

MARINE STRUCTURES DESIGN 2019-2020 Spring semester

Content and schedule of the **Marine Structure Design** course, and some design parameters are given below. The students are intended to follow the rules and complete the given tasks.

Course Coordinator: Prof. Dr. Yalçın Yüksel

I- ASSIGNMENT CONTENT

MARINE STRUCTURES DESIGN

FOREWORD;

The objective and content of the project, work to be done, source of the data should be explained briefly, and the results should be mentioned.

TABLE OF CONTENTS

LIST OF SYMBOLS

LIST OF FIGURES

ABSTRACT

CHAPTER 1 DESIGN OF BERTHING STRUCTURES

- 1.1 Introduction of the project, objective
- 1.2 Determination of soil type and soil profile
- 1.3 Determination of design vessel dimensions
- 1.4 Preparation of harbor plan (Long term wave statistics, shoaling and diffraction calculations, turning circle and navigation channel calculations, schematic layout plan)
- 1.5 Calculation of mooring and berthing loads of design vessel
- 1.6 Design of the berthing structure and suggestions
- 1.7 Calculation of the bearing capacity and settlement of foundation
- 1.8 Discussion and design structure type
- 1.9 Selected structural materials and protection methods

BÖLÜM 2 RUBBLE MOUND BREAKWATER DESIGN

- 2.1 Irregular wave shoaling
- 2.2 Breakwater design
- 2.3 Calculation of the bearing capacity and settlement of foundation

BÖLÜM 3 ENVIRONMENTAL ASSESSMENT OF THE STUDY SITE

REFERENCES

APPENDIX

Important Notes

- 1- All the sources used in preparation of the report should be cited, and they should be listed in references. **ETHICAL** rules should be followed in the work done.
- 2- Quoting directly from other sources and project reports (especially from the other project teams' work or the project assignments completed in previous years) will be considered as an ETHICAL rule violation, your work will be evaluated as unsatisfactory in this case, and this situation will be reported to the Department.
- 3- Presentations should be prepared in PowerPoint including the following headlines, not exceeding 10 slides;
Title, Objective, Project Site, Method, Elements of Project and Conclusion.
- 4- Project reports must meet the Civil Engineering Department Graduation Thesis format requirements. The page next to the cover page of the report should include the text below, and this page should be signed by all the students in the project team.

We declare that this project report has been completely prepared and submitted, meeting the rules announced before by the coordinator of the course and ethical requirements; considering the engineering standards and realistic conditions/ constraints (economical environmental problems, sustainability, producibility, health, security, ethical, social and political problems). It is our shared responsibility if the project is rejected due to not following the rules, having missing parts and not meeting the submission deadline.

<i>Student ID</i>	<i>Name- Last name</i>	<i>Signature</i>
042xxxxx	AAAAAA BBBB	CCCCC (<i>handwritten blue ink signature at the time of submission</i>)

II- ASSIGNMENT PARAMETERS

2019-2020 Spring Semester MARİNE STRUCTURES DESIGN DATA SHEET

Group	Student ID	Name, Last name	Coordinates	Vessel Type	Current velocity (m/s)	Vessel cruising speed (knot)	Max. Tidal range (cm)	Number of Berthing structures	Drilling Locations	Density of seawater ρ (kg/m ³)	Advisor
G1	15049901	Eneshan SANCAK	36.00N 34.00E	Konteyner 80,000DWT	0.10	6	*	2	*	*	Assist. Prof. Dr.Cihan Şahin
	15049016	Ahmet DURAN									
	16049003	Burak BİLGİN									
	15049019	Ertuğul YILMAZ									
	16049046	Sedat KARA									
	16049905	Ragım HAMEDOV									
	16049034	Nazife AYDIN									
	14049014	Ramazan ÇELEBİ									
G2	15049006	Mehmet Vefa İLGÜN	41.50N 40.70E	Bulk Carrier 100,000DWT	0.30	3	*	2	*	*	Assoc.Prof. Dr. Mehmet Öztürk
	15049009	Bumin Kaan BAYSAN									
	15042614	Fatih M. KARAKAVAK									
	15049020	Halit KANDEMİR									
	16049045	Burak ASLAN									
	15049024	Mehmet Ali KÖSEN									
	15049029	Cihat DEMİR									
	13042907	Musab TELLİ									

