

Clíma Costero de Puerto Rico: Guía para Nautas



Sistema Caribeño de Observación Costera Oceánica





Sistema Integrado de Observación del Océano (IOOS)

IOOS provee información sobre nuestras áreas costeras en apoyo a :

Seguridad en las operaciones marinas



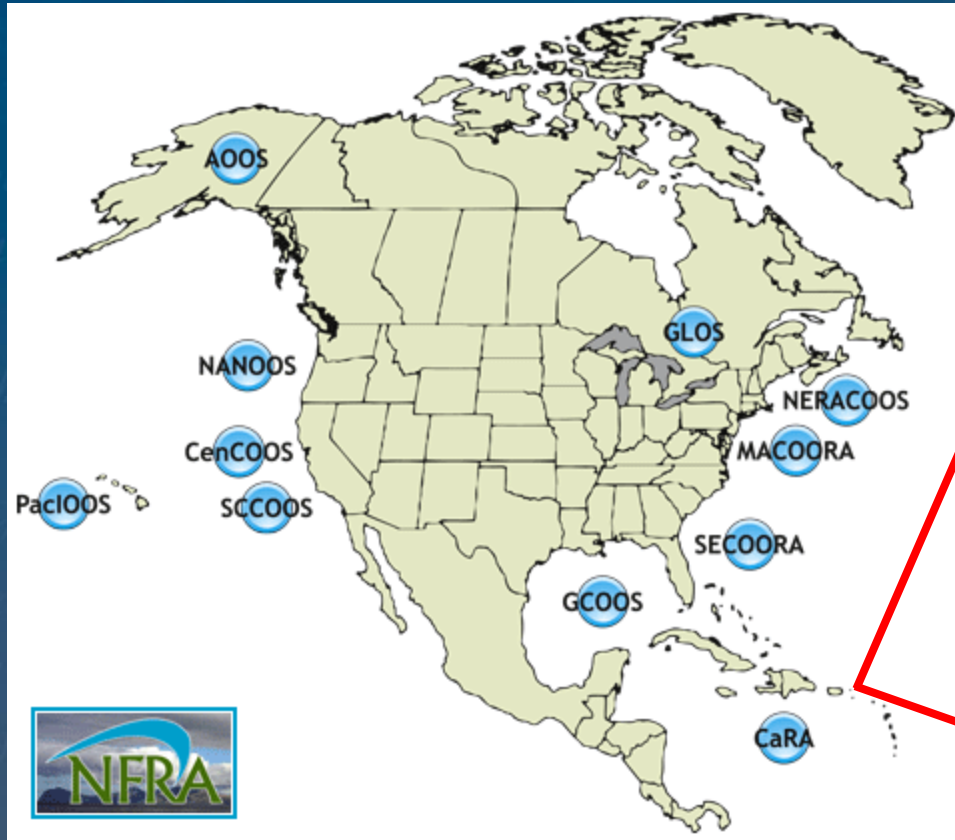
Desarrollo económico



Conservación de los recursos marinos



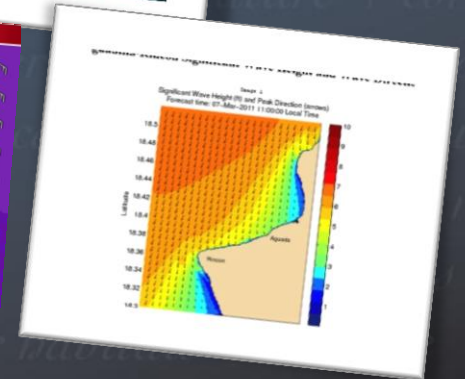
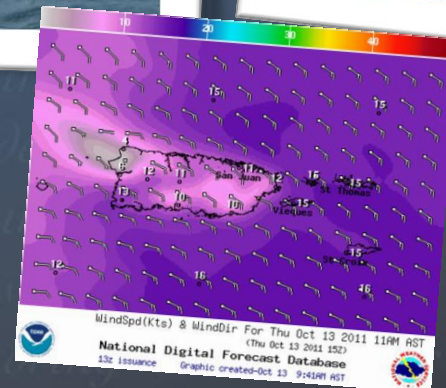
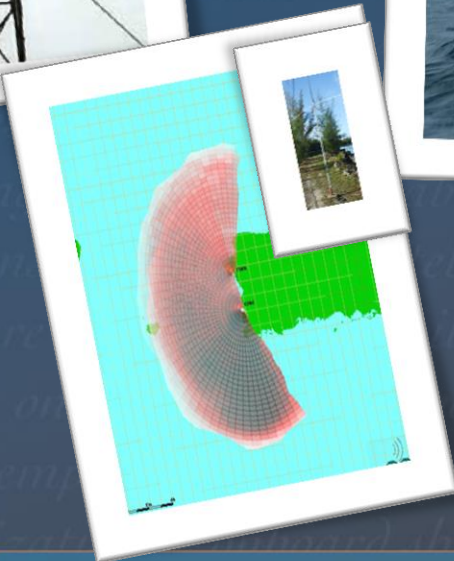
Sistemas de Observación Costeros



Red de 11 sistemas para satisfacer las necesidades regionales de información costera

Qué es CariCOOS?

Red de científicos, instrumentos (boyas, estaciones meteorológicas, radares, satélites) e infraestructura de comunicación para hacer observaciones y apoyar pronósticos de las condiciones costeras en Puerto Rico e Islas Vírgenes estadounidenses (St. Thomas, St. Croix, St. John).



Boyas “CariCOOS”

San Juan



Rincón

USVI

Ponce

Boya “Waverider”

- Altura de ola
- Dirección de ola
- Periodo de ola

- Altura y dirección de olas
- Velocidad de corrientes
- Velocidad y dirección de viento
- Salinidad
- Temperatura del agua
- Datos meteorológicos

https://twitter.com/caricoos

CarICOOS (caricoos) on Twitter - Mozilla Firefox

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(1614 unread) - ydetres - Yahoo! Mail Plume Detection Toolbox Premian su excelencia tecnológica CarICOOS (caricoos) on Twitter

Twitter, Inc. (US) https://twitter.com/caricoos kelvin to centigrades

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Puerto Rico - <http://www.caricoos.org>

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Tweets

CarICOOS @caricoos 10m
Conditions @ St John 4 PM: Wave height 2.9 ft from ESE(92 deg) @ 5.1 sec. Wind 12 kts from ENE. Surface current 0.24 kts towards WSW
Expand

CarICOOS @caricoos 15m
Conditions @ Ponce 4 PM: Wave height 3.8 ft from ESE(109 deg) @ 4.3 sec. Wind 19 kts from ESE. Surface current 0.21 kts towards WNW
Expand

CarICOOS @caricoos 20m
Conditions @ San Juan 4 PM: Wave height 3.3 ft from NE(62 deg) @ 5.9 sec. Wind 12 kts from ENE. Surface current 0.08 kts towards WSW
Expand

CarICOOS @caricoos 1h
Conditions @ St John 3 PM: Wave height 2.8 ft from ESE(94 deg) @ 5.4 sec. Wind 12 kts from ENE. Surface current 0.24 kts towards WSW
Expand

CarICOOS @caricoos 1h
Conditions @ Ponce 3 PM: Wave height 3.2 ft from ESE(112 deg) @ 6.5 sec. Wind 19 kts from ESE. Surface current 0.30 kts towards WNW
Expand

CarICOOS @caricoos 1h
Conditions @ San Juan 3 PM: Wave height 3.2 ft from NE(58 deg) @ 5.6 sec. Wind 12 kts from ENE. Surface current 0.08 kts towards

CariCOOS...

