The Ocean Color Component of the Aerosol Robotic Network (AERONET-OC) was conceived to support the validation of satellite ocean color data products such as normal water leaving radiance and aerosol optical thickness through autonomous radiometric measurements performed from offshore platforms. The network, established in 2002 in collaboration with the Joint Research Centre of the European Commission, currently includes more than 20 globally distributed sites located in different marine regions. AERONET-OC data are presently operationally applied by NASA to assess data products from a number of ocean color sensors (e.g., the Ocean Land Color Imager (OLCI) onboard Sentinel-3, the Visible Infrared Imaging Radiometer Suite (VIIRS) onboard the NOAA-20 satellite and the Suomi National Polar-Orbiting Partnership (Suomi NPP) spacecraft). AERONET-OC Version 3 will be released later in 2018. It will improve calibration, quality assurance and support new measurements over fresh water.
References:

Data Sources: VIIRS and AERONET-OC data from the AAOT site in the northern Adriatic Sea. Matchups (i.e., quasi-coincident satellite and in situ data) for the period October 2011 - December 2017 were constructed allowing a maximum time difference of +/- 1hr between in situ measurements and satellite overpass.

Figure 1: AERONET-Ocean Color sites are located offshore at marine and fresh-water platforms

Figure 2: AERONET-Ocean Color data

Technical Description of Figures: Fig. 1 shows the geographical distribution of AERONET-OC sites (see https://aeronet.gsfc.nasa.gov/cgi-bin/draw_map_display_seaprism_v3). The inset in Fig.1 displays the “Aqua Alta Oceanographic Tower (AAOT)” in the northern Adriatic Sea and the two AERONET-OC units operated on it. This AERONET-OC site was the first established in the network and serves specific investigations on measurement protocols and uncertainty analysis. Fig.2 illustrates the performance of VIIRS \( \text{L}_{\text{WN}}^{\text{VIIRS}} \) data at different bands (i.e., those centered at 410, 443, 486 and 551 nm) with respect to AERONET-OC \( \text{L}_{\text{WN}}^{\text{OC}} \) reference values. Note that \( \text{L}_{\text{WN}} \) expresses the water leaving-radiance \( \text{L}_w \) that would occur with no atmosphere, the sun at the zenith and at the mean sun-earth distance. Units are in mW cm\(^{-2}\) \( \mu \text{m}^{-1} \) sr\(^{-1}\). Horizontal bars indicate the estimated uncertainties in AERONET-OC \( \text{L}_{\text{WN}} \) data while vertical bars indicate \( \pm 1 \) standard deviation of the 3×3 VIIRS image elements centered at the AAOT and utilized for computing the average VIIRS \( \text{L}_{\text{WN}} \) applied for the comparison. N indicates the number of match-ups and rmsd the root-mean-square of differences.

Scientific significance, societal relevance, and relationships to future missions: The construction of Climate Data Records requires a number of actions allowing the scientific community to merge multiple mission data into a single stream applicable for climate science. Among these actions, in situ reference data for the assessment of satellite data products are of fundamental importance. AERONET-OC is an effective infrastructure supporting the continuous validation of satellite ocean color missions with real-time data. Uncertainty of these products is reduced with the improved AERONET Version 3 processing for atmosphere, land and ocean color applications.