*** To be determined by the students.**

III- DESIGN STEPS TO BE FOLLOWED

- 1) Selection of design vessel dimensions
- 2) Determination of soil profile
- 3) Preparation of harbor plan (Long term wave statistics, Shoaling and diffraction calculations, Turning circle)
- 4) Environmental impact assessment of the project area and ethical decisions. Environmental system of the coastal zone and urban planning
- 5) Determination of environmental loads
- 6) Calculation of mooring and berthing loads of design vessel
- 7) Design calculations of gravity quaywalls
- 8) Discussion on different berthing structure types
- 9) Rubble mound breakwater design calculations
- 10) Placement of the designed marine structure on soil profile and determination of soil parameters
- 11) Calculation of the bearing of foundation
- 12) Calculation of the settlement of foundation
- 13) Stability calculations
- 14) Physical model of a Caisson type berthing structure

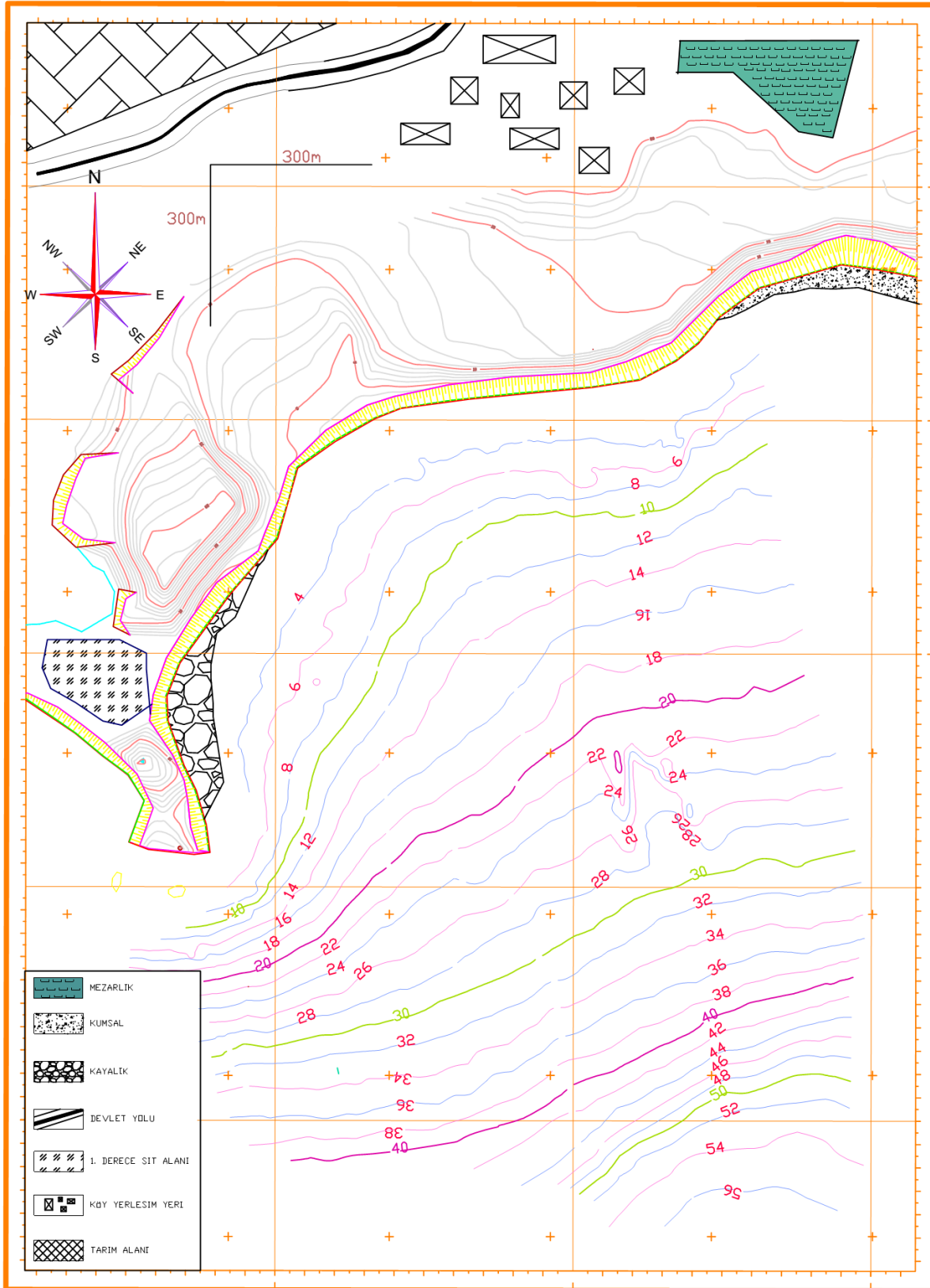
Goal; Ability of experimental design, the execution of the experiment, data collection, analysis and interpretation of the results in order to investigate complex engineering problems and disciplinary subjects. Model experiments will be performed for floating and immersion phases of the designed caisson. For this purpose, the steps below will be followed; Model dimensions will be determined.