Apoyando la seguridad en la navegación



Sistema de Observación Oceánica Costera del Caribe
Caribbean Coastal Ocean Observing System

IOOS
INTEGRATED OCEAN OBSERVING SYSTEM

CariCOOS.org



vientos • olas • corrientes
mapas • datos • condiciones actuales
pronósticos y otros productos

www.caricoos.org

Capacitación de usuarios de la costa en la región de Puerto Rico e Islas Vírgenes para interpretar y utilizar la información de clima costero disponible de manera apropiada.

Usuarios de CariCOOS

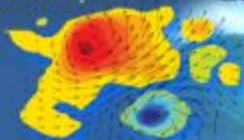


Que debo hacer antes de salir a navegar?

- Visitar la pagina de CariCOOS.org



- 1** Consultar el **pronóstico marítimo costero** del Servicio Nacional de Meteorología (información oficial) para la región de interés.
- 2** Utilizando el mapa de condiciones de vientos de CariCOOS, obtener la información actualizada de **velocidad y dirección de viento** a tiempo real así como pronósticos.
- 3** Utilizando el mapa de olas de CariCOOS, evaluar los datos de **tamaño y dirección de olas** a tiempo real así como pronósticos.



CariCOOS.org

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AND MORE...

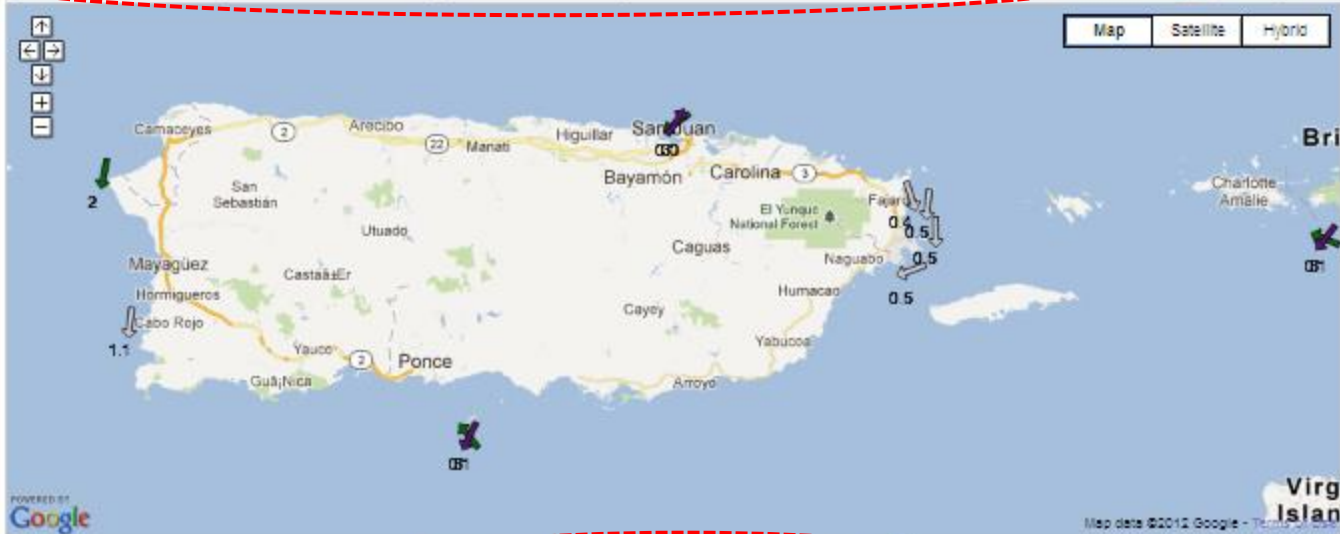
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- Hurricane Season
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- About

Latest Conditions and Forecast

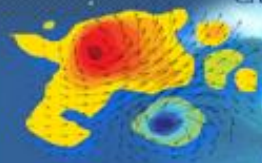
CariCOOS Buoys				Models			Marine Conditions		
San Juan	Ponce	Rincon	USVI	Wind Fros	SWAN	AMSEAS	Ocean Color	NWS - Frost	Hurricane Season

Click the arrows for data and graphs.

- Wind Observation
- Wave Observation
- Wave Forecast
- Surface Current Observation
- Tidal Current Forecast
- Missing Data



- Winds (Kts):
- Waves (ft):
- Currents:



CARIBBEAN COASTAL OCEAN OBSERVING SYSTEM

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Web Slice Gallery
<http://go.microsoft.com/fwlink/?LinkId=121315>

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Pronóstico Marítimo

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CariCOOS Buoys				Models			Marine Conditions		
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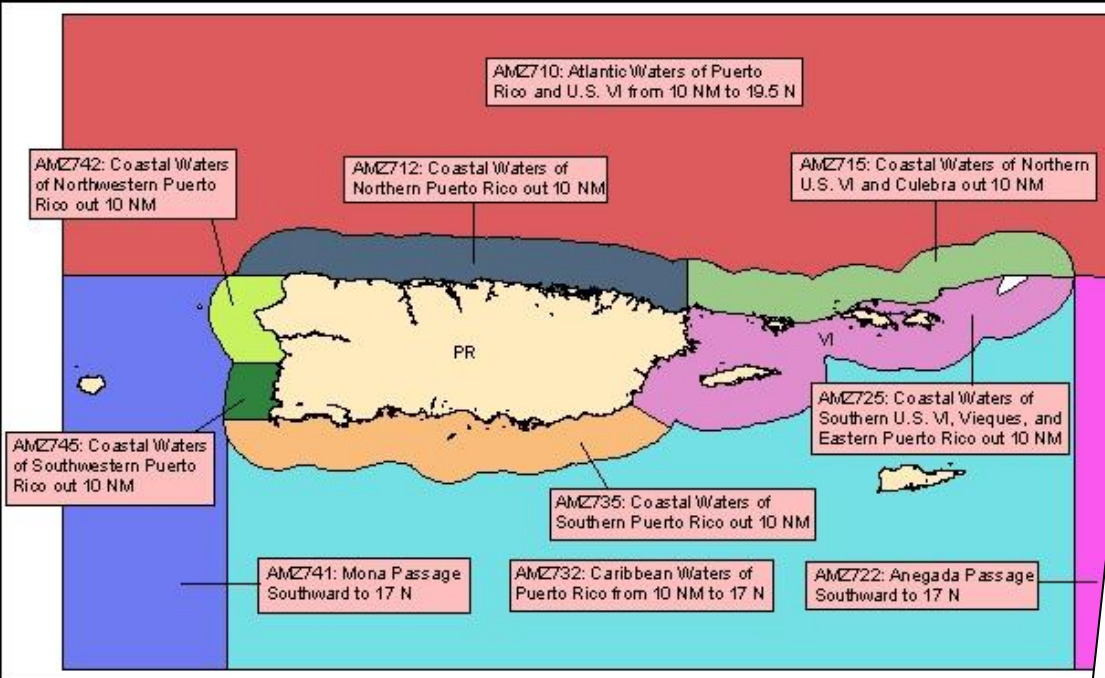
Click the arrows for data and graphs



