Coastal Data Information Program (CDIP)

Measuring, Modeling, and Forecasting Waves on the California Coast

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BUOY ARRAY

The Coastal Data Information Program's network of Datawell Waverider buoys has grown to > 85 active stations nationwide, spanning Hawaii/Pacific, CONUS, Alaska, PR.

DATA ACQUISITION

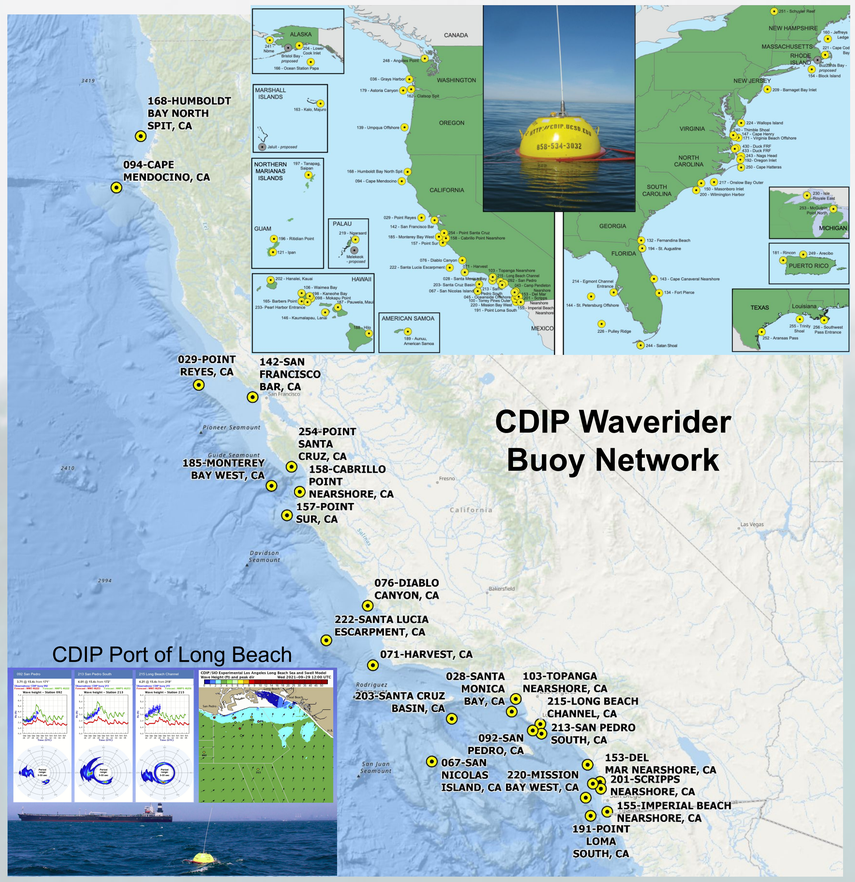
- Wave height, period, direction, sea surface temperature
- Available as directional spectra, parameters, time series of displacements, with myriad detailed metadata
- Newest generation of buoys includes sensors for surface current speed and direction, and air temperature
- Robust hardware for 2-3 year deployment duration

DATA DISSEMINATION

- Buoys report data every 30 minutes via Iridium (> 99% reliable)
- CDIP website receives ~20k unique visitors per day
- All CDIP buoy data, real time and archived, are available via fully compliant NetCDF (THREDDS, ERDDAP)
- Following QC, data disseminated in near real time to NOAA/NDBC, and onward to NWS, NOAA PORTS, IOOS RA data portals, etc.
- Monthly NCEI accession

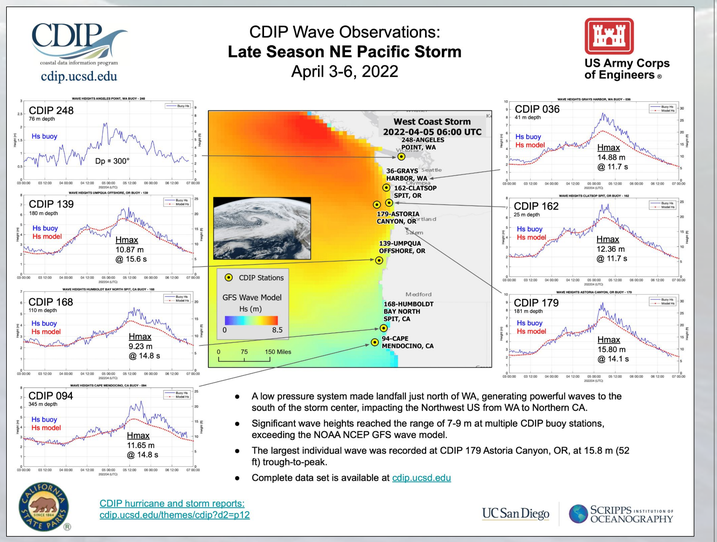
QA/QC

- CDIP, in close partnership with Datawell, serves as the national testing and calibration facility for Waveriders
- Heave accurate to 2%, direction to 2 degrees
- SST sensor is verified within ±0.2 °C. Air temp also verified
- Automated QC of real-time data with detailed flags
- Human-in-the-loop QC daily / weekly / upon buoy recovery
- CDIP is deeply involved in QARTOD