- Experimental method and experiment design
- Performing experiments and data collection
- Interpretation of the data and conclusion
- Preparing the report and presentation

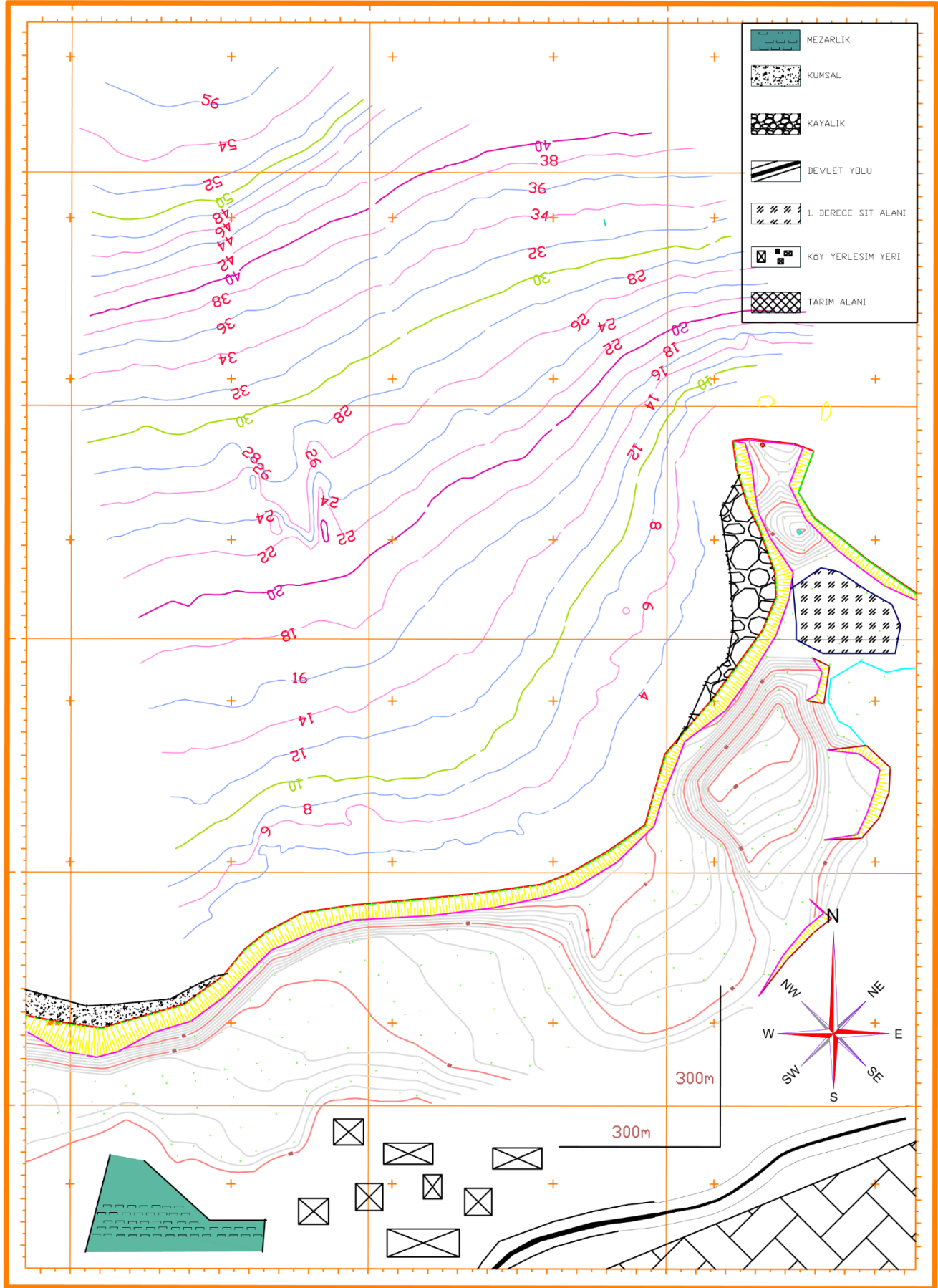
IV- SUGGESTED REFERENCES

- Liman Mühendisliği (2. Basım), Prof. Dr. Yalçın Yüksel ve Prof. Dr. Esin Çevik, Beta Yayınevi (2010)
- Deniz Tabanı Hidrodinamiği ve Kıyı Morfolojisi (2. Baskı), Prof. Dr. Yalçın Yüksel, BETA yayınevi (2011)
- Kıyı Mühendisliği (2. Baskı), Prof. Dr. Yalçın Yüksel ve Prof. Dr. Esin Çevik, Beta Yayınevi (2016)
- Kıyı Yapıları - Planlama ve Tasarım Teknik Esasları, T.C. Ulaştırma, Haberleşme ve Denizcilik Bakanlığı Altyapı Yatırımları Genel Müdürlüğü (AYGM), (2016)
- Kıyı ve Liman Yapıları, Demiryolları, Havameydanları İnşaatları Deprem Teknik Yönetmeliği, T.C. Ulaştırma, Haberleşme ve Denizcilik Bakanlığı Altyapı Yatırımları Genel Müdürlüğü (AYGM), (2008), İMO İstanbul Şubesi (2009)
- Dalgakıran Tasarımı, Prof. Dr. Yalçın Yüksel, BETA yayınevi (2011)
- Yuksel et al., “Seismic Response of Coastal and Port Structures”, Chapter 15, World Scientific, 2017.
- Coastal Engineering Manual (2003)
- CERC (Shore Protection Manual) (1984)
- OCDI (2009)
- British Standards, BS
- PIANC
- CIRIA, Rock Manual (2012)