Visitar la pagina CariCOOS.org para obtener la información necesaria para determinar las condiciones costeras en tu región de interés.

1

Pronóstico Marítimo (SNM-San Juan) Información Oficial



National Weather Service
NWS Marine Forecast

Local weather forecast by "City, St" or zip code City, St Go
 Cell Phone Weather/Marine Page (wap) URL: cell.weather.gov
 PDA Weather/Marine Page URL: mobile.weather.gov

AMZ700-240315-
1021 AM AST MON JUL 23 2012

.SYNOPSIS FOR PUERTO RICO AND THE U.S. VIRGIN ISLANDS WATERS...
 SURFACE HIGH PRESSURE NORTH OF THE AREA WILL CONTINUE TO PRODUCE
 FRESH TRADE WINDS THROUGH THURSDAY.

\$\$

AMZ735-240315-
COASTAL WATERS OF SOUTHERN PUERTO RICO OUT 10 NM-
1021 AM AST MON JUL 23 2012

SMALL CRAFT SHOULD EXERCISE CAUTION

REST OF TODAY
 EAST WINDS 14 TO 19 KNOTS. SEAS 4 TO 5 FEET.
 ISOLATED SHOWERS.

TONIGHT
 EAST NORTHEAST WINDS 15 TO 20 KNOTS. SEAS 4 TO 5 FEET.
 ISOLATED SHOWERS THROUGH THE NIGHT.

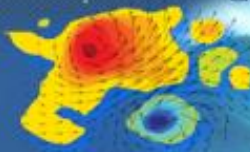
TUESDAY
 EAST WINDS 15 TO 20 KNOTS. SEAS 4 TO 5 FEET. ISOLATED
 SHOWERS IN THE MORNING...THEN ISOLATED THUNDERSTORMS IN THE
 AFTERNOON.

TUESDAY NIGHT
 EAST NORTHEAST WINDS 11 TO 16 KNOTS. SEAS 3 TO
 4 FEET. ISOLATED THUNDERSTORMS IN THE EVENING...THEN ISOLATED
 SHOWERS AFTER MIDNIGHT.

WEDNESDAY

Evaluar el pronóstico gráfico (Pronóstico Marítimo) del SNM (San Juan) para obtener la información oficial para tu región de interés. Pronóstico disponible para 10 regiones.





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Latest Conditions and Forecast

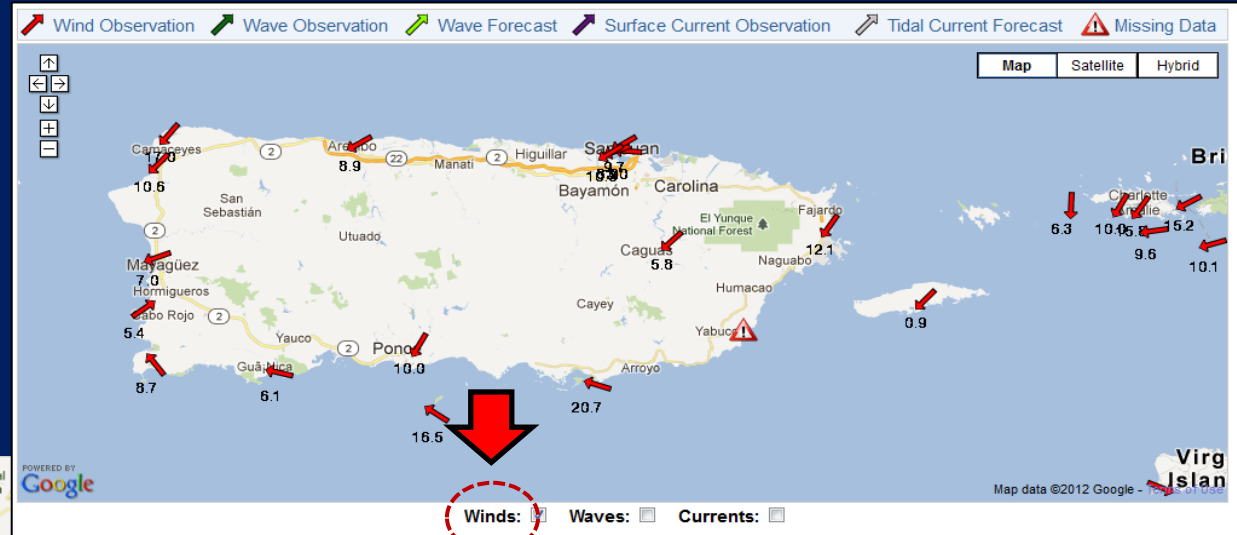
CariCOOS Buoys				Models			Marine Conditions		
San Juan	Ponce	Rincon	USVI	Wind Frcs	SWAN	AMSEAS	Ocean Color	NWS - Frost	Hurricane Season

Click the arrows for data and graphs



Obtener la información actualizada de velocidad y dirección de viento a tiempo real y pronósticos.

2 Mapa de VIENTO



Station: Club Deportivo del Oeste
 Latitude: 18.100016
 Longitude: -67.189253
 Date: Tue, 17 Jul 2012 18:20:00 GMT



Legend: Observation

Name: Club Deportivo del Oeste

Date: 2012-07-17

Time: (Local PR):	03	04	05	06	07	08	09	10	11	12	13	14
Wind Speed (kt):	3.6	3.2	3.6	3.9	1.8	1.7	3.8	3.0	3.3	7.0	5.2	6.5
Wind Direction (deg):	96	120	120	107	115	61	316	357	336	320	254	237
Wind Vector:												

Legend: Forecast

Name: Club Deportivo del Oeste

Date:	2012-07-17				2012-07-18								2012-07-19
Time: (Local PR):	17	20	23	02	05	08	11	14	17	20	23	02	
Wind Speed (kt):	4.1	6.0	8.9	6.0	6.0	9.9	4.1	8.9	6.0	7.0	5.1	2.9	
Wind Direction (deg):	290	20	60	80	60	60	110	40	50	50	60	90	
Wind Vector:													

Fecha →

Hora →

Velocidad →

Dirección →

Obtener datos de velocidad y dirección de viento para las estaciones de interés



Fuerza 0

Viento: < 1 nudo
Olas: 0 Ft.

