds (VOCs)   |       |      |       |        |                         | Yes / No |                                 |
| Meteorological<br>parameters (wind<br>speed, wind<br>direction, humidity,<br>rainfall) |       |      |       |        |                         |          |                                 |

**PLEASE COPY AND FILL IF THERE ARE MULTIPLE STATIONS**

## Section 1.2: Chemical and mineralogical analysis of airborne dust or dustfall

Chemical and mineralogical analysis of airborne dust or dustfall at Universities and research institutes should be reported in Table 2.

**Table 2: Chemical and mineralogical analysis of particulate matter or dustfall**

| Parameter  | Methods | Lat. | Long. | Height | Network/<br>institution | Scientist<br>in charge;<br>Email<br>address | Data<br>available<br>since when |
|--|---------|------|-------|--------|-------------------------|---|---------------------------------|
| <b>Particulate<br/>matter Chemical<br/>Speciation<br/>(Chemical<br/>composition)</b> |         |      |       |        |                         |   |                                 |
|  |         |      |       |        |                         |   |                                 |
|  |         |      |       |        |                         |   |                                 |
|  |         |      |       |        |                         |   |                                 |
|  |         |      |       |        |                         |   |                                 |
|  |         |      |       |        |                         |   |                                 |
| <b>Dust fall<br/>speciation<br/>(Chemical<br/>composition)</b>                       |         |      |       |        |                         |   |                                 |
|  |         |      |       |        |                         |   |                                 |
|  |         |      |       |        |                         |   |                                 |
|  |         |      |       |        |                         |   |                                 |
|  |         |      |       |        |                         |   |                                 |
|  |         |      |       |        |                         |   |                                 |

### Section 1.3: Ground-based remote sensing observations

Ground-based remote sensing techniques for aerosol/dust monitoring are normally used by Universities and research institutes. So, it is highly recommended to include information about instruments and networks owned by national external entities. Model of instrument in operation, coordinates and height, name of the network, Near Real Time (NRT) data availability (or not) and period of data records should be reported in Table 3.

Table 3: Ground-based remote sensing observations; please add rows as necessary

| Method  | Model | Lat. | Long. | Height | Network/<br>institution | NRT?     | Data<br>available<br>since when |
|---|-------|------|-------|--------|-------------------------|----------|---------------------------------|
| Sunphotometers observations within the international AERONET network based on Cimel instruments |       |      |       |        |                         | Yes / No |                                 |
| Other automatic Sunphotometers  |       |      |       |        |                         | Yes / No |                                 |
| Hand Sunphotometers   |       |      |       |        |                         | Yes      |                                 |
| Lidars  |       |      |       |        |                         | Yes      |                                 |
| New generation Ceilometers (vertical backscattering)  |       |      |       |        |                         | Yes / No |                                 |

## Section 1.4: Satellite observations

Please, specify the satellite sensor used to monitor/characterize dust and/or aerosols in your country. Please, contact the remote sensing institutes of your country in order to report on national capabilities.

**Table 4: Satellite-borne observations; Please, add rows as necessary**

| Sensor                          | Product | Quantitative use (images)   | Quantitative use (data)     | Period since |
|---------------------------------|---------|-----------------------------|-----------------------------|--------------|
| Seviri/MSG<br>Yes / No          |         | Yes / No<br>Please specify: | Yes / No<br>Please specify: |              |
| MODIS<br>Aqua/Terra<br>Yes / No |         | Yes / No<br>Please specify: | Yes / No<br>Please specify: |              |
| OMI/Aura<br>Yes / No            |         | Yes / No<br>Please specify: | Yes / No<br>Please specify: |              |
| NOAA-nn<br>Yes / No             |         | Yes / No<br>Please specify: | Yes /No<br>Please specify:  |              |
| Seawifs/EOS-AM<br>Yes / No      |         | Yes / No<br>Please specify: | Yes /No<br>Please specify:  |              |
| CALIOP/CALIPSO<br>Yes / No      |         | Yes / No<br>Please specify: | Yes /No<br>Please specify:  |              |
| GOME/ERS2<br>Yes / No           |         | Yes / No<br>Please specify: | Yes /No<br>Please specify:  |              |
| IASI<br>Yes / No                |         | Yes / No<br>Please specify: | Yes /No<br>Please specify:  |              |

Is there in your country a specialized centre for satellite data reception that can be useful for dust storm study? (Yes / No)  
If so please describe and provide contact details of scientist in charge.

