WERATLAS

Home Page

- Home
- Products
- Sample
- Links
- Purchase

WELCOME TO WERATLAS

EUROPEAN WAVE ENERGY ATLAS

The development of the European Wave Energy Atlas was partially funded by JOULE Programme – the European R&D Programme on Non-Nuclear Energies.

INETI
INSTITUTO NACIONAL DE ENGENHARIA, TECNOLOGIA E INOVAÇÃO

Heriot-Watt University
Edinburgh

OCEANOR

WERATLAS INFORMATION

TECHNICAL REPORT

WERATLAS INFORMATION

WERATLAS contains annual and seasonal (yearly, Winter and Summer) wave-climate and wave-energy statistics for a set of offshore locations distributed along the European coastline. It covers the North-eastern Atlantic Ocean, the North Sea, the Norwegian Sea, the Barents Sea and the Mediterranean Sea, the area being delimited by 49°W-45°E and 26.5°- 73°N. This major area is divided into five smaller zones which partially overlap. The information is presented at 85 data points, 41 in the Atlantic and 44 in the Mediterranean (here the spatial variability is higher and the wave information available on a finer grid). The majority of the selected data consists on results from WAM model (The WAMDI Group, 1988), a third-generation numerical wind-wave model that is in routine operation of the European Centre for Medium-Range Weather Forecasts, Reading, U.K. Measurements were used in areas were the accuracy of model results is questionable and high quality measurements are available.

WERATLAS is an user-friendly software for PC's running under WINDOWS. It enables the user to browse easily through the statistical information, and print and save it for further use.

The WAMDI Group, 1988, "The WAM model-a third generation wave prediction model", J. Phys. Oc., Vol. 18, 1775-1810.

DATA

- North-eastern Atlantic - Directional spectra computed six-hourly by the global WAM model for the period 1987-1994.
- North Sea - Directional buoy data and Plessey radar data for the period 1981-1994.
- Norwegian Sea and Barents Sea – buoy data (mostly directional) for periods between two and eight years.
- Mediterranean Sea – Mean wave parameters computed six-hourly by the Mediterranean WAM model for the period July1992-December1995.

The parameters considered are: H_s – significant wave height, T_e– mean (energy) period, T_p– spectral peak period , θ_m- mean direction and P_w- wave power or flux of energy per unit crest length.

A detailed verification of WAM results against measured buoy data and satellite (GEOSAT and Topex/Poseidon) altimeter data presented in detail in the Technical Report showed that:

- In the North Atlantic a very good agreement between estimates and measurements was found for all parameters. On average the model slightly underestimates all parameters, but a higher underestimation occurs for some strong storms.
- In the Mediterranean Sea the quality of WAM results is much lower than for the North Atlantic. The model underestimates H_s everywhere, the computed P_w values can be as low as 55% of the actual values. It was not possible to define a common correction coefficient for the whole area because a significant spatial variation of the underestimation factor is found. However, different H_s scaling factors for a number of sets of data points grouped according to their exposure to the predominant wave directions were proposed.

CONTENTS

Distribution of wave and wave-energy parameters

Tables

Long-term mean value and variation coefficient of P_w

Frequency table of H_s, T_e, T_p and θ_m

Exceedance table of P_w

Directional distribution of P_w

Bivariate frequency table of (H_s, T_e) and (H_s, T_p)

Plots

Probability density of H_s, T_e and T_p

Exceedance distribution of P_w

Distribution of θ_m

Directional distribution of P_w

Bivariate probability density of (H_s, T_e) and (H_s, T_p)

Seasonal and Interannual Variability

Plots of monthly mean value and confidence limits for H_s and P_w

The logNormal probability density function was fitted to the univariate H_s, T_e, T_p and P_w distributions. For the bivariate distributions (H_s, T_e) and (H_s, T_p), an analytical distribution (the Plackett model) was fitted and used for plotting the iso-probability curves.

