

Joint European Research Infrastructure network for Coastal Observatories



Summer School 1 D6.3 & Milestone 20

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1. Document Description



REFERENCES

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2. Introduction



In Europe, marine research and technology underpin the competitiveness of the industry and service sectors. Society needs to invest in human resources and infrastructure to advance marine sector development against a background of the rising industrialisation of Europe's seas and oceans. European seas are experiencing increasing human impact; for example from renewable energy provision, aggregate extraction, fishing and leisure industries. The goal is for sustainable development, which means protecting the marine ecosystem, minimising the impacts of climate change, natural hazards and anthropogenic influences, whilst maximising benefits to society. Marine environmental policies, management of marine resources, coastal planning and marine operations should support sustainable development. Managers need to adopt an integrated approach in order to make the best informed decisions. Good management and decision support systems rely on the timely delivery of routine, reliable, quality-assured marine data. Finding innovative solutions that meet the sustainable development challenge stimulate the economy and at the same time protect our environment is clearly beneficial.

Operational oceanography is defined as '*systematic and long-term routine measurements of the seas and oceans and atmosphere, and the rapid interpretation and dissemination of information*'. Operational oceanography is evolving towards the provision of integrated, service-oriented applications, which are essential for the needs of a knowledge-based society. Marine observing systems are being set up in European coastal seas to meet a range of different requirements; policy, research, operation and for industry. A key requirement from marine observing systems is the provision of reliable, high-quality and comprehensive measurements over long time periods. These are provided through the use of multiple observing platforms that include ships, automated platforms and sensors systems. In-situ observations, combined with remote sensing and numerical modelling techniques, help detect, understand and forecast the most crucial coastal processes, over extensive areas. The JERICO project aims to create a network of European coastal marine observatories that integrate a range of observational systems such as moorings, drifters, ferrybox and gliders. The project also identifies best practices for design, implementation, maintenance and distribution of data from coastal observing systems, as well as setting quality standards.

The advent of multi-disciplinary, spatially widespread, long term and real-time marine data and information is triggering an unprecedented leap in the economic value of ocean data. Marine data, information and knowledge are essential for managing marine resources efficiently and are of benefit to industry and the services sectors, for example marine transportation, safety and public health. The future will require multiple-purpose observing systems, linking marine data to economic, environmental and social domains. Such systems cater not only for monitoring, but also for research, service provision, security, safety and for policy purposes. This is critical to competitiveness, product development and enhancement of services, and will help implement the EU integrated maritime policy.

The purpose of the first JERICO summer school was to invest in human resources, through training, knowledge exchange and sharing of expertise in operational oceanography.

3. JERICO summer school



3.1 Focus of the Course

Operational oceanography in the coastal seas was the focus of this summer school. It dealt with technical and theoretical aspects related to metocean observations, operational monitoring platforms, numerical modelling and forecasting, data quality control and management, data assimilation and assessments, data archiving and dissemination. Other aspects included downstream services, applications and links to a wide range of users. The school provided participants with an overview of coastal observatories and European operational oceanography, now and in the future. Students were introduced to state-of-the-art methods and tools of operational oceanography across inter-related disciplines from physics to ecology, and over wide geographic scales. They experienced how this links to data acquisition and forecasting systems, and to managing sustainable development for scientific and socio-economic purposes.

3.2 Part Objectives

Apart from introducing students to the above mentioned content, the summer school also helped bring interested parties together to learn about JERICO, to link to its activities and network, and to promote coastal observatories. It is expected that the school participants will stay in contact after the course, which will encourage future collaboration joint efforts. The school provided room for participants to share experiences and learn best practices. Also in the future they will be able to contribute to future operational oceanography for the timely, continuous and sustainable delivery of high quality environmental data and information products related to the marine environment of European coastal seas.

3.3 Participant selection process

The applications for the JERICO Malta Summer School were open from the 1st of February 2013 up to the 30th of April 2013. Interested applicants had to complete and send an official application, a letter of recommendation, a covering letter expressing their interest in the school as well as their curriculum vitae. A total of 83 applications were received. In the application form, prospective students indicated their past experience in similar courses, whether they had been awarded a scholarship before and the financial support requested from JERICO (for travel, accommodation and subsistence allowance) to attend this school.

Nineteen of the received applications did not require any funding support so they were accepted without any adjudication. A dedicated Steering Committee was set up to evaluate the applications that required sponsorship. This board was made of the members shown in Table 1. All of the received documents were stored in folders according to 'county of residence' and shared with the members of the board for evaluation. Marks were allocated according to the applicants' qualifications, work experience in operational oceanography, their ability to increase the impact of JERICO and the level of support of the course to applicant's career. The marks from all members of the Board were collected and the average was determined. Points related to the person making the recommendation as well as the applicant's geographical location were added to the scores to get the final global mark for ranking. Sixteen participants (11 of whom required full sponsorship and five required partial sponsorship) were selected.

3. JERICO summer school



Thirty-five applicants were chosen to participate in the JERICO Malta Summer School. Seventeen students were male and 18 were female. A modicum of equitability in terms of geographical representation was maintained. Attendees were from 17 different countries as follows: Belgium (1), Croatia (1), Finland (1), France (1), Germany (1), Ireland (1), Italy (9), Malta (2), Norway (1), Poland (2), Portugal (3), Romania (2), Slovenia (2), Spain (3), Tunis (1), UK (3), and Ukraine (1). The large number of participants from Italy was due to the fact that self-supported candidates (i.e. candidates who did not request financial support) were accepted without being considered in the evaluation exercise.