## Section 1.5: Analytical capacity of airborne dust and dust fall

Analytical capacity of airborne dust or dustfall at Universities and research institutes should be reported in Table 5.

**Table 5: Analytical capacity related to chemical and mineralogical analysis of particulate matter**

| <b>Parameters</b>   | <b>Analytical instruments</b> | <b>Institution</b> | <b>Scientist in charge</b> |
|---|-------------------------------|--------------------|----------------------------|
| <b>Trace metals</b>   |                               |                    |                            |
| <b>Crustal elements</b>   |                               |                    |                            |
| <b>Mineralogy</b>   |                               |                    |                            |
| <b>Aerosol nutrients:<br/>nitrate, phosphorus,<br/>ammonium</b> |                               |                    |                            |
| <b>Molecular markers</b>  |                               |                    |                            |
| <b>Ionic species</b>  |                               |                    |                            |

## Section 1.6: Modelling capacity of airborne dust and dust fall

Please, describe in this section the aerosol/dust models you use for dust monitoring and/or dust reanalysis. Please, include modelling capabilities/use of Universities and research institutions of your country.

Table 6: Dust modelling

| Model                     | Center                | Do you use this model for dust forecasting?<br>Tick for yes | Do you use this products for case analysis?<br>Tick for yes | Period since | Scientist in charge |
|---------------------------|-----------------------|---|---|--------------|---------------------|
| BSC-DREAM8b               | BSC-CNS               |   |   |              |                     |
| CHIMERE                   | LMD                   |   |   |              |                     |
| DREAM-NMMEMACC            | SEEVCCC               |   |   |              |                     |
| GEOS-5                    | NASA                  |   |   |              |                     |
| LMDzT-INCA                | LSCE                  |   |   |              |                     |
| MACC-ECMWF                | ECMWF                 |   |   |              |                     |
| MetUM                     | UK Met office         |   |   |              |                     |
| NGAC                      | NCEP                  |   |   |              |                     |
| NAAPS                     | US Navy               |   |   |              |                     |
| NMMB/BSCDust              | BSC-CNS               |   |   |              |                     |
| Multi model Dust Products | SDS WAS<br>NAMEE Node |   |   |              |                     |
| TMS/BSCDream8b            | TSME                  |   |   |              |                     |
| Others                    |                       |   |   |              |                     |

In case your country has an institution that has developed and/or run a model of aerosol/dust, please include the following information:

**Table 7: Main features of your aerosol/dust model**

|                               |  |
|-------------------------------|--|
| <b>Model</b>                  |  |
| <b>Institution</b>            |  |
| <b>Meteorological Driver</b>  |  |
| <b>Geographical Domain</b>    |  |
| <b>Emission scheme</b>        |  |
| <b>Horizontal Resolution</b>  |  |
| <b>Vertical Resolution</b>    |  |
| <b>Height first layer</b>     |  |
| <b>Radiation interactions</b> |  |
| <b>Transport size Bins</b>    |  |
| <b>Data assimilation</b>      |  |
| <b>Other features</b>         |  |

## **Section 1.7: Additional Information**

**Please use this section to add any information which can be useful but not included in the questionnaire. This section can be used to comment on the questionnaire itself.**

**Section 2: Ocean biogeochemical and biological parameter monitoring, analysis, and modelling**

Please list in-situ and offline instruments to monitor physical and chemical properties of the ocean in Table 8.

**Table 8: Air quality monitoring; Please add rows as necessary**

| Method       | Lat. | Long. | Height | Network/<br>institution | Coastal? | NRT?     | Data<br>available<br>since<br>when | Scientist<br>in<br>charge;<br>Email |
|--------------|------|-------|--------|-------------------------|----------|----------|------------------------------------|-------------------------------------|
| pH           |      |       |        |                         | Yes / No | Yes / No |                                    |                                     |
| Salinity     |      |       |        |                         | Yes / No | Yes / No |                                    |                                     |
| Nitrate      |      |       |        |                         | Yes / No | Yes / No |                                    |                                     |
| Temperature  |      |       |        |                         | Yes / No | Yes / No |                                    |                                     |
| Phosphate    |      |       |        |                         | Yes / No | Yes / No |                                    |                                     |
| Trace metals |      |       |        |                         | Yes / No | Yes / No |                                    |                                     |

**PLEASE COPY AND FILL IF THERE ARE MULTIPLE STATIONS, Please provide a map of the monitoring stations, if any**

## Section 2.2: Ocean nutrient, trace metal and biological monitoring

Ocean water nutrient, trace metal and biological analysis at Universities and research institutes should be reported in Table 2.

