1. Introduction
CDIAC’s ocean carbon data collection includes discrete and underway measurements from a variety of platforms (e.g., research ships, commercial ships, buoys). The measurements come from deep and shallow waters from all oceans. Technological advances make it possible to deliver ocean carbon data real-time but questions about instrument reliability and data quality limit this practice at this moment. All ocean carbon data CDIAC receives come from individual investigators and groups following initial data review.

2. Ocean CO₂ data from Oceanographic Ships and Other Platforms

World Ocean Circulation Experiment (WOCE) WOCE was a major component of the World Climate Research Program with the overall goal of better understanding the oceans role in climate and climatic changes resulting from both natural and anthropogenic causes. The CO₂ survey took advantage of the sampling opportunities provided by the WHP during this period between 1990 and 1998. The final data set covers approximately 23,000 stations from 94 WOCE cruises. http://cdiac.ornl.gov/oceans/Coastal/

Global Ocean Carbon and Repeat Hydrography Sections The Global Ocean Carbon and Repeat Hydrography Program carries out a systematic and global re-occupation of select WOCE/JGOFS hydrographic sections to quantify changes in storage and transport of heat, fresh water, carbon dioxide (CO₂), and related parameters. The high-quality discrete measurements of carbon-related parameters are available via CDIAC Repeat Hydrography web site (http://cdiac.ornl.gov/oceans/RepeatSections/)

Global Volunteer Observing Ships (VOS) Project The VOS project is coordinated by the International Ocean Carbon Coordination Project (IOCCP). The high-quality measurements of carbon-related parameters from the ocean CO₂ data are now available from the CDIAC VOS web site http://cdiac.ornl.gov/oceans/VOS_Program/

Global CO₂ Time-series and Moorings Project The international groups from 18 countries have mounted sensors on moored buoys to provide high-resolution time-series measurements of atmospheric boundary layer and surface ocean CO₂ partial pressure (pCO₂). The CO₂ Time-series and Moorings Project is also coordinated by IOCCP. The high-quality measurements of carbon-related parameters from the Moorings are available via CDIAC Time-series and Moorings Project web site http://cdiac.ornl.gov/oceans/Moorings/

Global Coastal Carbon Data Project The coastal regions data are very important for the understanding of carbon cycle on the continental margins. The Coastal Project data include the bottle (discrete) and surface (underway) carbon-related measurements from coastal research cruises, the data from time series cruises and coastal moorings. The data from US East Coast, US West Coast, and European Coastal area are available from CDIAC Global Coastal Carbon Data Project Web site http://cdiac.ornl.gov/oceans/Coastal/

3. Ocean Carbon Data Synthesis Projects

Global Ocean Data Analysis Project (GLODAP) Published at CDIAC in 2004. GLODAP is a cooperative effort of investigators funded for synthesis and modeling projects through the National Oceanic and Atmospheric Administration (NOAA), DOE, and the National Science Foundation (NSF). Cruises conducted as part of the WOCE, JGOFS, and the NOAA Ocean-Atmosphere Carbon Exchange Study (OACES) over the decade of the 90s have generated oceanographic data of unparalleled quality and quantity. As of today, the GLODAP database consists of data from 94 WOCE, JGOFS, and other international and historical cruises. http://cdiac.esd.ornl.gov/oceans/glo dap/Carbon in the Atlantic Ocean (CARINA) CARINA database was published at CDIAC in 2009 and consists of data from 188 cruises. CARINA started as the International Project, which emerged from a workshop on “CO₂ in the North Atlantic Ocean,” held in June 1999 in Darmenhorst, Germany and continued throughout of the EU CARBOOCEAN Project. The data and metadata from the CARINA individual cruise data and database are now available from the CDIAC CARINA web site (http://cdiac.ornl.gov/oceans/CARINA/) and from the WAVES search system.

PACIFICA Database Published at CDIAC in 2013. The work on the Pacific Ocean Carbon data assembly, data analysis and data synthesis started in 2007 as a part of North Pacific marine Science Organization (PICES) Carbon & Climate Group (C&CG) project. We planned to work on the PACIFICA database for at least 3 years, as this is completely volunteer work for all members of PICES C&CG. The final database will include all cruises in the Pacific Ocean that were not included in the GLODAP database. The data and metadata from the PACIFICA individual cruise data and database are now available from the CDIAC PACIFICA web site (http://cdiac.ornl.gov/oceans/PACIFICA/) and from the WAVES search system.

LDEOv2012 Database Approximately 6.4 million measurements of surface water partial pressure of CO₂ (pCO₂) obtained over the global oceans during 1957-2012 are listed in the Lamont-Doherty Earth Observatory (LDEO) database, which includes open ocean and coastal water measurements. The data presented in this database include the analyses of partial pressure of CO₂ (pCO₂), sea surface temperature (SST), sea surface salinity (SSS), pressure of the equilibrium, and barometric pressure in the outside air from the ship’s observation system. The data and metadata from the LDEO Database are now available from the Global Surface pCO₂ (LDEO) Database web page (http://cdiac.esd.ornl.gov/oceans/LDEO_Underway_Database/) and from the WAVES search system.

The new database GLODAPv2 will be published at CDIAC in 2014

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