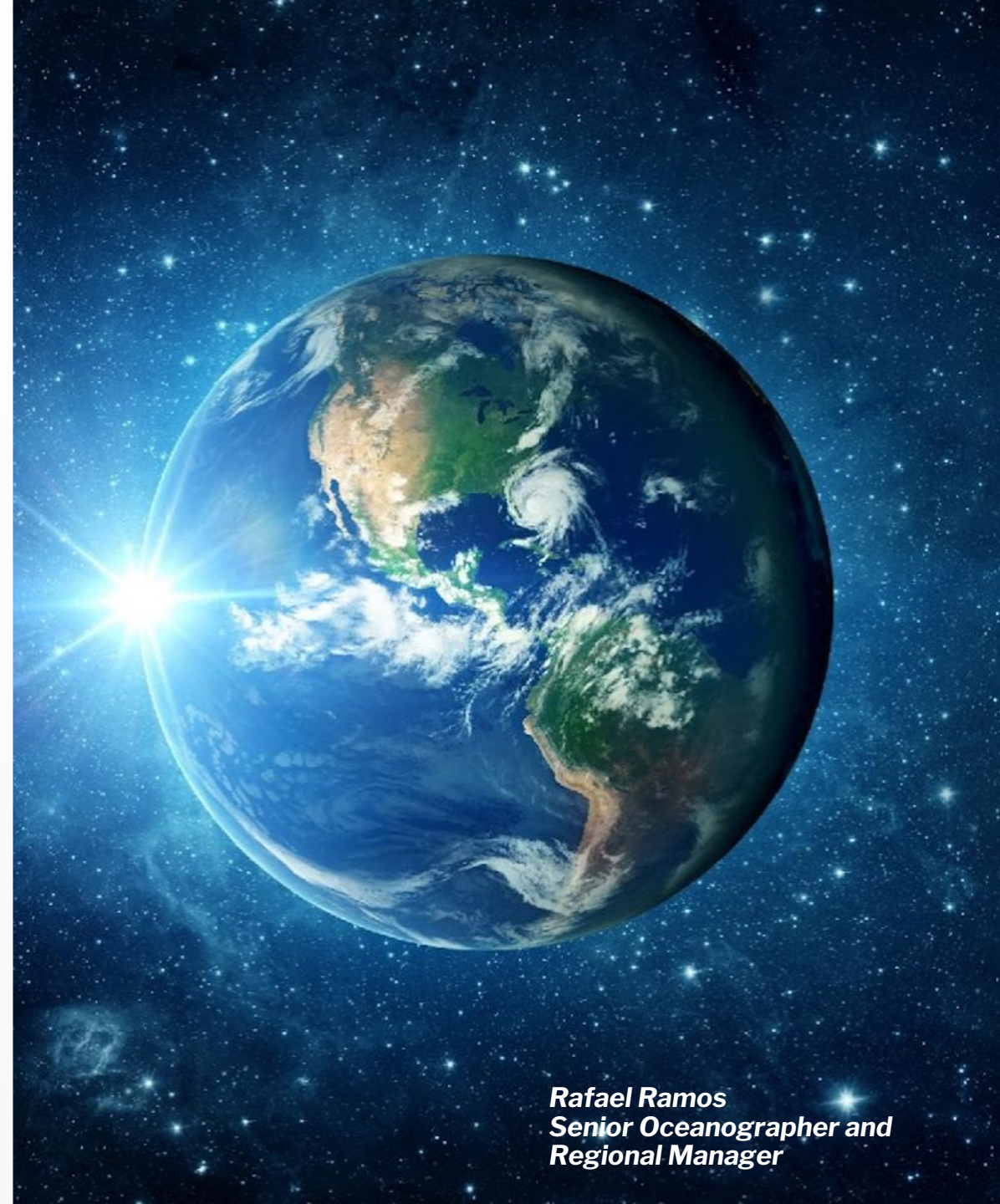


Offshore Wind Renewable Energy and Data in the Gulf of Mexico

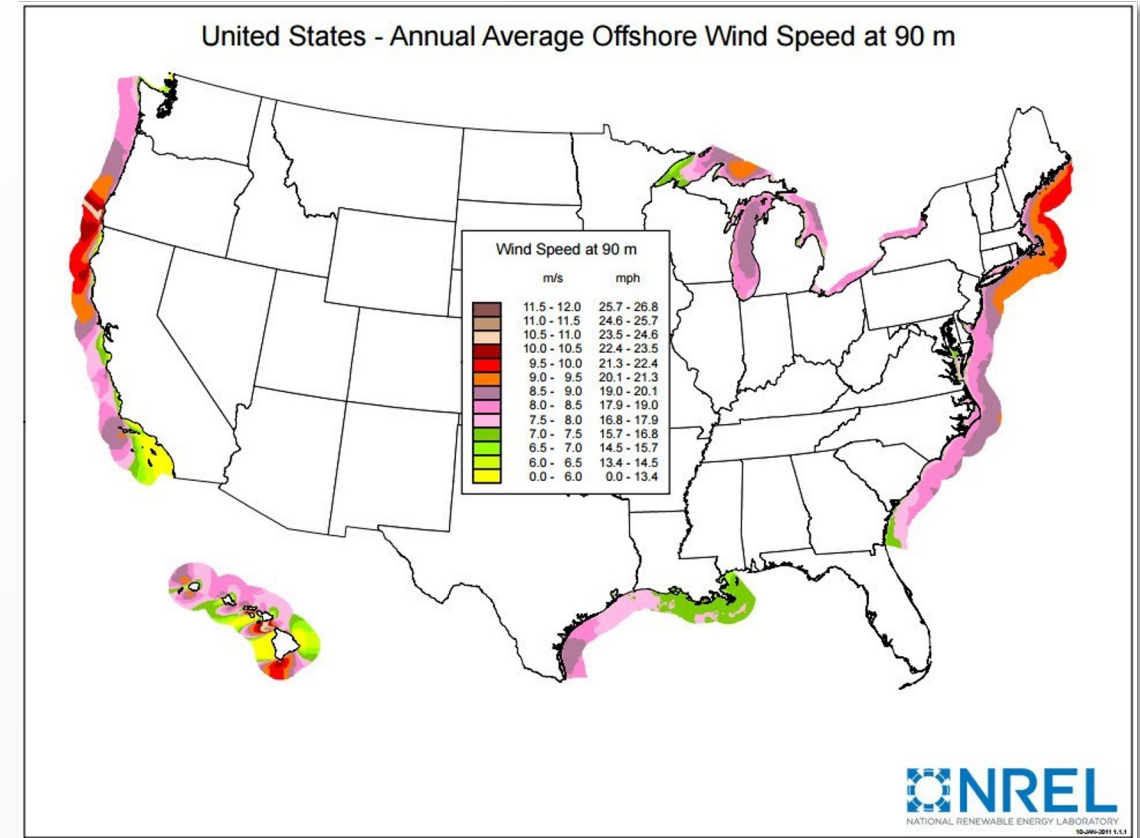
Overview of the Data Requirements



Rafael Ramos
Senior Oceanographer and
Regional Manager

OW Industry in the US

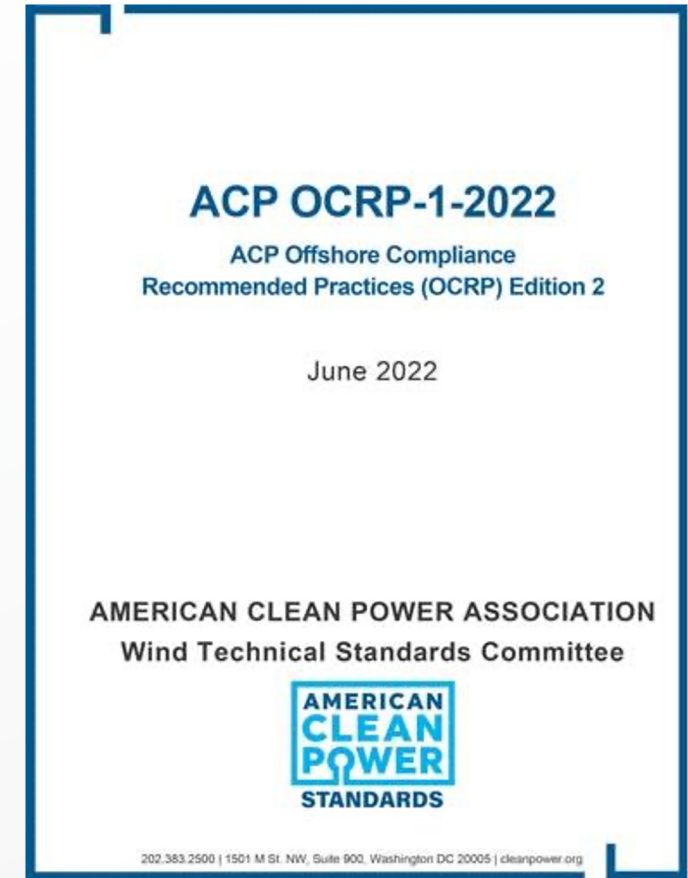
- New industry (when compared to Fisheries, Shipping, O&G)
- Growth accelerated by geopolitical events (monetary policy, COVID, Ukraine, 30GW by 2030)
- 40MW under development¹
 - 2 projects in operation
 - 2 projects under construction
 - 18 projects in permitting
- Significant country-wide potential
 - North Atlantic (New York, New Jersey, Connecticut, Rhode Island, Massachusetts)
 - South Atlantic (Maryland, Virginia, North Carolina, South Carolina)
 - Pacific (California, Oregon, Hawaii)
 - Gulf of Maine
 - Lake Erie
 - Gulf of Mexico
- Highly scrutinized (high public awareness and high sensitivity to environmental impacts)