Table 1: JERICO Summer School Steering Committee

Name	Affiliation
Patrick Farcy	IFREMER
David Mills and Jo Foden	Cefas
Fedor Baart	DELTARES
Stefania Sparnocchia	ISMAR-CNR
Marco Zavatarelli	CONISMA
Aldo Drago and Adam Gauci	University of Malta

4. Promotion and Dissemination



In the months before the course, the Summer School as well as the JERICO Project was promoted as much as possible (Figure 1). The most intensive promotional period was in April 2013 when the applications were being accepted.

A dedicated course flyer was created (Figure 2) and widely disseminated through email. A dedicated website was also set up for the course and can be accessed from www.capemalta.net/jerico/maltaschool. This served as a portal from where interested participants could get more information and download the required forms. Eventually, a password-restricted participants' area was also set up to disseminate the course content to the participants.



Figure 1: Screen shot of the course website (www.capemalta.net/jerico/maltaschool)

4. Promotion and Dissemination






**The JERICO
Malta Summer School**

www.capemalta.net/jerico/maltaschool

**Operational Oceanography
in the 21st Century
The Coastal Seas**

8th to 13th July 2013
UNIVERSITY OF MALTA








SCHOOL HIGHLIGHTS

- Operational Oceanography Overview
- Coastal Observatories
- Data Management
- Numerical Modelling Techniques
- Applications
- Visit to HF radar site



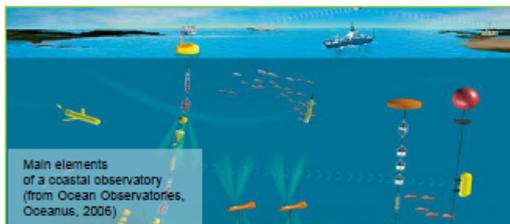
The school is organised by the Physical Oceanography Unit of the IOI-Malta Operational Centre at the University of Malta and will be held at the University Campus.

The planning of the school is done jointly with the Centre for Environment, Fisheries and Aquaculture Science (CEFAS).

Participation is free of charge. Visit the school website for more information and details on how to apply.

Deadline for application:
15 April 2013





Main elements of a coastal observatory (from Ocean Observatories, Oceanus, 2006)

Operational oceanography in the coastal seas is the focus of this summer school. It will deal with technical and theoretical aspects related to meteocean observations, operational monitoring platforms, numerical modelling and forecasting, data quality control and management, data assimilation and assessments, data archiving and dissemination. Other aspects include downstream services, applications and links to a wide range of users. The school will provide participants with an overview of coastal observatories and European operational oceanography, now and in the future. Students will be introduced to state-of-the-art methods and tools of operational oceanography across inter-related disciplines from physics to ecology, and over wide geographic scales. They will experience how this links to data acquisition and forecasting systems, and to managing sustainable development for scientific and socio-economic purposes.

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Physical Oceanography Unit
IOI-Malta Operational Centre
University of Malta
Msida MSD 2080, MALTA

Figure 2: Dedicated course flyer

4. Promotion and Dissemination



Articles to promote the site were also uploaded on the main JERICO website (<http://www.jerico-fp7.eu/malta-summer-school>), on the University of Malta's website (http://www.um.edu.mt/events/notices/archive/summer_school_on_operational_oceanography_in_malta) as well as on the news section of the PO-Unit website (<http://www.capemalta.net>) (Figures 3 and 4). The summer school was also advertised by different JERICO partner institutes, e.g. Cefas intranet.

The screenshot shows the JERICO website interface. At the top is a banner with the JERICO logo, a satellite, a buoy, and a ship. Below the banner is a navigation menu with links: Home, About, Partners, TNA, Oceanboard, Datatools, Contact. The main content area features a sidebar on the left with categories like Project, Oceanboard, and Datatools. The central article is titled 'Successful JERICO Summer School in Malta' and describes a 35-participant event. It includes a photo of a lecture and a 'Follow the Glider' banner. The right sidebar contains a login form, an events calendar, and a news section.

Figure 3: Promotion of the JERICO Summer School on the main JERICO website

4. Promotion and Dissemination



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L-Università ta' Malta

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Events

Summer School on Operational Oceanography in Malta (8-12 Jul.)

Home > Summer School on Operational Oceanography in Malta (8-12 Jul.)

The Physical Oceanography Unit of the IOI-Malta Operational Centre at the University of Malta is making the final preparations to hold an international summer course on applied oceanography in the week 8 to 12 July 2013. The planning and coordination of the course is done by Prof. Aldo Drago jointly with the Centre for Environment, Fisheries and Aquaculture Science (CEFAS), and is funded by the FP7 JERICO project with additional support by MyOcean and the International Ocean Institute.

The JERICO Summer School is a quality professional course with 13 high profile foreign lecturers delivering applied and hands-on expertise in operational oceanography with a focus on coastal domains. There was a high demand for the course and a record number of 83 applicants worldwide applied. After a lengthy selection process 35 students have been now confirmed to attend.