Mar con apariencia de espejo



Fuerza 1 - Ventolina

Viento: 1 - 3 nudos
Olas: 0.5 Ft.

Mar comienza a risarse



Fuerza 2 - Suave

Viento: 4 - 6 nudos
Olas: 0.5 - 1 Ft.

Crestas de apariencia cristalina, pero no rompen.



Fuerza 3 - Leve

Viento: 7-10 nudos
Olas: 2 - 3 Ft.
Olas comienzan a romper.
Formación ocasional de copos de espuma.



Fuerza 4 - Moderado

Viento: 11-16 nudos
Olas: 3 - 4 Ft.

Olas la... cop...



Fuerza 5 - Regular



Fuerza 6 - Fuerte

...formarse olas... Espuma blanca cubre gran superficie. Al romper el mar produce fuerte ruido.



Fuerza 7 - Muy Fuerte

Viento: 28-33 nudos
Olas: 13 - 18 Ft.
Mar alborotado. Espuma blanca comienza a disponerse en bandas en dirección del viento.



Fuerza 8



Fuerza 9 - Temporal fuerte

Viento: 41 - 47 nudos
Olas: 25 - 33 Ft.

Olas altas de gran longitud; el mar comienza a "enrollarse". Bandas de espuma a lo largo de dirección de viento. Rociadas de agua pueden reducir visibilidad.



Fuerza 10- Temporal muy fuerte

Viento: 48 - 55 nudos
Olas: 30 - 40 Ft.

Olas altas de largas crestas volcándose como cascadas. El mar adquiere aspecto blancuzco. Visibilidad reducida.



Fuerza 11 - Tempestad

Viento: >55 nudos
Olas: 38 - 52 Ft.

Olas muy altas, mar cubierto de espuma blanca, ruido fuerte y ensordecedor. Visibilidad de objetos lejanos es imposible.

Escala Beaufort



Pronóstico de Vientos – SNM Puerto Rico e Islas Vírgenes

→
Velocidad del viento

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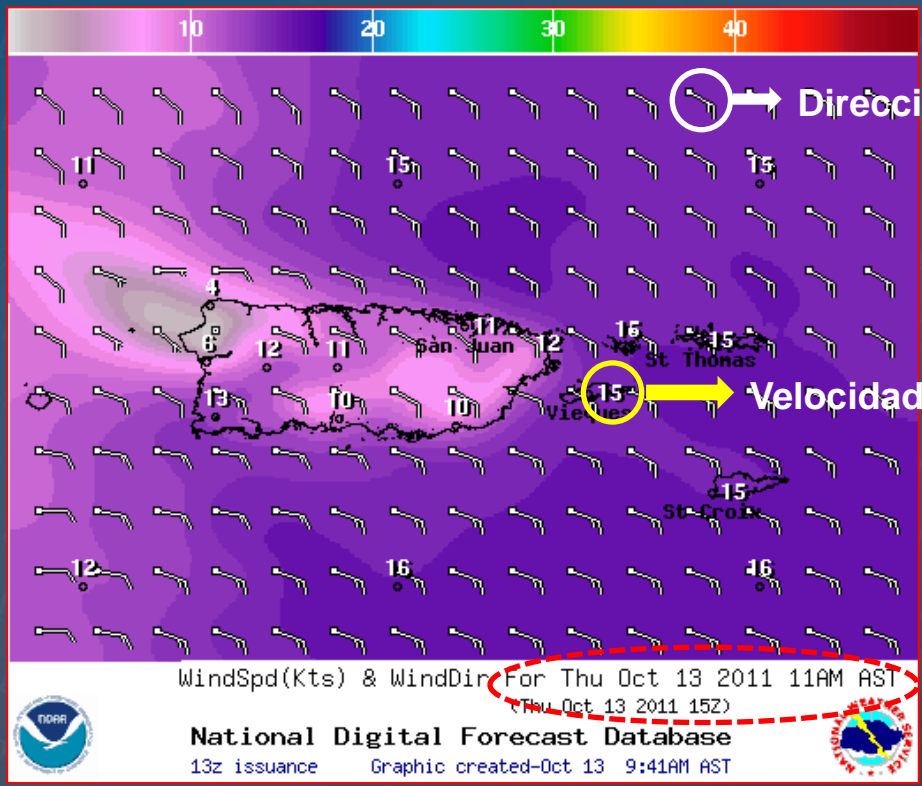
CariCOOS Buoys Models Marine Conditions

San Juan Ponce Rincon USVI Wind Fros SWAN AMSEAS Ocean Color NWS - Frost Hurricane Season

Click the arrows for data and graphs

Wind Observation Wave Observation Wave Forecast Surface Current Observation Tidal Current Forecast Missing Data

Winds (Kts): Waves (ft): Currents:

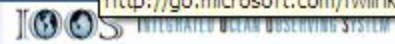


Día & hora
pronóstico

Tutorial de Viento:
http://storage.caricoos.org/tutorial/Espanol/Viento/NWS_Wind_Forecast/player.html