SYSTEM REQUIREMENTS

Software: Windows 3.1x or later
Processor: PC 486/66MHz or above
Memory: 16 MB RAM
Display Resolution: 480x640, 256 colours
Printer: Laser or Inkjet Windows Compatible Printers
Hard disk space: 9 MB

ATLAS OPERATION

The information can be retrieved in global or local mode.
In *global mode* the wave power roses, wave roses and the gross (i.e. from all directions) power level for all the data points of the selected area are displayed. Tables containing the average power level, standard deviation and variation coefficient for each area are also available.
In *local mode* the statistics for a single point are presented in table and in graphical form. The fitted logNormal probability density distribution and its parameters are superimposed to the empirical univariate distributions. Several

statistics can be shown simultaneously on the screen.

USER'S GUIDE

The User´s Guide for WERATLAS, to be delivered with the software, summarises the Atlas background and describes in detail the Atlas operation.

TECHNICAL REPORT

The Technical Report provides the Atlas background and a detailed description of the work produced to developed WERATLAS. The abridged index below provides an overview of its contents.

INDEX:

WERATLAS

Home

Products

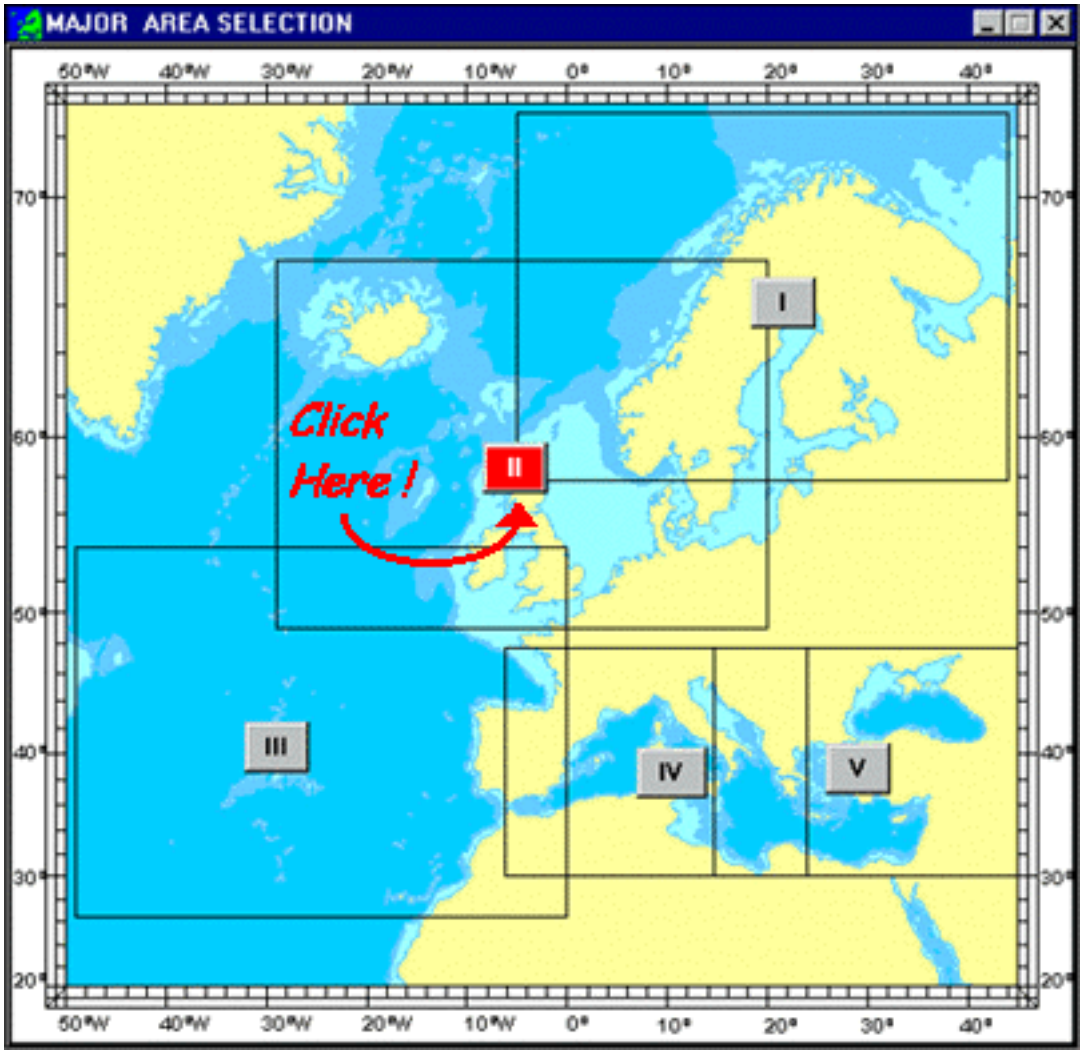
Sample

Links

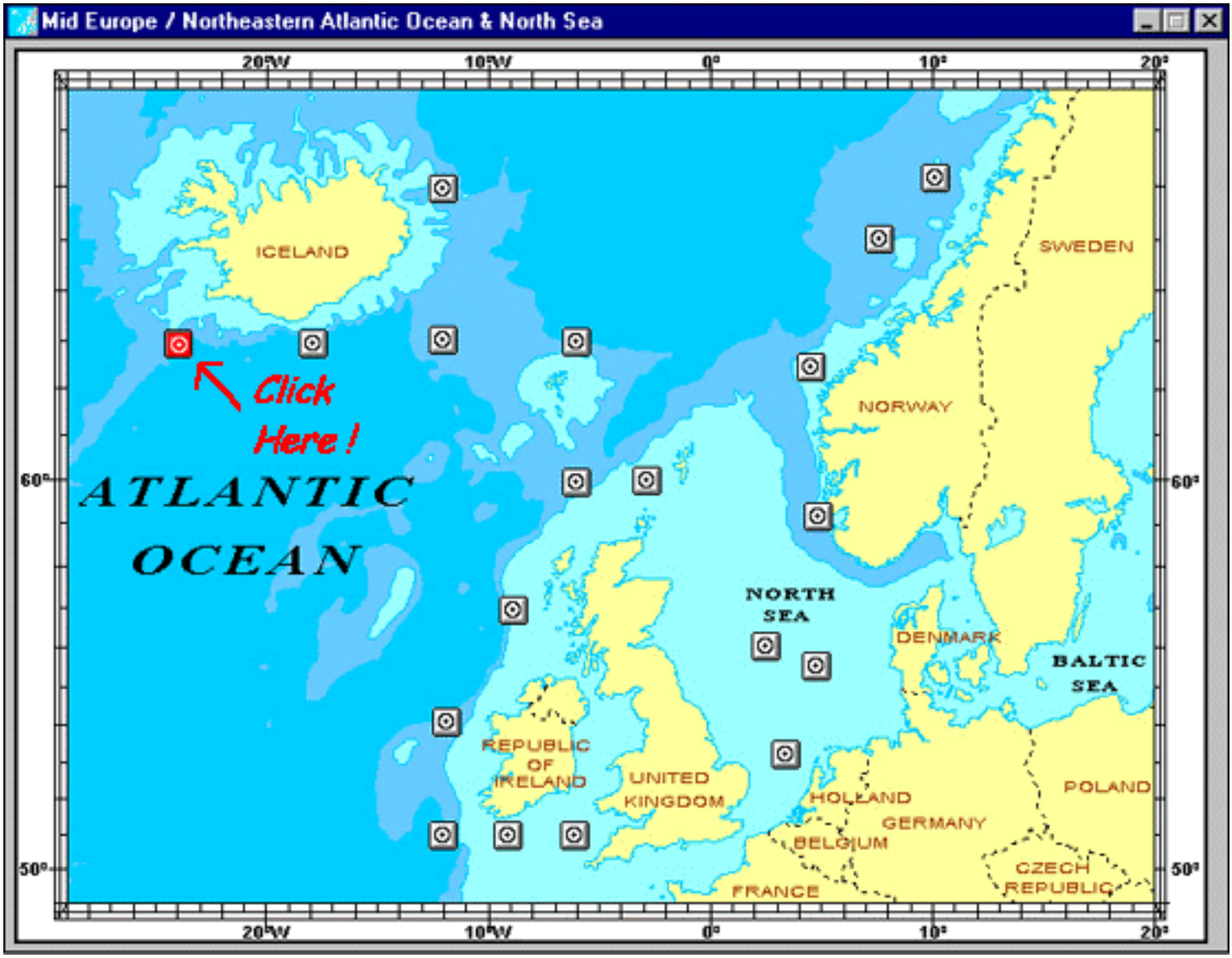
Purchase

Sample

This demo is just a sample of what you will get when you purchase the WERATLAS Software.

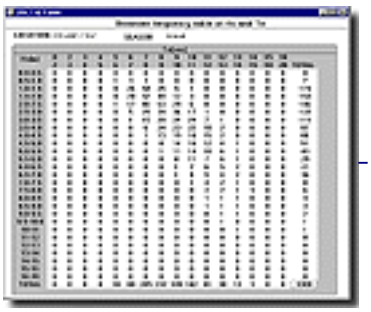


Click the red spots to see the next views of the demo.

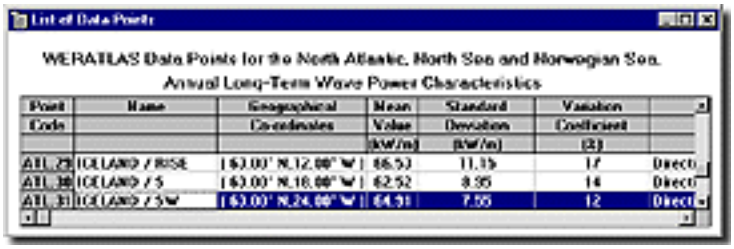


Click the red spots to see the next views of the demo.