Operational oceanography in the coastal seas is the focus of this summer school. It will deal with technical and theoretical aspects related to meteocean observations, operational monitoring platforms, numerical modelling and forecasting, data quality control and management, data assimilation and assessments, data archiving and dissemination. Other aspects include downstream services, applications and links to a wide range of users. The school will provide participants with an overview of coastal observatories and European operational oceanography, now and in the future. Students will be introduced to state-of-the-art methods and tools of operational oceanography across inter-related disciplines from physics to ecology, and over wide geographic scales. They will experience how this links to data acquisition and forecasting systems, and to managing sustainable development for scientific and socio-economic purposes.

Further information on the JERICO Malta Summer School can be accessed [online](#).

The JERICO project aims to create a network of European coastal marine observatories that integrate a range of observational systems such as moorings, drifters, ferrybox and gliders. The project is also identifying best practice for design, implementation and maintenance of coastal observing systems, as well as promoting improved distribution of data and setting quality standards.

This summer school is a precursor to a Masters Course in Applied Oceanography that the PO-Unit of the University of Malta is launching next October.

Figure 4: Promotion of the JERICO Summer School on the University's of Malta website

5. Summer school programme



3.4 Course Coordination and Programme

The design of the summer school course programme was led by Aldo Drago (University of Malta), in consultation with Jo Foden (Cefas). Initial approaches to potential lecturers were made by Dr Foden at the Jerico General Assembly in Crete, October 2012. Prof. Drago led the dialogue with the lecturers during an intense period leading up to the summer school, in order to coordinate the programme into a coherent whole. Prof. Drago's team at the University of Malta dedicated their time to organising and planning the logistics of the course including: the computer laboratory; providing software; participants' folders and information; accommodation; facilities; finances; transport; and the social programme.

For the duration of the summer school Dr Foden was course coordinator. This involved ensuring the smooth running of the programme and being the main point of contact for both lecturers and participants. Dr Foden was given excellent support by Adam Gauci, Angele Giuliano and other staff of the IOI-Malta Operational Centre.

The summer school covered a broad range of coastal operational oceanography topics in a series of lectures and hands-on practicals. The following provides an overview of these topics as they were delivered each day.

Day 1 Morning (09:00 – 12:30)

Overview on Operational Oceanography

- Introduction to the school (*Aldo Drago – Course Coordinator, PO-Unit, UOM*) – 15min
- The science of ocean predictions and operational oceanography in the XXI century - European Vision on Operational Oceanography (*Nadia Pinardi – INGV*) – 50min
- Basic concepts in Operational Oceanography: From data to knowledge with a focus on the coastal seas (*David Mills - Cefas*) – 50min
- International cooperation and governance in Operational Oceanography (*Glenn Nolan – Marine Institute, Ireland*) - 35min
- The customer base for Operational Oceanography(*Glenn Nolan – Marine Institute, Ireland*) – 35min

Day 1 Afternoon (13:30 – 17:00)

Coastal Observatories

- Concept of coastal observatories and the JERICO project (*Glenn Nolan – Marine Institute, Ireland*) – 50min
- Marine Observatories and Infrastructure – the COSYNA experience (*Wilhelm Petersen – HZG, Institute of Coastal Research, Germany*) - 45min
- Marine Sensors (*Rajesh Nair - OGS*) - 50min

5. Summer school programme



- Sensors and systems for navigation and tracking (*Glenn Nolan – Marine Institute, Ireland*) - 45min

Day 2 Morning (09:00 – 12:30)

Coastal Observatories

- Fixed Platforms (*Rajesh Nair - OGS*) - 45min
- Ferryboxes (*Wilhelm Petersen – HZG, Institute of Coastal Research, Germany*) - 50min
- Underwater wired and wireless systems; Unmanned underwater exploration (gliders, ROVs) (*Glenn Nolan – Marine Institute, Ireland*) - 50min
- Calibration, qualification and the JERICO label (*Rajesh Nair - OGS*) - 45min

Day 2 Afternoon (13:30 - 17:00)

Hands-on session

- The MyOcean Project: Delivering the Marine Core Service (*Sylvie Poliquen – IFREMER, Member of the MyOcean Project*) – 1hr
- Discovery, Viewing, Downloading and use of data from the MyOcean online service (*Andreas Nikolaidis – OC-UCY, Member of the MyOcean Project*) – 2hr 10min

Day 3 Morning (09:00 - 12:30)

Numerical Modelling Techniques

- Concept of predictability in oceanography; Concept of parameterisation (*Srdjan Dobrocic – CMCC*) – 1hr
- Numerical modelling of the marine environment: from physical processes to ecosystem functioning – Part 1 (*Marco Zavatarelli – CONISMA*) – 1hr 10min
- Introduction to data assimilation (*Srdjan Dobrocic – CMCC*) – 1hr

Day 3 Afternoon (13:30 - 17:00)

Numerical Modelling Techniques

- Numerical modelling of the marine environment: from physical processes to ecosystem functioning – Part 2 (*Marco Zavatarelli – CONISMA*) – 1hr 50min
- Models for engineering (*Fedor Baart – DELTARES*) – 1hr 20min

5. Summer school programme



Day 4 Morning (09:00 – 12:30)

Data Management

(Fedor Baart – DELTARES and Sylvie Poliquen –IFREMER, Member of the MyOcean Project)

- Data exchange – Progress in the past ten years – 15 min
- IODE, EMODNET and SeaDataNet – 30 min
- QC in delayed and real time modes – 50min
- Data formats and archiving – 40 min
- Use of climatological data – 15 min
- Data mining and Web services – 40 min

Day 4 Afternoon (13:30 – 17:00)