Boyas de CariCOOS

Web Slice Gallery
<http://go.microsoft.com/fwlink/?LinkId=121315>

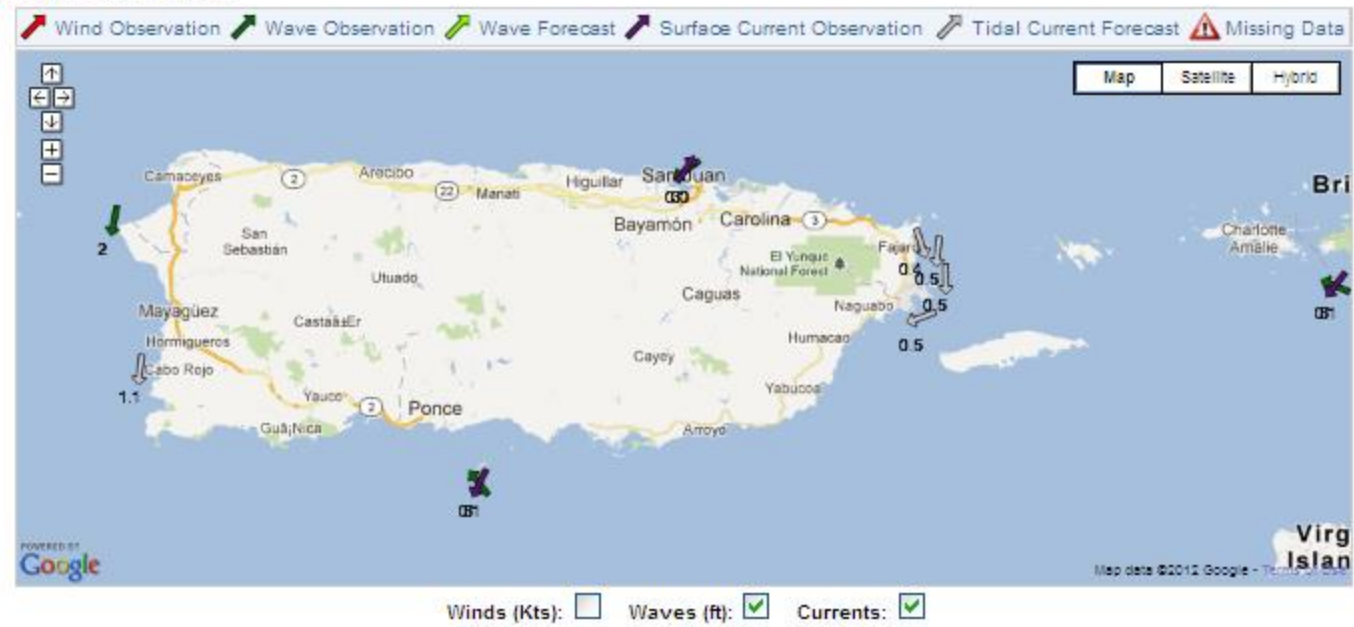


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CariCOOS Buoys				Models			Marine Conditions		
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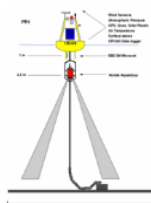
Click the arrows for data and graphs



Ponce

Mooring PR105 : CariCOOS Data Buoy A

Latitude: 17° 51.61'N
Longitude: 66° 31.42'W
Location Description: Southeast of Caja de Muertos Island
Deployed: May 29 2012
Coast Guard Light List Letter: A
Coast Guard Light List Number:
Water Depth: 18 meters (59 feet)
Watch Circle Radius: 60 meters (197 feet)
Last Cell Phone Transmission: Aug 13, 09 AM AST
Last GOES Transmission: Aug 13, 09 AM AST
Latest Event:
 May 29, 08 AM AST
 Redeployed by CARICOOS.



Boyas de CariCOOS

Datos actualizados

Significant Wave Height
Maximum Wave Height
Mean Wave Direction

Wind Direction
Wind Speed

Variable (measurement depth in meters)	Last Observation	Last Update (AST)	Most Recent Data Plot	Full Deployment Plot	Full Historical Plot	Make My Own
Significant Wave Height (0m)	1.4 meters (4.6 ft)	Aug 13 9:00 AM				
Maximum Wave Height (0m)	2.1 meters (7.0 ft)	Aug 13 9:00 AM				
Dominant Wave Period (0m)	8.3 seconds	Aug 13 9:00 AM				
Mean Wave Direction (0m)	128.5 degrees	Aug 13 9:00 AM				
Mean Wave Direction Spread (0m)	28.0 degrees	Aug 13 9:00 AM				
Significant Wave Height (alt) (0m)	1.6 m	Aug 13 9:30 AM				
Dominant Wave Period (alt) (0m)	8.0 seconds	Aug 13 9:30 AM				
Air Temperature (-3m)	29.1 C (84.3 F)	Aug 13 9:30 AM				
Barometric Pressure (-3m)	1016.0 millibars	Aug 13 9:30 AM				
Wind Direction (-4m)	East	Aug 13 9:30 AM				
Wind 2 Direction [Primary] (-4m)	East	Aug 13 9:30 AM				
Wind Speed (-4m)	8.7 m/s (19 mph, 17 kts)	Aug 13 9:30 AM				
Wind 2 Speed [Primary] (-4m)	8.7 m/s (20 mph, 17 kts)	Aug 13 9:30 AM				
Wind Gust (-4m)	10.3 m/s (23 mph, 20 kts)	Aug 13 9:30 AM				
Wind 2 Gust [Primary] (-4m)	10.4 m/s (23 mph, 20 kts)	Aug 13 9:30 AM				
Water Temperature (1m)	28.9 C (83.9 F)	Aug 13 9:00 AM				
Salinity (1m)	34.9 psu	Aug 13 9:00 AM				
Sigma-T (1m)	22.1 kg/m³	Aug 13 9:00 AM				
Current Direction (2.5m)	SE	Aug 13 9:00 AM				
Current Direction (4m)	SE	Aug 13 9:00 AM				
Current Direction (5m)	ESE	Aug 13 9:00 AM				
Current Direction (6m)	ESE	Aug 13 9:00 AM				
Current Direction (7m)	ESE	Aug 13 9:00 AM				
Current Direction (8m)	SE	Aug 13 9:00 AM				
Current Direction (9m)	ESE	Aug 13 9:00 AM				
Current Direction (10m)	SE	Aug 13 9:00 AM				
Current Direction (11m)	SE	Aug 13 9:00 AM				
Current Direction (12m)	SE	Aug 13 9:00 AM				
Current Direction (13m)	ESE	Aug 13 9:00 AM				
Current Direction (14m)	ESE	Aug 13 9:00 AM				
Current Direction (15m)	ESE	Aug 13 9:00 AM				
Current Direction (16m)	ESE	Aug 13 9:00 AM				
Current Speed (2.5m)	9.2 cm/s (0.18 kts)	Aug 13 9:00 AM				
Current Speed (4m)	6.3 cm/s (0.12 kts)	Aug 13 9:00 AM				
Current Speed (5m)	8.9 cm/s (0.17 kts)	Aug 13 9:00 AM				
Current Speed (8m)	13.4 cm/s (0.24 kts)	Aug 13 9:00 AM				