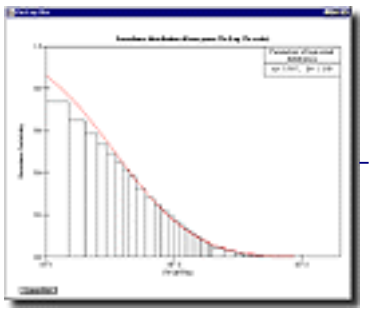
AVAILABLE SAMPLE



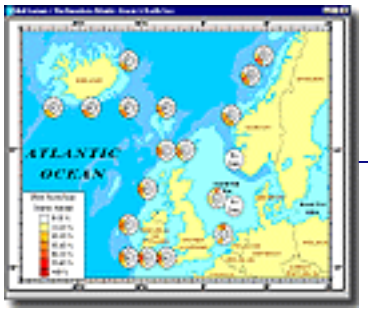
(H_s, T_e)Table



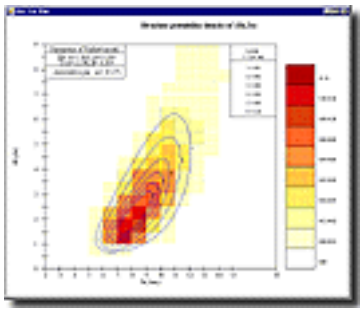
Wave Data and Basic Power Statistics



P_w log Plot



Map of Wave Power Roses



(H_s, T_e)Plot

(H_s, T_e) Table

TOP

(Hs,Te) Table

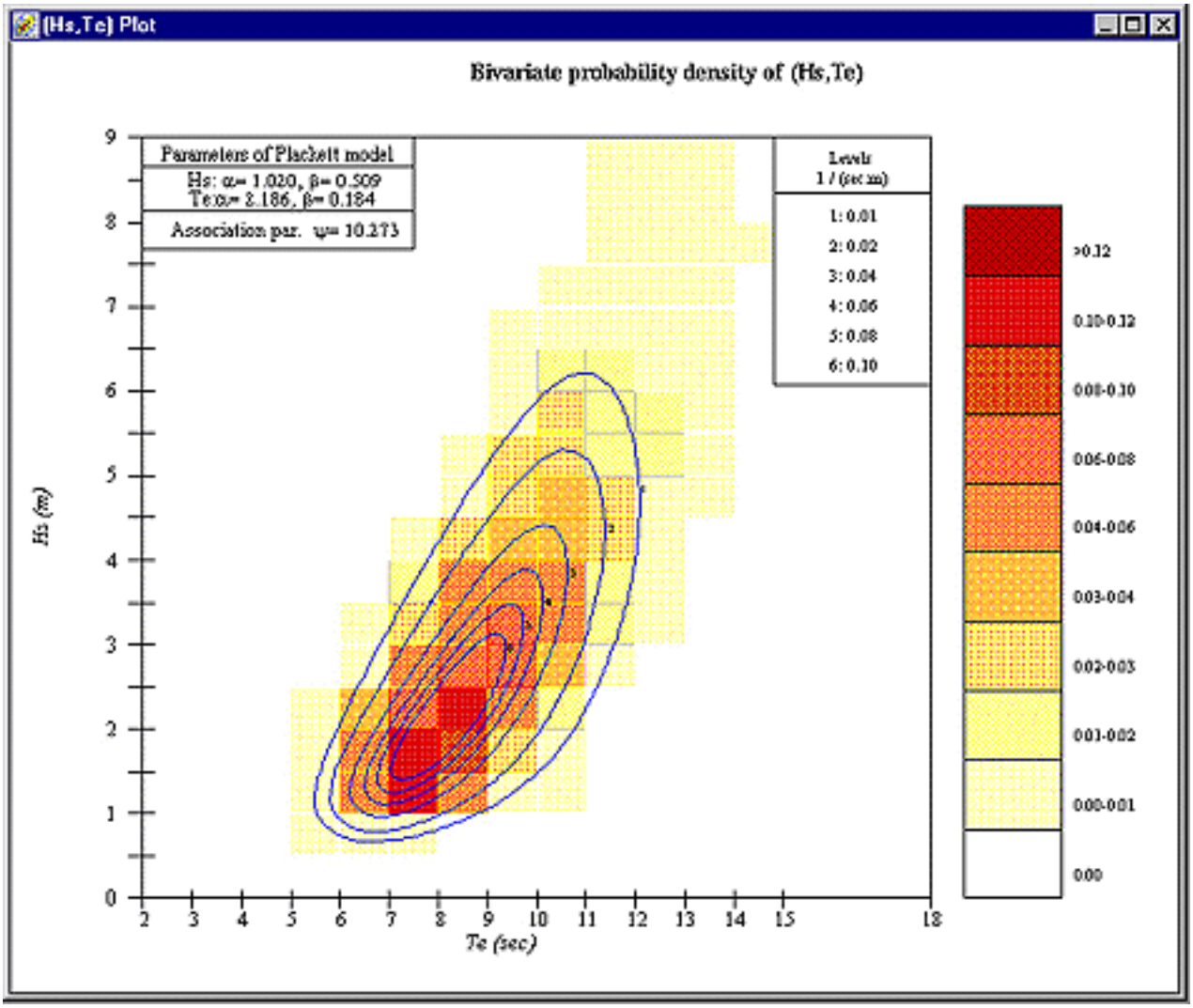
Bivariate frequency table of Hs and Te

LOCATION: ICELAND / SW SEASON: Annual

Hs(m)	Te(sec) 0-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-18	18-20	TOTAL
0.0-0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.5-1.0	0	0	0	0	1	3	3	0	0	0	0	0	0	0	0	0	7
1.0-1.5	0	0	0	0	4	26	54	25	5	1	0	0	0	0	0	0	115
1.5-2.0	0	0	0	0	4	28	57	49	12	3	0	0	0	0	0	0	153
2.0-2.5	0	0	0	0	1	17	40	53	29	6	0	0	0	0	0	0	146
2.5-3.0	0	0	0	0	0	5	29	34	36	17	1	0	0	0	0	0	122
3.0-3.5	0	0	0	0	0	1	15	29	34	24	7	1	0	0	0	0	111
3.5-4.0	0	0	0	0	0	0	6	24	23	22	10	2	0	0	0	0	87
4.0-4.5	0	0	0	0	0	0	1	13	19	16	15	2	0	0	0	0	66
4.5-5.0	0	0	0	0	0	0	0	4	14	16	12	4	1	0	0	0	51
5.0-5.5	0	0	0	0	0	0	0	1	11	14	10	6	1	0	0	0	43
5.5-6.0	0	0	0	0	0	0	0	0	4	11	7	6	1	0	0	0	29
6.0-6.5	0	0	0	0	0	0	0	0	1	7	6	5	2	0	0	0	21
6.5-7.0	0	0	0	0	0	0	0	0	1	4	5	4	2	0	0	0	16
7.0-7.5	0	0	0	0	0	0	0	0	0	1	4	2	1	0	0	0	8
7.5-8.0	0	0	0	0	0	0	0	0	0	0	2	2	1	1	0	0	6
8.0-8.5	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	3
8.5-9.0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	3
9.0-9.5	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2
9.5-10.0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
10-11	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
11-12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12-13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13-14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16-20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	10	80	205	232	189	142	81	38	13	1	0	0	1000