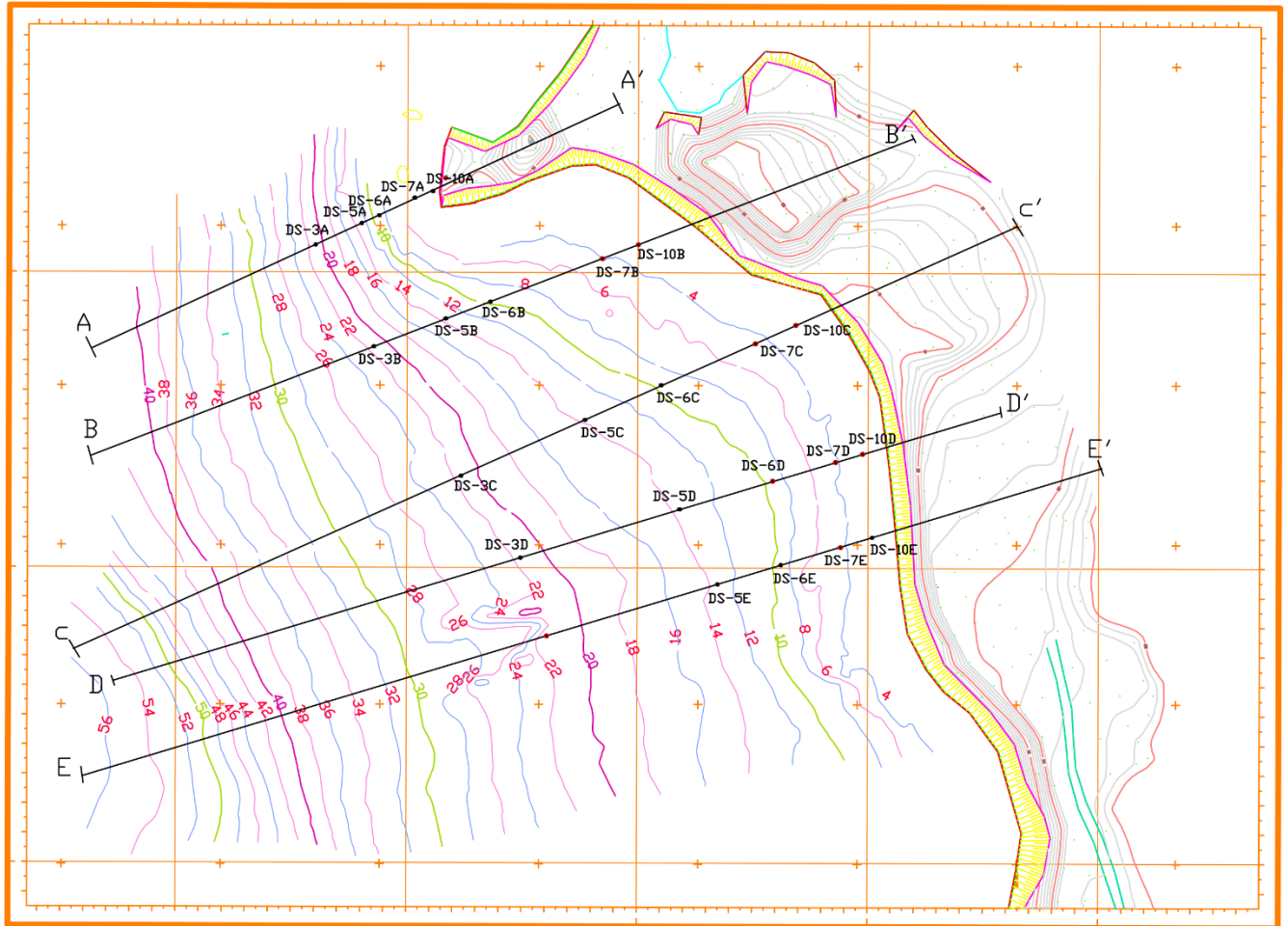
GROUP 1



GROUP 2



DRILL MAP



DRILL LOGS

DS3

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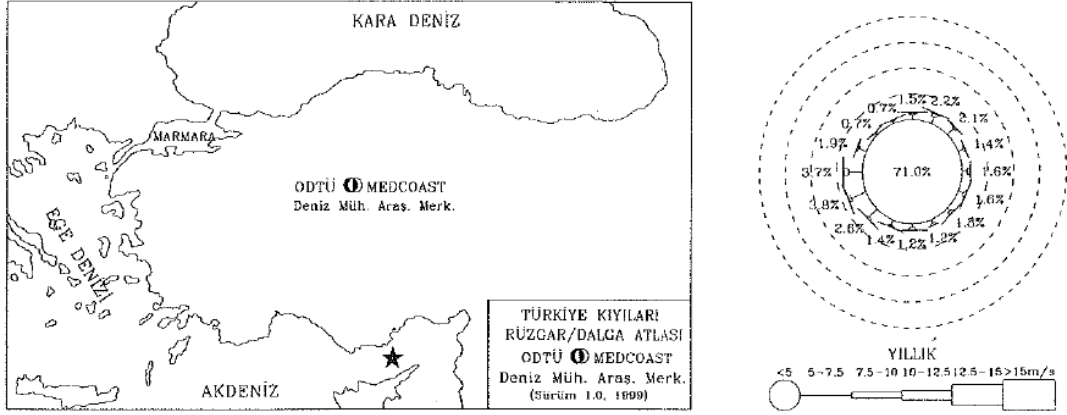
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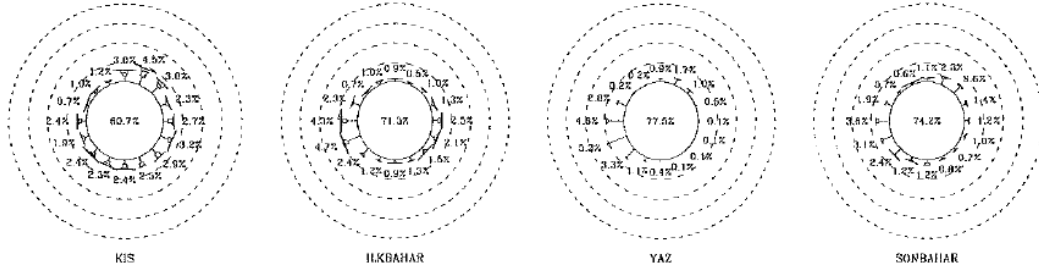
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WIND AND WAVE CLIMATE