Latest Conditions and Forecast

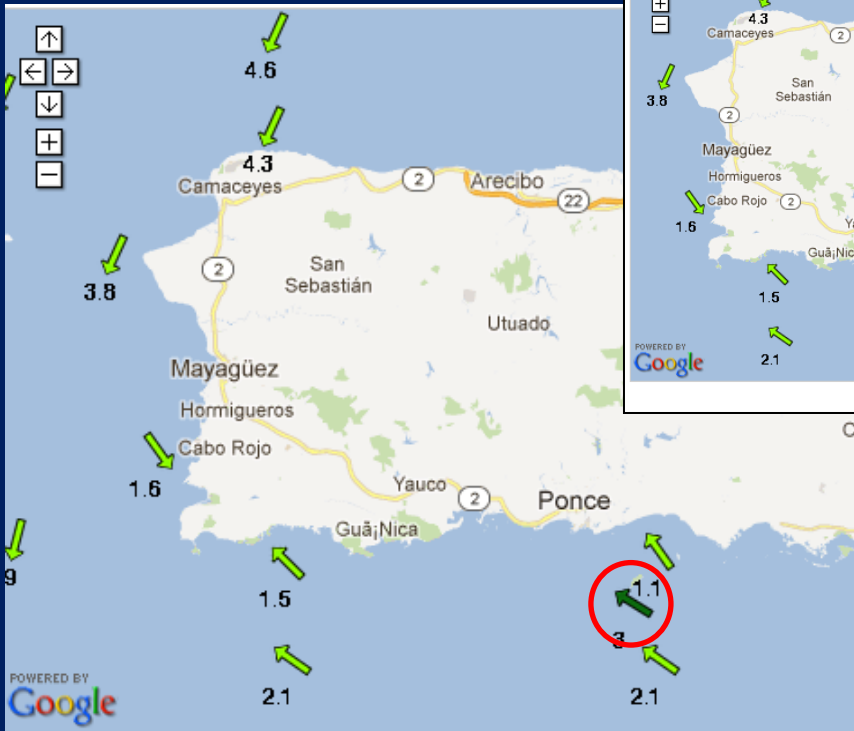
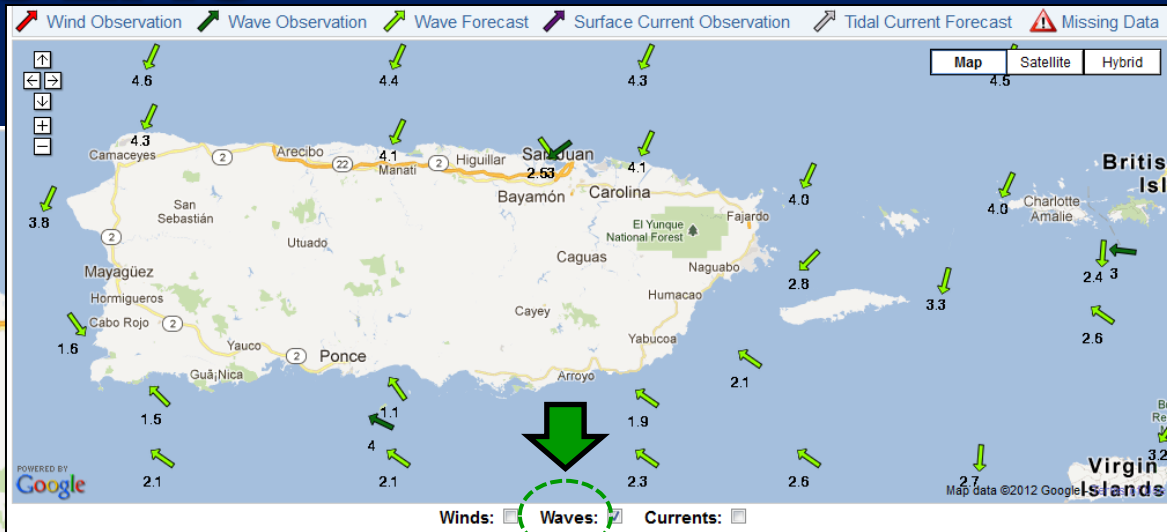
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San Juan	Ponce	Rincon	USVI	Wind Frcs	SWAN	AMSEAS	Ocean Color	NWS - Frost	Hurricane Season

Click the arrows for data and graphs



Evaluar los datos de tamaño y dirección de olas a tiempo real y pronósticos.