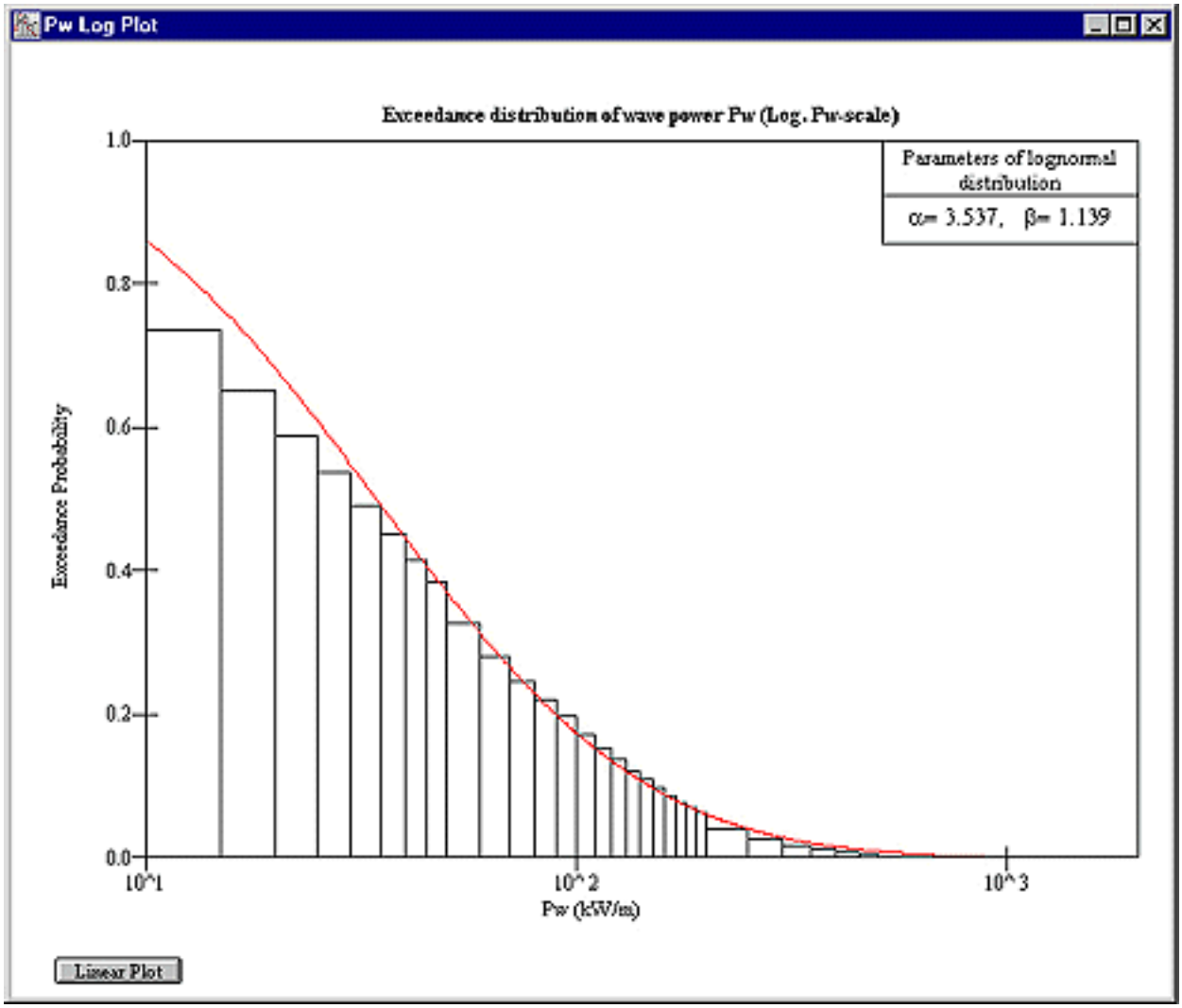
(H_s, T_e) Plot

TOP



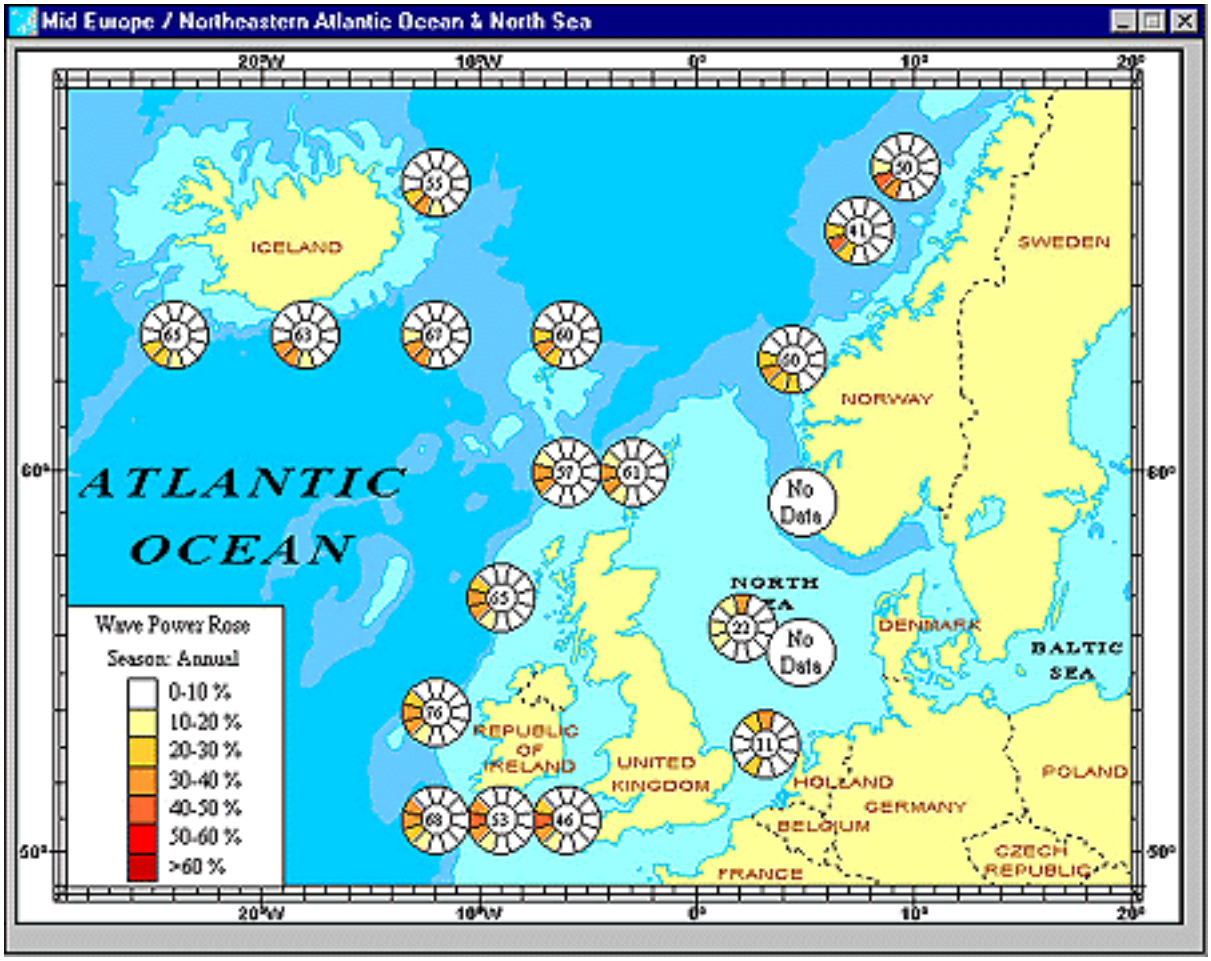
P_w log Plot

TOP



Map of Wave Power Roses

TOP



Wave Data and Basic Power Statistics

TOP

List of Data Points

WERATLAS Data Points for the North Atlantic, North Sea and Norwegian Sea.
Annual Long-Term Wave Power Characteristics

Point Code	Name	Geographical Co-ordinates	Mean Value (kW/m)	Standard Deviation (kW/m)	Variation Coefficient (%)	
ATL.29	ICELAND / RISE	(63.00° N,12.00° W)	66.53	11.15	17	Directi
ATL.30	ICELAND / S	(63.00° N,18.00° W)	62.52	8.95	14	Directi
ATL.31	ICELAND / SW	(63.00° N,24.00° W)	64.91	7.55	12	Directi