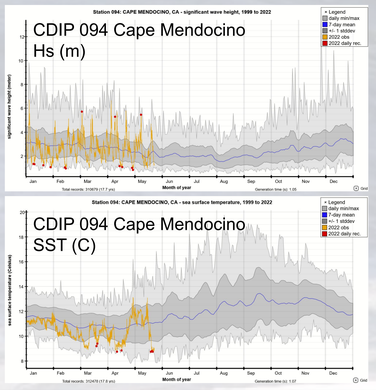
EXTREME EVENTS

- CDIP issues wave event bulletins to regional stakeholders following energetic events



Longterm Monitoring

- Climatology plots and information available on demand at cdip.ucsd.edu

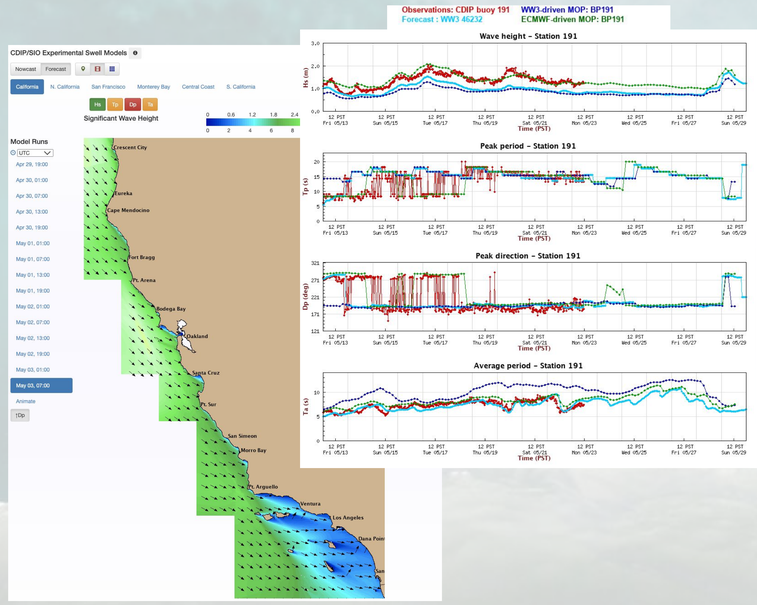


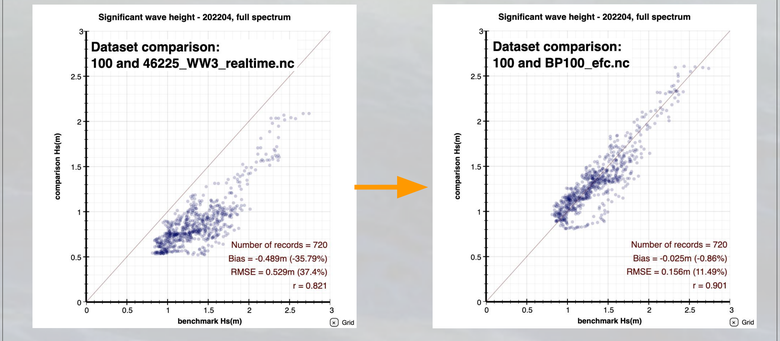
IMPROVED FORECAST

In March 2021, NOAA / NCEP's operational wave model was updated to utilize Global Forecast System (GFS) forcing. While this improved wave forecast validation results globally overall, it introduced a significant low bias in wave energy offshore California. This bias negatively affected CDIP's California wave forecast, and the automated sea state and inundation alerts derived from it.

In 2021, CDIP also began investigating and ingesting ECMWF (European Centre for Medium-Range Weather Forecasts) global model forecast data. Using this instead to force the CDIP wave model was found to significantly improve wave forecast validation results, removing the regional energy bias.

As of May 2022, ECMWF-driven CDIP wave model forecasts are being displayed on CDIP web pages.





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The rest of the CDIP Waves team:

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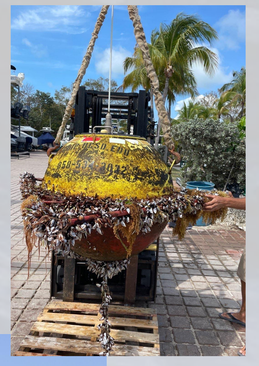

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