3 Mapa de OLAS



**Observaciones
(Boyas CariCOOS)**

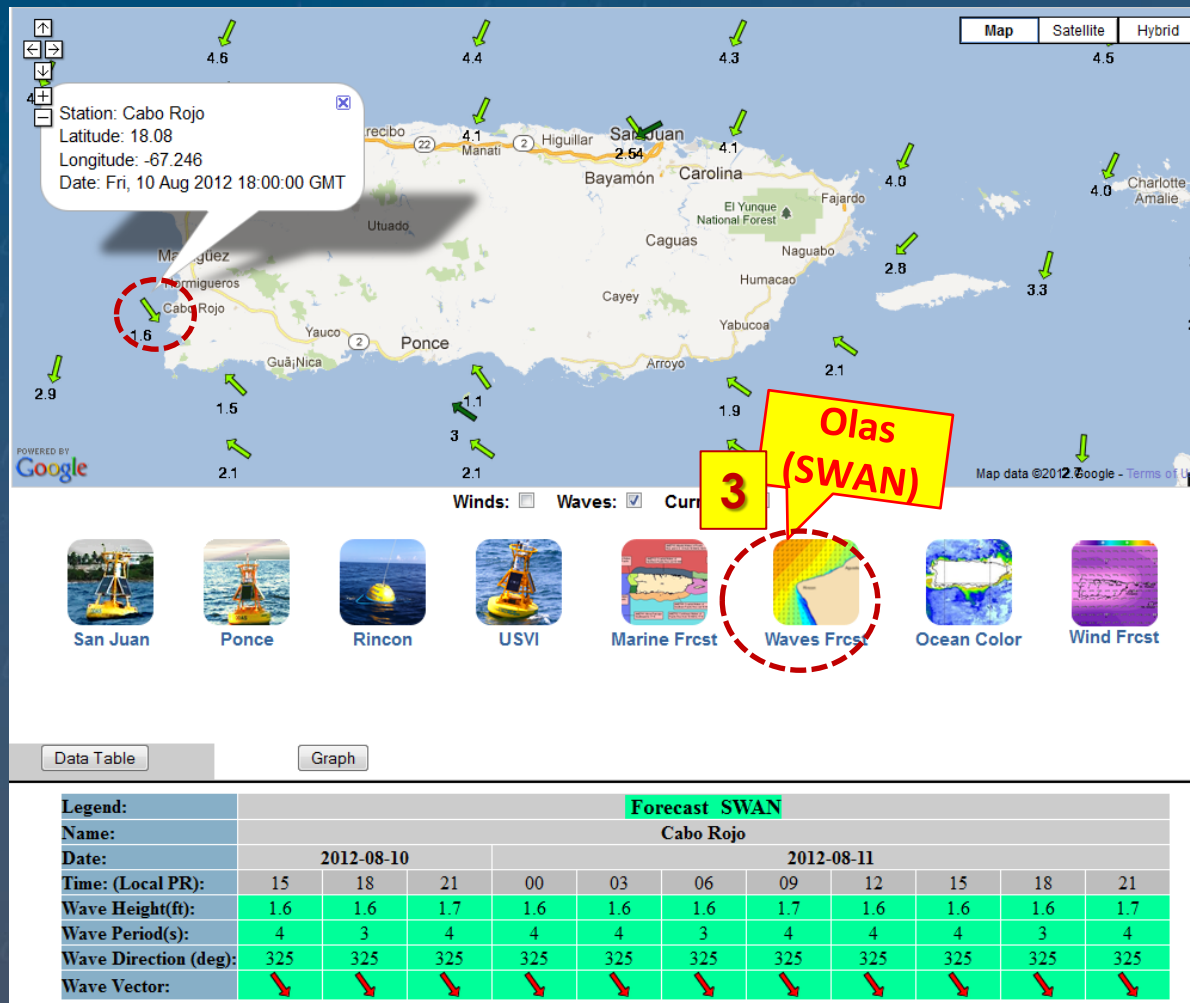


**Pronósticos
(SWAN)**

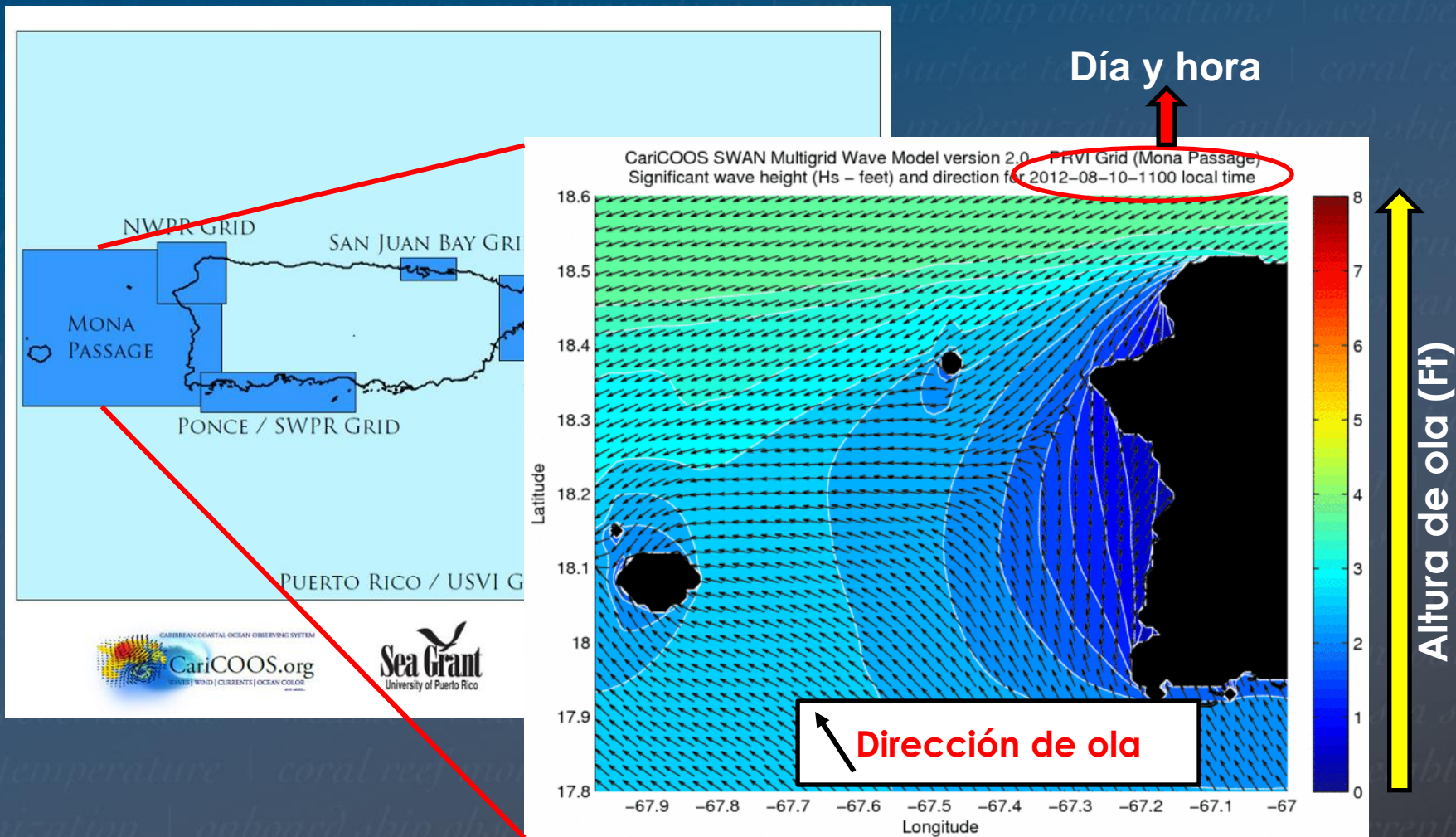
Legend:		Observation											
Name:		CarICOOS Buoy Ponce											
Date:		2012-08-10											
Time: (Local PR):		02	03	04	05	06	07	08	09	10	11	12	13
Fecha	→												
Hora	→												
Altura	→	2.0	2.0	2.0	2.0	2.0	2.3	2.3	2.6	3.0	3.3	3.0	2.6
Periodo	→	4	5	5	5	5	5	4	4	4	4	4	4
Dirección	→	134	140	142	138	134	136	132	132	128	128	122	124
	→	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖

Observaciones de altura, periodo y dirección de las olas para las estaciones de interés