The WERATLAS Group

INETI

Instituto Nacional de Engenharia e Tecnologia Industrial, I.P.
Dept. Renewable Energies
Lisbon - PORTUGAL

Dr. M. Teresa Pontes (co-ordinator)
(teresa.pontes@ineti.pt)

NTUA

National Technical University of Athens;
Dept. Naval Architecture and Marine Engineering
Athens - GREECE

Dr. Gerassimos A. Athanassoulis
(mathan@naval.ntua.gr)

ISMAR

Istituto di Scienze Marine
Venice - ITALY

Dr. Luigi Cavaleri *(luigi.cavaleri@ismar.cnr.it)*

HWU

Heriot-Watt University
Dept. Actuarial Mathematics & Statistics
Edinburgh - U.K.

Prof. Denis Mollison *(denis@ma.hw.ac.uk)*

OCEANOR

Oceanographic Company of Norway, S.A.
Trondheim - NORWAY

Dr. Stephen Barstow *(stephen.barstow@oceanor.no)*

UCC

University College Cork Hydraulics and Maritime Research Centre
Cork - IRELAND

Drs. Brian Holmes & Anthony Lewis

IM

Instituto de Meteorologia
Lisbon - PORTUGAL

Dr. Henrique Oliveira-Pires *(oliveira.pires@meteo.pt)*

WERATLAS

Home
Products
Sample
Links
Purchase

Purchase

Purchase Information

To order the WERATLAS Software & User's Guide, the Technical Report, or both, please send an e-mail to

teresa.pontes@ineti.pt
or
sec.der@ineti.pt

Price (VAT Not Included):

Weratlas & User's Guide..... 200 €

Technical Report..... 50 €