Rüzgar İklimi: 36.00° N, 34.00° E

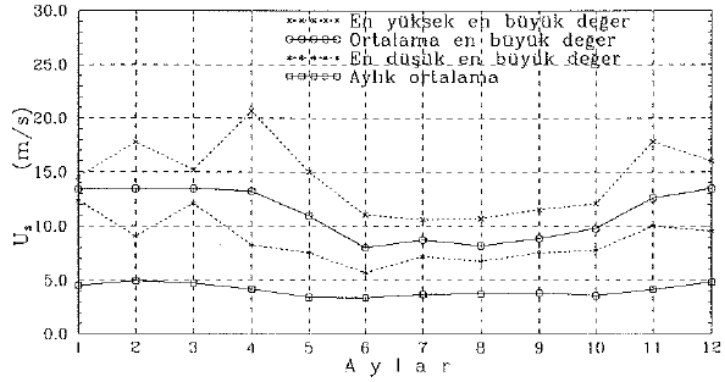


1. Yıllık rüzgar gülü



2. Mevsimsel rüzgar gülleri

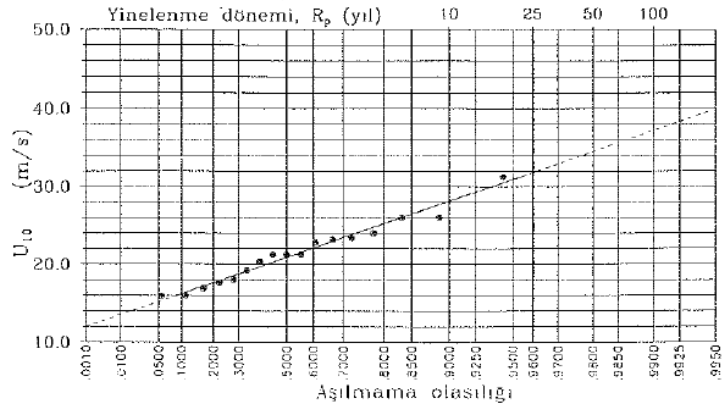
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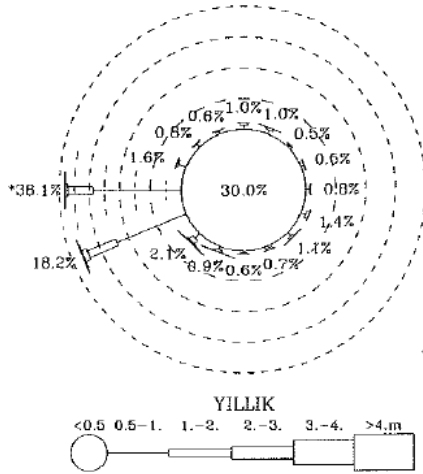
4. Yıllık en büyük rüzgar hızlarının en büyük değer istatistiği.

Etkin yön dilimi:
SW-WSW

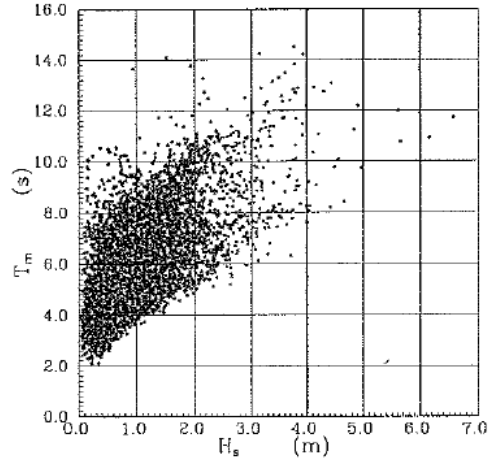
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ENE