Hands-on session

(Fedor Baart – DELTARES and Joel Azzopardi, Adam Gauci - PO-Unit, UoM)

- Visualisation and analysis techniques of time series data
- Exercises in QC, formats and management of ocean data

Day 5 Morning (09:00 - 12:30)

Applications

- Introduction to applications and downstream services (*Jo Foden – Cefas on behalf of Glenn Nolan – Marine Institute, Ireland*) – 25min
- Applications in maritime transport, security, safety and pollution - Oil spill modelling: The MEDSLIK experience (*George Zodiatis – OC-UCY, Member of the MyOcean Project*) – 55min
- Applications in coastal engineering - The DELFT3d modelling experience (*Fedor Baart – DELTARES*) – 55min
- Applications in marine environmental monitoring and assessments - The European Marine Ecosystem Observatory (*Jo Foden - Cefas*) – 55min

Day 5 Afternoon (13:30-17:00)

Hands-on session

- Using satellite and model data for environmental assessments and protection - Practice on oil spill modelling (*Xenia Panayidou – OC-UCY, Member of the MyOcean Project and Adam Gauci - PO-Unit, UoM*) – 1hr 50min
- Demo on EMECO (*Jo Foden – Cefas*) – 1hr 20min

Day 6 Excursion (09:30 – 15:00)

- Site visit to HF radar in Malta

6. Evaluation



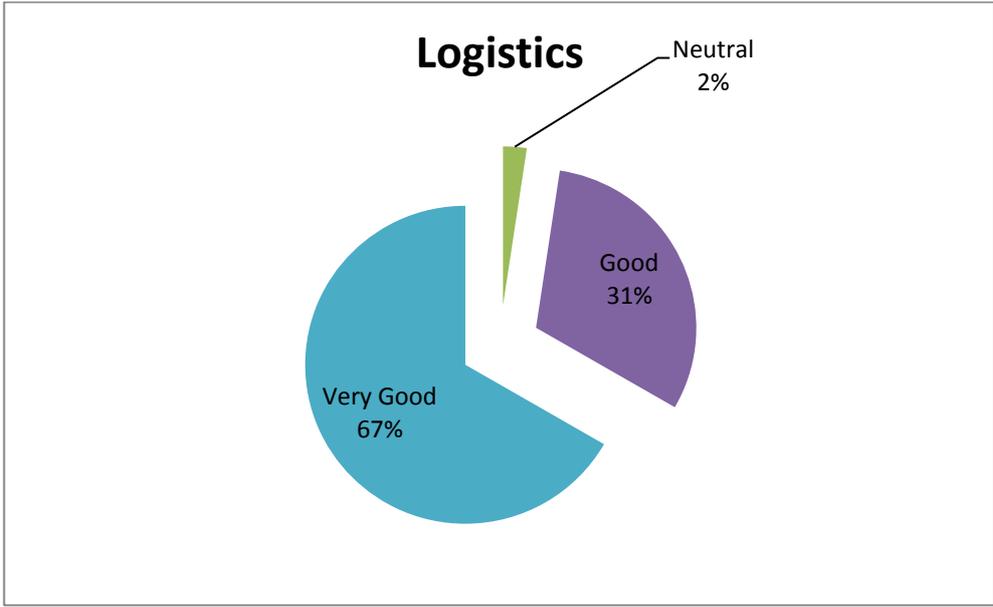
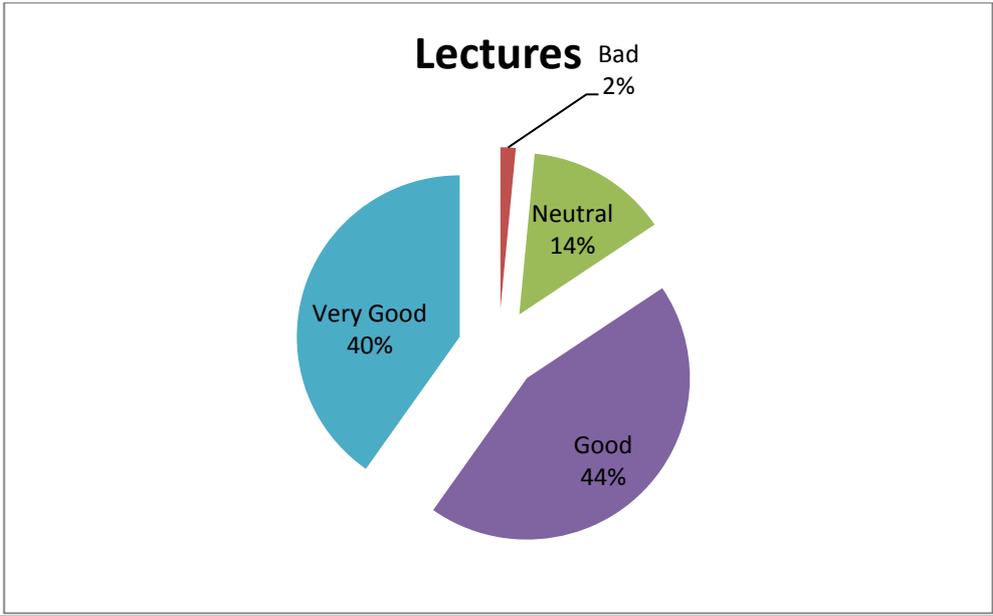
Course participants who consistently attended the course sessions were presented with certificates during a brief ceremony at the end of the course.