¹ Data from Offshore Wind Market Report: 2022 Edition, US DOE

Metocean Requirements for OW Infrastructure Development in the US

- General Requirements
 - BOEM/BSEE Permitting Requirements (EIAs, SAP, COP, FDR, etc.)
 - State Waters Permitting Requirements
 - Stakeholder Requirements
 - Operator Requirements
 - Certifying Authority Requirements
- Applicable ANSI/ACP Standards 2022 Edition
 - Offshore Compliance Recommended Practices (OCRP-1-2022)
 - US Floating Wind Systems Recommended Practices (OCRP-2-202#)
 - US Offshore Wind Metocean Conditions Characterization (OCRP-3-202#)
 - US Recommended Practices for Geotechnical and Geophysical Investigations and Design (OCRP-4-202#)
 - Recommended Practices for Submarine Cables (OCRP-5-202#)



Offshore Wind Metocean Conditions Characterization (OCR-3-202#)

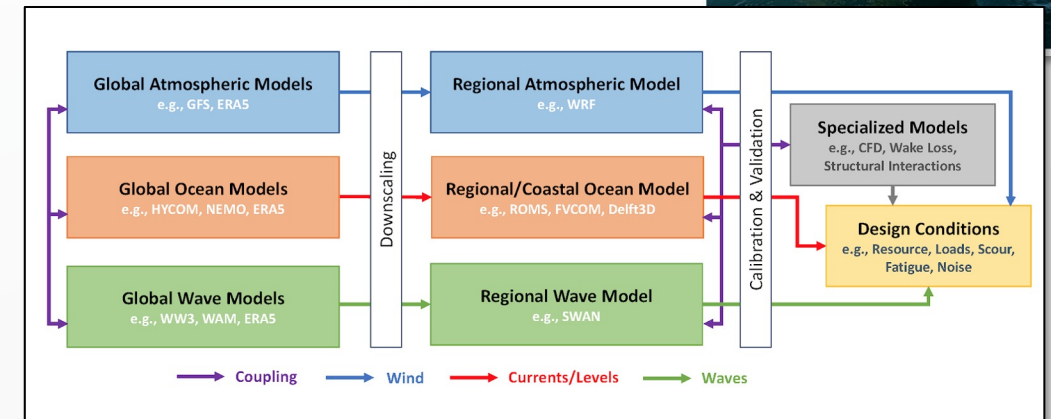
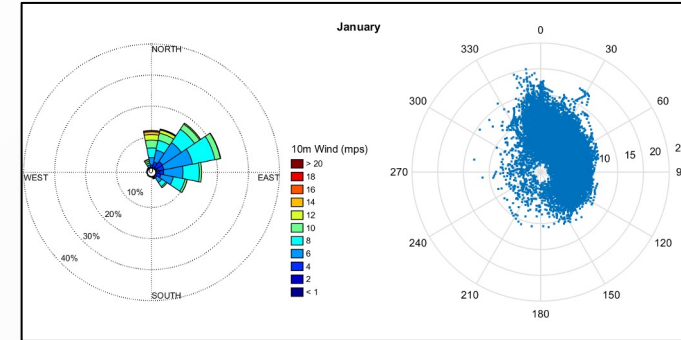
- Metocean Strategy
 - Data requirements through service life
 - Planning data generation and acquisition
- Observational Metocean Data Needs
 - Wind field properties including profiles of speed and turbulence intensity
 - Wave field properties
 - Current field properties
 - Storm surge
 - Tide elevation and tidal currents
 - Water properties (density, temperature, pH, turbidity)
 - Marine growth
 - Sediment transport
 - Sea level change
 - Air properties (density, temperature)
 - Lightning

Data Type	Phase				
	Planning, Site Assessment & Permitting	Design	Transport & Installation	Operation & Maintenance	Life Extension, Repowering & Decommissioning
Regional modelled data					
Regional measured data					
Site specific modelled data					
Site specific measured data					
Forecast data					
Real time data					

Source: Offshore Wind Metocean Conditions Characterization (OCR-3-202#)

Offshore Wind Metocean Conditions Characterization (OCR-3-202#)

- Numerical Modelling Data Needs
 - Different types of models
 - Length of simulations (decades to months)
 - Deterministic and probabilistic
 - High-resolution and nesting
 - Validation and data assimilation
- Data Collection and Management Needs
 - Different measuring platforms, instruments, and technologies
 - Storage and housekeeping (metadata)
 - Archiving in existing repositories (NCEI, NDBC, Space-Borne Facilities, IOOS, Research Centers, Universities, local government databases)
- Data Analysis and Interpretation
 - Wind resource assessment
 - Develop design and operating criteria
 - Normal and extreme conditions for turbine design



Source: Offshore Wind Metocean Conditions Characterization (OCR-3-202#)

GCOOS Support for OW Development in the GOM

- Serve as local public data repository (model and observational) and specialty studies (past and present)
- Host operational models
- Collaborate with operators to host & display non-confidential observational data from measuring programs
- Provide visualization platform for various data types including tracking of marine life (e.g., NERACOOS Mariners Dashboard)
- Support/aid offshore measurement efforts (wind, wave, current, water quality, atmospheric variables, etc.)
- Provide/serve real-time observational data for improvement of forecast models
- Liaise between OW operators and other industry stakeholders in the GOM (fisheries, O&G, shipping, research centers, etc.)
- Provide measurements for accurate assessment of wind resource (e.g., PNNL Flidar Buoy)
- Engage with OW operators to learn specific needs for the area