**Table 9: Ocean nutrient, trace metal and biological monitoring; Please add rows as necessary**

| Parameter     | Methods | Lat. | Long. | Height | Network/<br>institution | Scientist<br>in charge;<br>Email<br>address | Coastal? | Data<br>available<br>since<br>when |
|---------------|---------|------|-------|--------|-------------------------|---|----------|------------------------------------|
| Nutrients     |         |      |       |        |                         |   | Yes / No |                                    |
|               |         |      |       |        |                         |   | Yes / No |                                    |
|               |         |      |       |        |                         |   | Yes / No |                                    |
|               |         |      |       |        |                         |   | Yes / No |                                    |
| Trace metal   |         |      |       |        |                         |   | Yes / No |                                    |
|               |         |      |       |        |                         |   | Yes / No |                                    |
|               |         |      |       |        |                         |   | Yes / No |                                    |
|               |         |      |       |        |                         |   | Yes / No |                                    |
| Chlorophyll   |         |      |       |        |                         |   | Yes / No |                                    |
|               |         |      |       |        |                         |   | Yes / No |                                    |
|               |         |      |       |        |                         |   | Yes / No |                                    |
|               |         |      |       |        |                         |   | Yes / No |                                    |
| Phytoplankton |         |      |       |        |                         |   | Yes / No |                                    |
|               |         |      |       |        |                         |   | Yes / No |                                    |
|               |         |      |       |        |                         |   | Yes / No |                                    |
|               |         |      |       |        |                         |   | Yes / No |                                    |
| Zooplankton   |         |      |       |        |                         |   | Yes / No |                                    |
|               |         |      |       |        |                         |   | Yes / No |                                    |
|               |         |      |       |        |                         |   | Yes / No |                                    |
|               |         |      |       |        |                         |   | Yes / No |                                    |

### Section 2.3: Remote sensing

Please, specify the satellite sensor used to monitor/characterize marine parameters in your country. Please, contact the remote sensing institutes of your country in order to report on national capabilities.

Table 10: Satellite-borne observations; Please add rows as necessary

| Sensor | Product | Quantitative use (images)   | Quantitative use (data)     | Period since |
|--------|---------|-----------------------------|-----------------------------|--------------|
|        |         | Yes / No<br>Please specify: | Yes / No<br>Please specify: |              |
|        |         | Yes / No<br>Please specify: | Yes / No<br>Please specify: |              |
|        |         | Yes / No<br>Please specify: | Yes / No<br>Please specify: |              |
|        |         | Yes / No<br>Please specify: | Yes / No<br>Please specify: |              |
|        |         | Yes / No<br>Please specify: | Yes / No<br>Please specify: |              |
|        |         | Yes / No<br>Please specify: | Yes / No<br>Please specify: |              |
|        |         | Yes / No<br>Please specify: | Yes / No<br>Please specify: |              |
|        |         | Yes / No<br>Please specify: | Yes / No<br>Please specify: |              |
|        |         | Yes / No<br>Please specify: | Yes / No<br>Please specify: |              |

Is there in your country a specialized centre for satellite data reception that can be useful for ocean study? (Yes / No)

If so please describe and provide contact details of scientist in charge.

## Section 2.4: Analytical capacity of marine biogeochemical parameters

Analytical capacity of marine biogeochemical parameters at Universities and research institutes should be reported in Table 5.

**Table 11: Analytical capacity related to marine biogeochemical parameters**

| Parameters                               | Analytical instruments | Institution | Scientist in charge |
|--|------------------------|-------------|---------------------|
| Trace metals                             |                        |             |                     |
| Nutrients: Nitrate, phosphorus, ammonium |                        |             |                     |
| Chlorophyll                              |                        |             |                     |
| Phytoplankton                            |                        |             |                     |
| Zooplankton                              |                        |             |                     |



**Table 13: Main features of your aerosol/dust model**

|                              |  |
|------------------------------|--|
| <b>Model</b>                 |  |
| <b>Institution</b>           |  |
| <b>Meteorological Driver</b> |  |
| <b>Geographical Domain</b>   |  |
| <b>Horizontal Resolution</b> |  |
| <b>Vertical Resolution</b>   |  |
| <b>Transport size Bins</b>   |  |
| <b>Data assimilation</b>     |  |
| <b>Other features</b>        |  |

## **Section 2.6 Additional Information**

**Please use this section to add any information which can be useful but not included in the questionnaire. This section can be used to comment on the questionnaire itself.**