The academic relevance, delivery of the summer school and the participants' general experience were evaluated by means of a short questionnaire, completed on a voluntary basis by participants. A copy of the evaluation form is attached as Appendix A. The evaluation was based on four main aspects: (1) the quality of the lectures and the relevance to the participants' field of research, (2) the course logistics, (3) the accommodation, and (4) the social programme. In each case the evaluation was a five-point scale ranging from very bad to very good. Results have been collated in Table 2 and the graphics that follow collate the results for each aspect of the summer school experience.

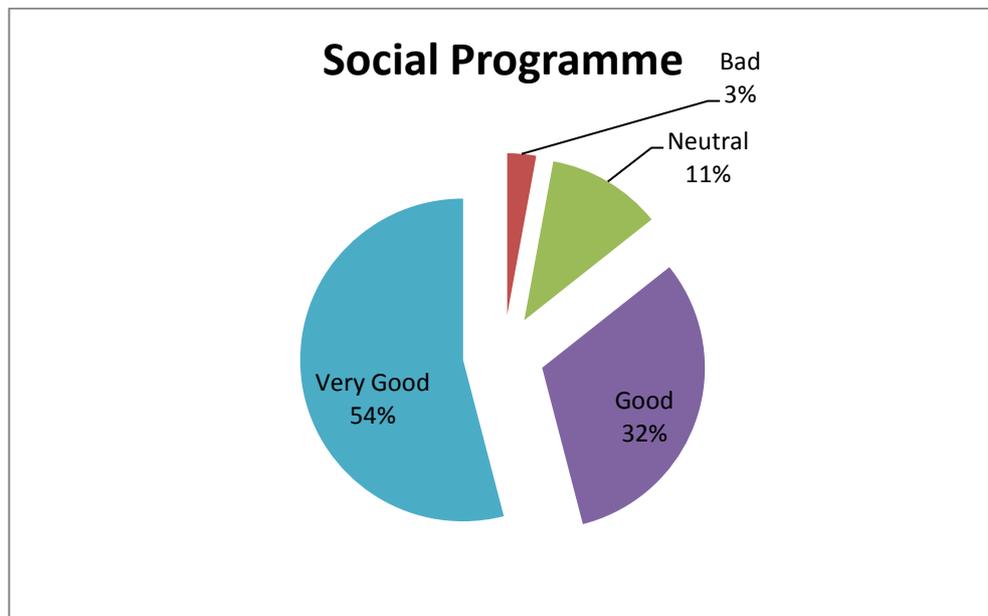
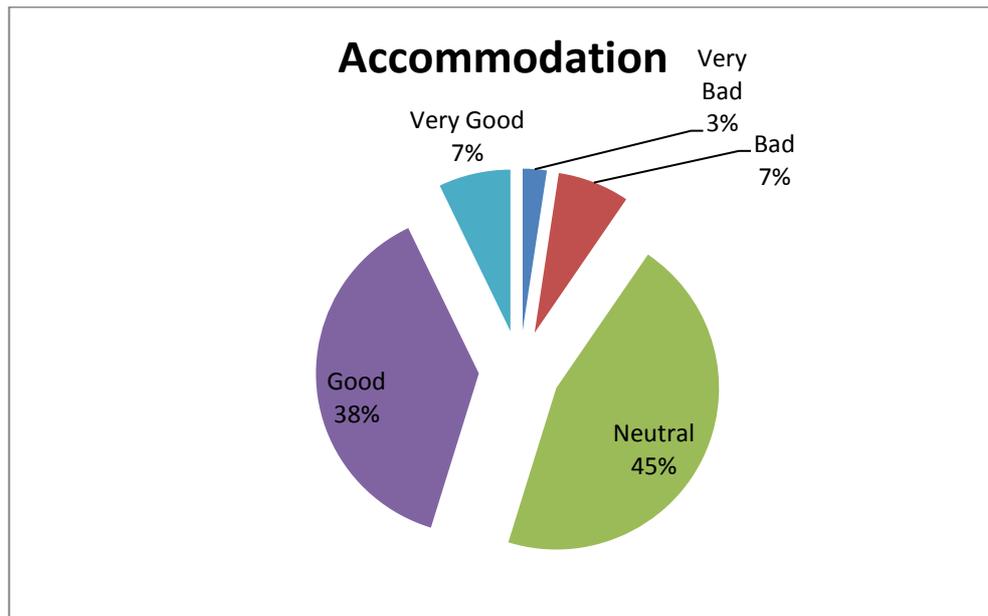
Table 2: Questionnaire responses

Aspect of the summer school experience	Very Bad (%)	Bad (%)	Neutral (%)	Good (%)	Very Good (%)
1. Lectures Lecture concept and presentation	0	2	13	41	44
1. Lectures Relevance to your field	0	1	16	47	36
2. Logistics Lecture room	0	0	0	43	57
2. Logistics Computer lab facilities	0	0	7	21	71
2. Logistics Support from the course organisers	0	0	0	29	71
3. Accommodation Facilities	0	7	57	36	0
3. Accommodation Overall convenience	0	7	50	36	7
3. Accommodation Location	7	7	29	43	14
4. Social Programme Ice breaking get together	0	0	14	29	57
4. Social Programme Dinner	0	7	29	21	43
4. Social Programme Coffee breaks	0	7	14	36	43
4. Social Programme Radar site visit	0	0	0	36	64
4. Social Programme Cultural tour	0	0	0	36	64

6. Evaluation



6. Evaluation



The participants had strongly positive opinions about the JERICO Malta summer school. Positive scores were given for all six criteria. The participants were also given the opportunity to write any additional comments in each section, which are reproduced below.