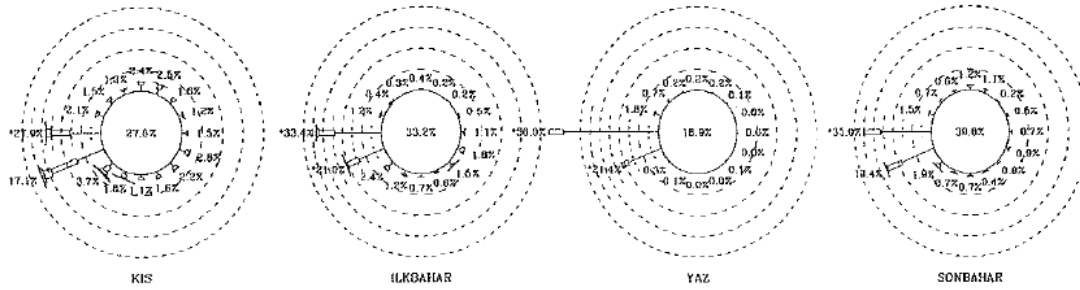
Dalga İklimi: 36.00° N, 34.00° E



5. Yıllık dalga gülü

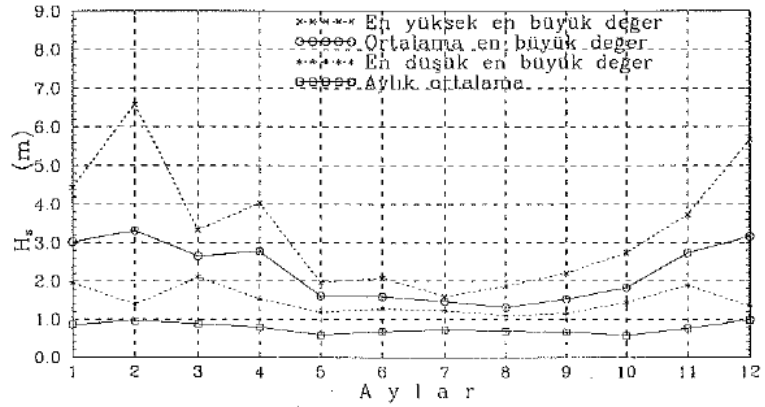


6. T_m ve H_s arasındaki bağıntı



7. Mevsimsel dalga gülleri

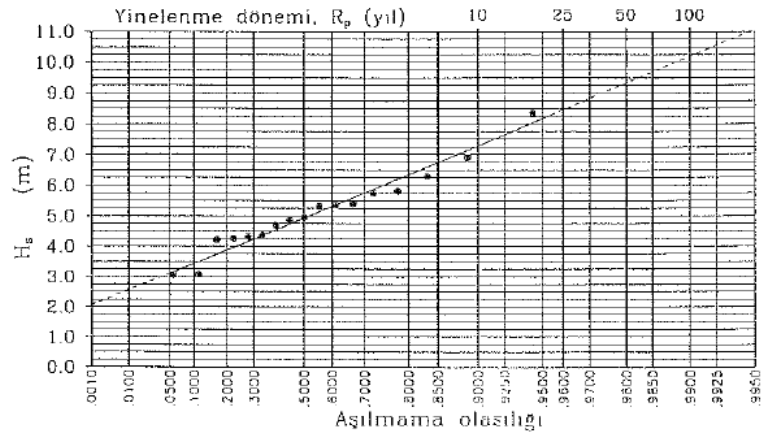
8. Aylık ortalama ve en yüksek (en yüksek, en küçük ve ortalama) belirgin dalga yüksekleri (H_s).



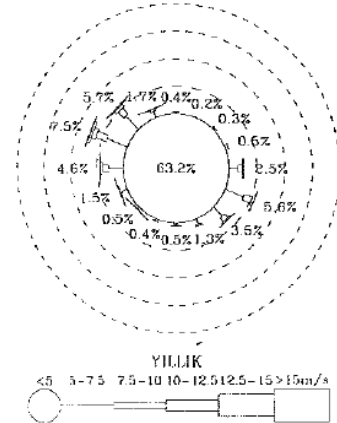
9. Yıllık en büyük belirgin dalga yükseklerinin en büyük değerler istatistiği.

Etkin yön dilimi:
WSW-W