Pronóstico de altura, periodo y dirección de olas



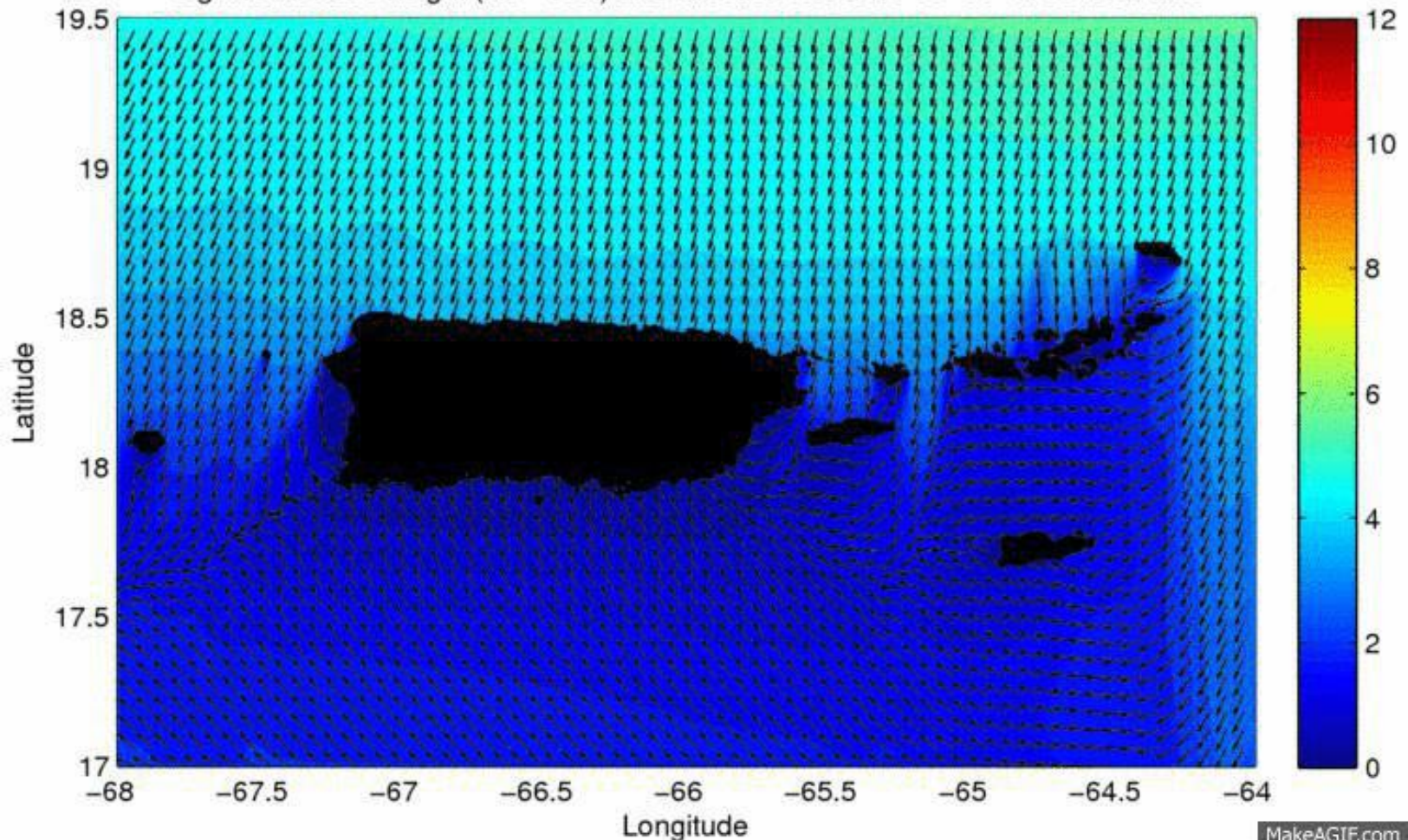
3 SWAN: Pronóstico gráfico de olas



Modelo SWAN adoptado por Servicio Nacional de Meteorología

Animación SWAN

CariCOOS SWAN Multigrid Wave Model version 2.0 – PRVI Grid
Significant wave height (H_s – feet) and direction for 2012-09-06-1700 local time



CariCOOS - Educación

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CariCOOS Buoys **Models** **Marine Conditions**

San Juan Ponce Rincon U.S.V.I. Wind Fries SWAN AMSEA 8 Ocean Color NWS - Frost Hurricane Season

Click the arrows for data and graphs

Wind Observation Wave Observation Wave Forecast Surface Current Observation Tidal Current Forecast Missing Data

Map Satellite Hybrid

Winds (Kts): Waves (ft): Currents:

Data Table Graph

Click the arrows on the map above to view more information.

Modulo **Tutorial**

Climas Costeros Viento Olas

Modulo **Tutorial**

Climas Costeros

Viento

Olas

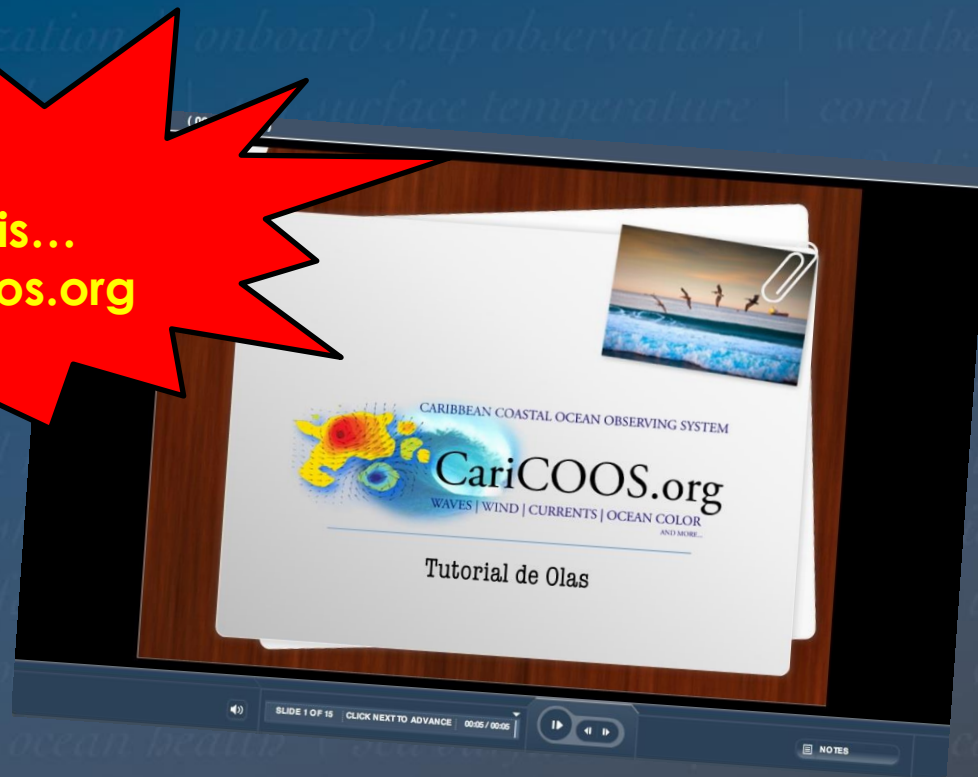
CariCOOS: Materiales Educativos



Climas Costeros de Nuestras Islas

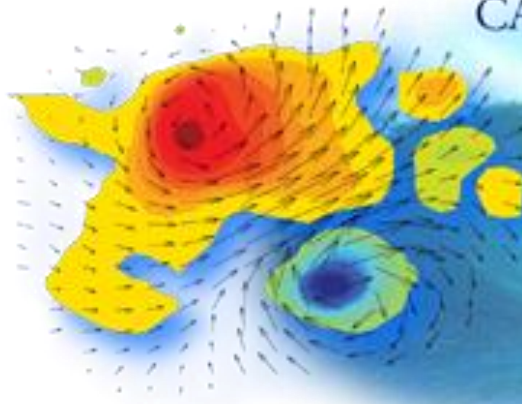
- Conceptos básicos del clima costero y como afectan las actividades en la zona costera.
- Destrezas para interpretar mapas y productos de clima costero (olas, vientos, corrientes).
- Ayuda para tomar decisiones informadas .
- Prevención de accidentes en la zona costera.

Gratis...
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Tutoriales: olas y viento

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GRACIAS!

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Education & Outreach coordinator
CariCOOS