6. Evaluation



Additional Participant comments:

- “I learnt many different things in this course. I liked also the exchange of experiences with other participants. It was a very good experience!!!”
- “Thanks to Jo we did not waste any minute!”
- “The only major thing missing was an introduction by all participants stating their background and research interests. This would have been very helpful in terms of targeting people who were working in the same research area and/or geographic location. I would definitely recommend this for future courses.”
- “Excellent course that gave me a great insight into areas of observational oceanography which I was not familiar with (modelling etc.). Really well organised, great speakers and great itinerary. Would like to extend thanks to all organisers and speakers for an excellent job. Many thanks!”
- “Not only had I had the chance to learn and have discussions with top scientist in the field of study, as I found a very interesting group of people working in the same field”
- “I think that the practical sessions should be exposed more slowly so that everyone can follow. Maybe the lecturers should offer less exercises but explaining them better (I am referring to Baart Fedor and Panayidou Xenia). I really appreciated Nadia Pinardi’s lecture: even if the topics were difficult she explained everything in a very simple way for understanding.”
- “The concept of the course was well structured, the only thing that should be improved is work on exercises (hands-on sessions), sometimes it seemed that so many things wanted to be done in a short time and it was hard to keep up. I believe that exercises should be more focused, even if reduced in number.”
- “Triple A for social programme and hospitality. Having in mind that the course was relatively short and intense, we really had time to discuss, talk, have fun and learn. And to enjoy Maltese hospitality and food etc. Thanks again for all that.”
- “The social activities are great. Maybe coffee break could be better in quality of fresh food provided, but the sociality was good. The dinner was not so good in terms of quality of food and location. Radar visit and cultural tour were really nice. Maybe could be time-scheduled better (too warm to visit the town at lunch time).”

7. Next steps



In 2014 there will be a 2nd Jerico Summer School, hosted by DELTARES in The Netherlands. Links have already been made between the two summer schools. For example, Fedor Baart from DELTARES lectured and delivered practical sessions in the 1st summer school. He also took the opportunity to advertise the 2nd school to the participants. The topic of the DELTARES summer school will be the 'Fourth Paradigm', data intensive scientific discovery and work flows to turn data into information. The key features of the Fourth Paradigm are:

- 4th paradigm is data-centric science
- Currently EU infrastructures try to deliver data to end-users (algorithms)
- But the data become so big end-users cannot store it any more
- Near-future end-users want their algorithms to go to the data
- Moving algorithms to centrally stored data will allow sharing algorithms
- Workflow communities are the future

The intention is to concentrate on one workflow a day, with hands-on exercises. For example:

- OpenDA (www.openda.org) – Martin Verlaan, Ghada El serafy
open source data assimilation toolbox (Java)
- OpenEarth (www.OpenEarth.eu) – Fedor Baart, Gerben de Boer
open source data processing toolbox (Matlab, Python, R)
- EMECO (www.emecogroup.org)
open source workflow
- DINEOF/DIVA (<http://modb.oce.ulg.ac.be/mediawiki/index.php/DINEOF>)
open source empirical orthogonal function toolbox (Fortran)

Apart from the academic programme, the organisation team planned a number of activities to allow the lectures and students to socialize in an informal environment. This provided the opportunity for the professionals and young participants to meet, make new friends and exchange ideas. For all such events, transport was organised so that the visitors did not have to waste time planning their trips.

8. Social programme



4.1 Ice-Breaker Event

On Tuesday the 9th of July all participants and lecturers were invited to a get-together next to the pool area of their place of residence. Drinks and some finger foods were served. This was planned on the second day of the course to ensure that all participants had sufficient time to settle in and rest after their travel. As indicated by the feedback in the evaluation forms, the event was very successful and everyone enjoyed the time together.



Figure 5: Participants during the ice breaker social event

8. Social programme



Figure 6: Participants during the ice breaker social event



Figure 7: Participants during the ice breaker social event

8. Social programme



Figure 8: Participants during the ice breaker social event



Figure 9: Participants during the ice breaker social event

8. Social programme



4.2 Social Dinner

On Thursday 11th July a dinner for all participants was organised at a restaurant serving local food. The menu was set to cater for everyone including vegetarians and vegans.



Figure 10: Participants during the social dinner

8. Social programme



Figure 11: Participants during the social dinner



Figure 12: Participants during the social dinner

8. Social programme



4.3 Excursion

On Saturday 13th July a whole day exertion was organised. The bus left the residence at 09:30 and took the participants to the HF Radar site which was recently set up and is maintained by the PO-Unit. Mr Adam Gauci gave an explanation of the technologies involved and the students could see the electronics and actual radar mast. The bus then took everyone to Mdina for a tour of Malta's old city as well as to Golden Bay. A tour guide was hired for the entire day to explain and give historical facts of the places visited.



Figure 13: Excursion HF Radar site visit

8. Social programme



Figure 14: Excursion tour of Mdina



Figure 15: Excursion tour of Mdina

9. Lecturers



	NIKOLAIDIS Andreas	
	Office	Oceanography Center of University of Cyprus
	E-mail	nikolaidis.andreas@ucy.ac.cy
	Bio Note	Andreas Nikolaidis is a researcher in Oceanography Center of University of Cyprus, with more than twenty years experience in marine and computer sciences as a former civil servant of the Hellenic Navy Hydrographic Service. He holds a Master of Science in Coastal Management, specialized in Physical and Operational Oceanography. He has professional qualifications in the field of computer programming, with additional specialization in Computer Networks, and GIS and with International teaching competence.

	MILLS Dave	
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9. Lecturers



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	FODEN Jo	
	Office	UK's Centre for Environment, Fisheries and Aquaculture Science (Cefas)
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Bio Note	<p>Dr. Jo Foden is a marine ecosystem scientist at the UK's Centre for Environment, Fisheries and Aquaculture Science (Cefas), which is a UK government agency. One of her main research interest includes investigating the cumulative impacts of human activities on the marine environment. Her work involves assessing the condition of the marine environment, particularly eutrophication, and reporting for UK policy commitments such as OSPAR and EU Directives. She is also involved in developing ecosystem observatories for addressing science, policy and industry needs and represents the UK at OSPAR and MSFD working groups.</p>	

	PINARDI Nadia	
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Bio Note		

9. Lecturers



	ZAVATARELLI Marco	
	Office	Physics and Astronomy Department and at the Interdepartmental Centre for Environmental Sciences of the Bologna University
	E-mail	marco.zavatarelli@unibo.it
	Bio Note	Prof. Marco Zavatarelli is a research member of staff of the Department of Physics and Astronomy as well as at the Interdepartmental Centre for Environmental Sciences of the Bologna University. The focus of his doctorate degree is in the Marine Environmental Sciences. He occupied various research positions at Princeton University (USA), the Danish Hydraulic Institute-Ecological Modelling Centre (DK), and the International Institute for applied Systems Analysis and the National Research Council. His main scientific activity is in the field of numerical modelling of the ocean, general circulation and ecosystem dynamics. Prof. Zavatarelli has participated in several EU funded projects mainly concerned with circulation and ecosystem dynamics. He is an author of more than 30 internationally peer-reviewed papers, with more than 600 citations.

	POLIQUEN Sylvie	
	Office	Department of Oceanography from Space, IFREMER
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	Bio Note	Dr. Sylvie Pouliquen is the head of the Coriolis inter-agency structure within the IFREMER Department of Oceanography from Space. This coordinates in-situ data collection for Operational Oceanography. The Coriolis Data Centre together with the US Godae server is one of the two Global Data Centres for the Argo Program. She graduated from the Institut National des Sciences Appliquées in 1982. Dr. Pouliquen also chairs the Argo Data Management Team which is in charge of setting up the Argo data network and coordinates the in-situ work package in the MyOcean and MyOcean2 GMES Marine Core Service. She also manages the glider data management activities within the GROOM FP7 project.

9. Lecturers



	NAIR Rajesh	
	Office	Division of Oceanography, OGS (Istituto Nazionale di Oceanografia e di Geofisica Sperimentale), Italy
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	Bio Note	Mr. Rajesh Nair is a member of the permanent staff of the Centro di Taratura Oceanografica (CTO), the oceanographic calibration facility of the OGS (Istituto Nazionale di Oceanografia e di Geofisica Sperimentale), an Italian public sector research institute operating in different spheres of the Earth Sciences. He has over 20 years of experience in Oceanography and the Marine Sciences, with a strong experimental background, extensive field skills and “hands-on” knowledge of a wide variety of marine instrumentation. His present activities and interests focus on marine observing technologies, including calibration, control and testing of instrumentation, and the application of metrological principles to measurement quality assurance both in the laboratory and in the field. Mr. Nair has participated in various EU and Italian national projects involving the marine sector, and is currently coordinating the activities of the OGS in the EU FP7 project “JERICO (Towards a Joint European Research Infrastructure Network for Coastal Observatories)” and the EMRP (European Metrology Research Programme) project “ENV05-OCEAN: metrology for ocean salinity and acidity”.

9. Lecturers



	PETERSEN Wilhelm	
	Office	Helmholtz-Zentrum Geesthacht, Institute of Coastal Research
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	Bio Note	Dr. Wilhelm Petersen is the head of the group "In Situ Measuring Systems" at the Institute of Coastal Research/Operational Systems at Helmholtz-Zentrum Geesthacht, Germany. His research interests and expertise include: analytical chemistry, development of analytical methods and instruments for the detection of aquatic substances, statistical analysis of time series of water quality data, investigations on the behaviour of phytoplankton in the marine environment and in studies of biogeochemical processes, development of automatic and remote-controlled measuring systems for the determination of environmental parameters and contaminants in coastal waters on fixed stations and ships of opportunity. Dr. Petersen participated in several EU projects and recently became a member of the steering committee and leader of WP3 ("Harmonizing technological aspects") in the FP7 infrastructure project JERICO.

	PANAYIDOU Xenia	
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	Bio Note	Mrs. Xenia Panayidou, is a special scientist at the Oceanography Centre University of Cyprus since 2006. She has a BSc degree in Computer Science from the University of Nicosia. She is involved in several EU and other research projects of the Oceanography Centre, such as MEDESS-4MS, ECOOP, MyOcean, PREMARPOL, etc, regarding the application of oil spill models using operational ocean forecasting data from the CYCOFOS-Cyprus Coastal Ocean Forecasting System. In addition, she carried out the training to users from response institutions of the MEDSLIK oil spill model software. She is participating on behalf the Oceanography Center in the Cyprus-National oil pollution response exercises – NIRIIS 2011 and 2012, providing the oil spill prediction scenarios. Mrs Panayidou, also involved in the daily processing of the remote sensing module of the CYCOFOS. She is a co-authors of numerous publications regarding the MEDSLIK oil spill modelling applications.

9. Lecturers



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	Bio Note	Dr George Zodiatis is the Vice Director of the Oceanography Center, University of Cyprus. Prior he worked at the Department of Fisheries and Marine Research, Nicosia, and at the Institute of Oceanography, National Centre for Marine Research (today known as Hellenic Center for Marine Research), Athens. Dr Zodiatis has more than 25 years of experience in oceanography of the Mediterranean Sea and he has been involved in more than 30 research projects funded by the EU, the Cyprus RPF and other organizations. He is coordinating the work of a team participating in projects related to oceanographic data and metadata management, operational oceanographic forecasting and observing systems, oil spill monitoring and prediction systems, etc. He is the chairperson of the Data Exchange Agreement of the Mediterranean Oceanography Network for Global Ocean Observing System and member of several organizations related to marine research in Europe. He has published more than a 100 refereed scientific and proceedings papers.

10. Participants



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10. Participants



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10. Participants



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10. Participants



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	Interests	I have a background in Oceanography, Water and Coastal Management, Numerical Modelling (hydrodynamics, water quality, pollution transport), and Ocean Conservation and Policy. I'm finish my PhD in the field of numerical modelling, where I've developed two operational systems for two high risk areas (Tuscany Archipelago (Italy) and the Algarve Coast (Portugal)) regarding oil pollution, based on a downscaling methodology. In parallel, I'm the co-founder of a consultancy company, SeaPulse (www.seapulse.pt),

10. Participants



	which focus its activities in the fields of numerical modelling, remote sensing, coastal dynamics and marine legislation.
--	---

	MIHAILOV Maria Emanuela	
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	Interests	PhD student at University of Bucharest, Faculty of Physics Department of Meteorology and Earth Physics Romania and scientist at National Institute for Marine Research and Development "Grigore Antipa" Constanta Romania. Experience in air-water-land pollution, radioactivity, atmosphere – sea interaction, seismology and atmospheric / pollution models, operational oceanography, ocean / marine physics that includes: analysis, modelling, evaluation the main physical processes in the Western Black Sea waters.

11. Appendix



APPENDIX 1 Evaluation Form

11. Appendix



**The JERICO
Malta Summer School**
www.capemalta.net/jerico/maltaschool

**Operational Oceanography
in the 21st Century
The Coastal Seas**

8th to 13th July 2013
UNIVERSITY OF MALTA

The banner also includes logos for the University of Malta, IOI (International Ocean Institute), PO UNIT, and Cefas.

TO ALL PARTICIPANTS OF THE COURSE

We would highly appreciate your feedback to assess the delivery of the course. Your comments on the academic content, delivery and organization of the course enable us to improve our performance in future similar events. Kindly complete this evaluation form and return it to us at your earliest convenience by hand before you leave or by email. Please note that any information given will be kept strictly confidential.

Thank you!

Course Secretariat
IOI-Malta Operational Centre
University of Malta

11. Appendix



1. Kindly rate quality of the lectures and their relevance to your field

LECTURE CONCEPT AND PRESENTATION	Very Bad	Bad	Neutral	Good	Very Good
Day 1 Morning					
Day 1 Afternoon					
Day 2 Morning					
Day 2 Hands-on session					
Day 3 Morning					
Day 3 Afternoon					
Day 4 Morning					
Day 4 Hands-on session					
Day 5 Morning					
Day 5 Hands-on session					
RELEVANCE TO YOUR FIELD	Very Bad	Bad	Neutral	Good	Very Good
Day 1 Morning					
Day 1 Afternoon					
Day 2 Morning					
Day 2 Hands-on session					
Day 3 Morning					
Day 3 Afternoon					
Day 4 Morning					
Day 4 Hands-on session					
Day 5 Morning					
Day 5 Hands-on session					

Were there any overlaps (repeated information) or gaps (what information was missing) in the course presentations? Did you find delivery inadequate or enlightening? Kindly submit your feedback on the overall course concept in the space provided:

11. Appendix



2. Kindly rate the course logistics (lecture room, Computer Lab facilities and general support from the course organisers)

	Very Bad	Bad	Neutral	Good	Very Good
Lecture room					
Computer Lab facilities					
Support from the course organisers					

Kindly submit your feedback on the overall course logistics in the space provided:

3. Kindly rate accommodation arrangements

	Accommodation options		Rating				
	SunDown Court	University Residence	Very Bad	Bad	Neutral	Good	Very Good
Accommodation facilities							
Overall convenience							
Location							

11. Appendix



Kindly submit your feedback on the accommodation in the space provided:

4. Kindly rate the social programme and hospitality

	Very Bad	Bad	Neutral	Good	Very Good
Ice-breaking get-together (9 th July)					
Dinner (11 th July)					
Coffee breaks					
Radar site visit					
Cultural tour					

What other activities would you have liked us to include? Kindly submit your feedback on the social programme and hospitality in the space provided:

11. Appendix



5. Other

Please add any other comments you wish to make including any remarks reflecting your personal experience of the course (impact on you, relevance to your career, etc)