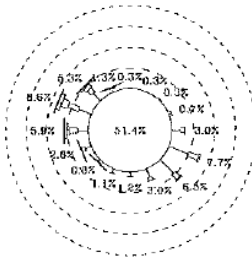
İkincil yön dilimi:
ENE



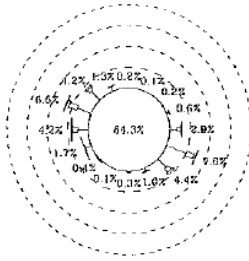
Rüzgar İklimi: 41.50° N, 40.70° E



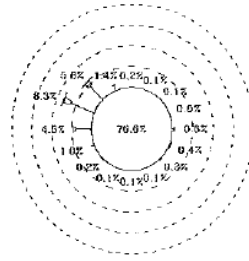
1. Yıllık rüzgar gülü



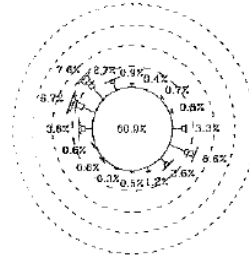
KIS



ILKBAHAR



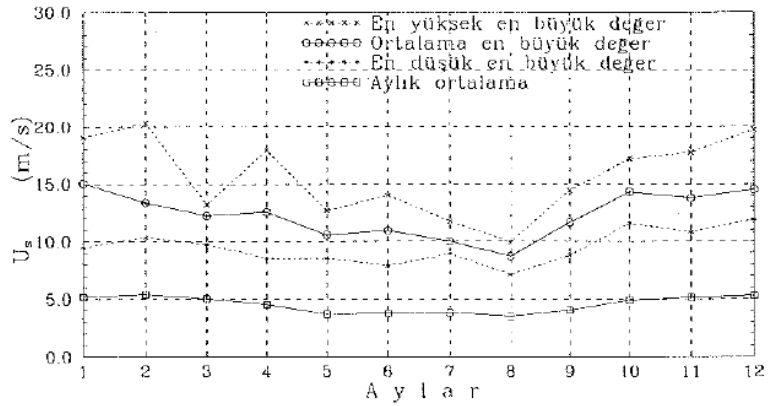
YAZ



SONBAHAR

2. Mevsimsel rüzgar gülleri

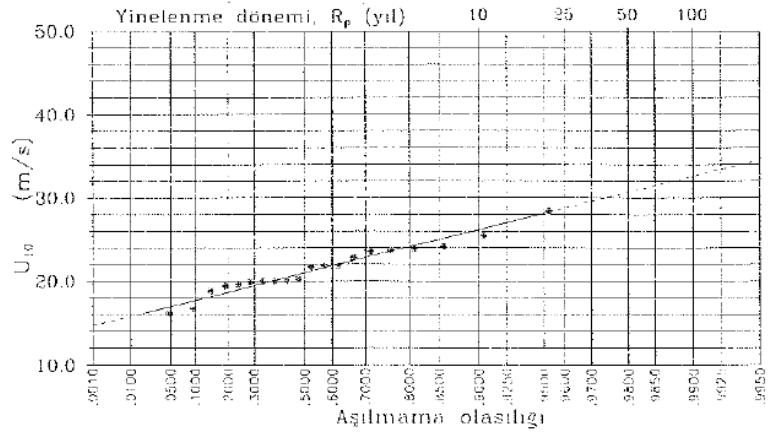
3. Aylık ortalama ve en yüksek rüzgar hızları (en büyük, en küçük ve ortalama değerleri).



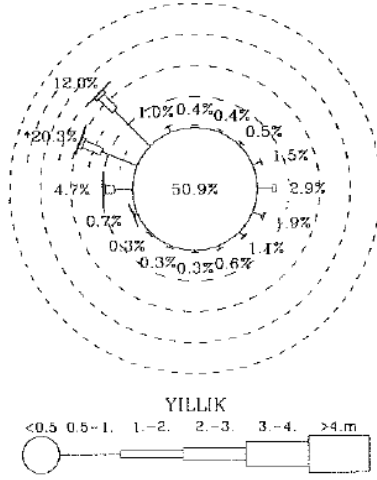
4. Yıllık en büyük rüzgar hızlarının en büyük değer istatistiği.

Etken yön dilimi:
SSW

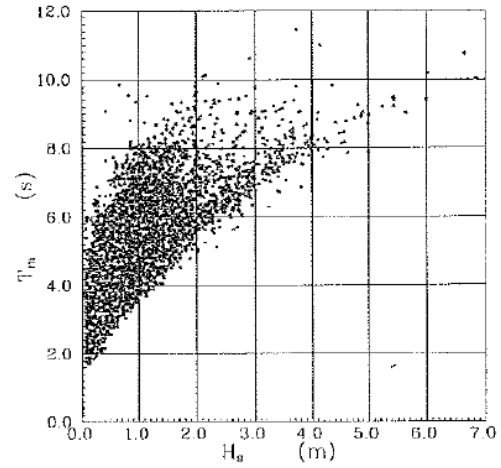
İkincil yön dilimi:
E



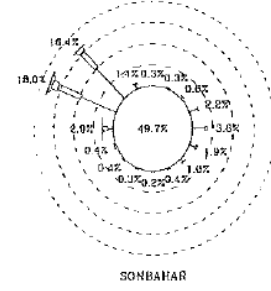
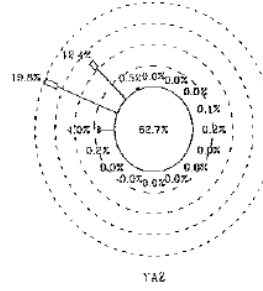
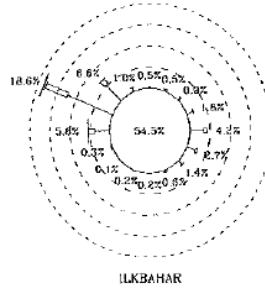
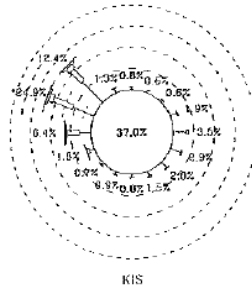
Dalga İklimi: 41.50° N, 40.70° E



5. Yıllık dalga gülü

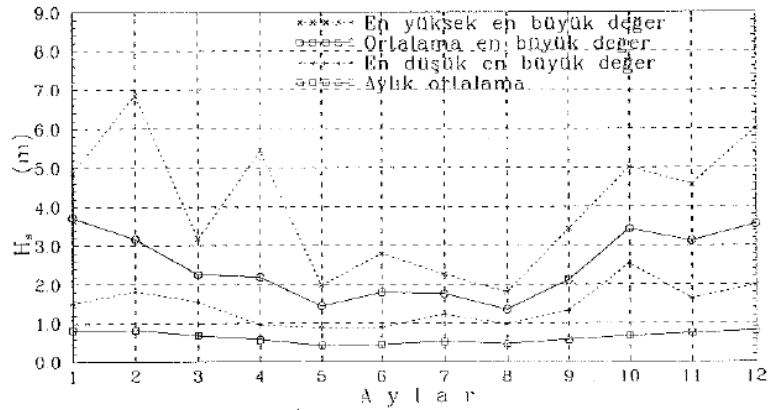


6. T_m ve H_s arasındaki bağıntı



7. Mevsimsel dalga gülleri

8. Aylık ortalama ve en yüksek (en yüksek, en küçük ve ortalama) belirgin dalga yüksek-leri (H_s).



9. Yıllık en büyük belirgin dalga yükseklerinin en büyük değerler istatis-tiği.

Etken yön dilimi:
WNW-N

İkincil yön dilimi:

