

DDC Report 2017 of WDCC

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Author team:	M. Stockhause, M. Lautenschlager	
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1. Summary

The total AR5 data volume provided by IPCC DDC is 1.7 PBytes, 1.6 PBytes in the DDC AR5 Reference Archive and 100 TBytes in the IPCC AR5 WG1 Archive, compared to about 1 TBytes for AR4, and less than 10 GBytes each for the preceding ARs: FAR, SAR, and TAR.

In 2017 IPCC DDC users downloaded ca. 3.5 PBytes of data in over 1.4 million individual file downloads, which is an increase of about 32 % of the downloaded files and about 240 % of the downloaded volume compared to 2016. Responsible for this increased download volume was mainly the month 05/2017. The download rates from the IPCC DDC reference archive were dominated by AR5 downloads. AR4 data download decreased again from 2016 to 2017 to become insignificant in the total download volume from the IPCC DDC in 2017.

620 WDCC users plus an unknown number of ESGF users accessed IPCC DDC data in 2017. This number of active users decreased by 17 % compared to 2016. As the ESGF users, for which no geographical location of the user is known, dominate the data downloads, a reliable estimation of the geographical distribution of the users is not possible for 2017. Next year ESGF will provide download statistics. The average number of downloads for an individual IPCC DCC user was ca. 2 300 files, which is an increase of ca. 1/3 compared to 2016.

The offer to send data for selected areas on storage media was requested by 13 users, mostly located in developing or economy-in-transition countries.

2. Evolution of data access

In the user downloads from the DDC reference archive, the download rates peaked in 05/2017 with a download volume of over 2 PBytes (**Figure 1**). The reason is unknown. This month is responsible for an increased total data download volume from 2016 with ca. 1 PByte to 2017 with ca. 3.5 PBytes. Apart from 05/2017, no overall tendency in the monthly downloads is shown over the three years period. Downloads remain on a high level. The mean monthly download rate for 2017 is ca. 300 TBytes/month.

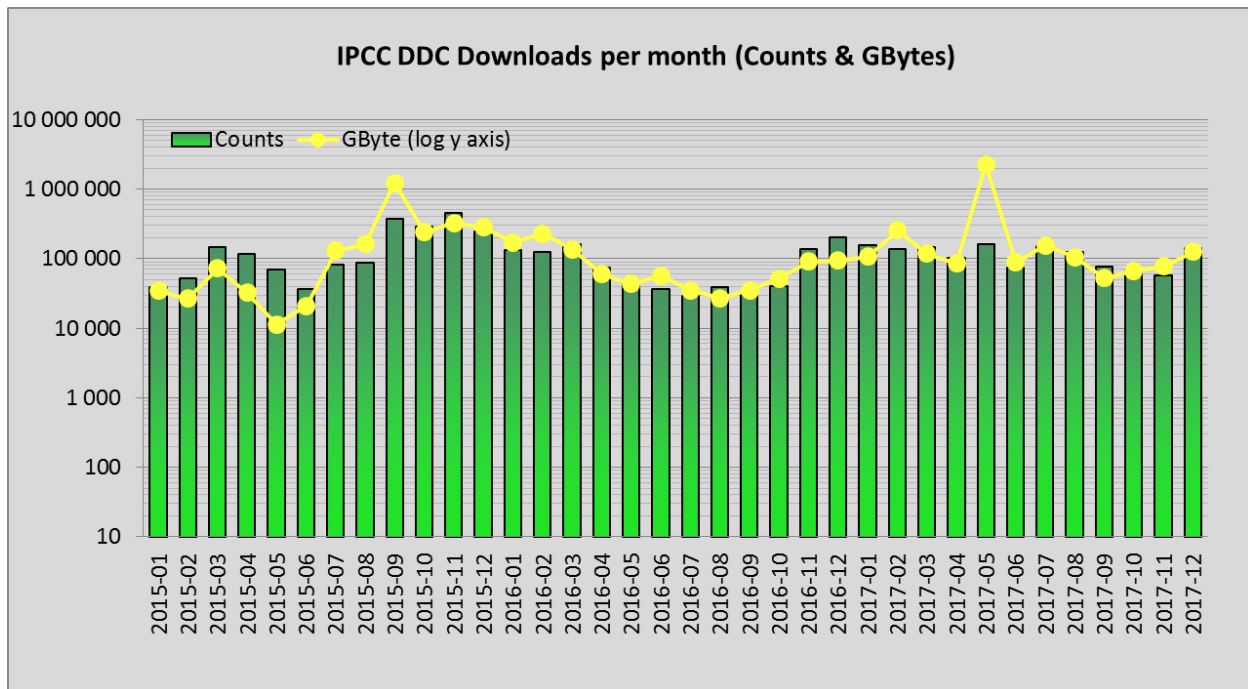


Figure 1: Total data download counts and volumes per months over the last three years in GBytes from the IPCC DDC reference archive.

3. Geographical distribution of data access

For the IPCC DDC AR5 data, direct data access at the WDCC and data access via ESGF (Earth System Grid Federation) is supported. For the ESGF data access share, no information about user locations is available.

About 1/2 of the registered active users were located in Asia and 1/4 in Europe. Accordingly, the share of users located in developing or economy-in-transition countries (Asia, South America, and Africa) was more than 50 % (**Figure 2**, bottom). The number of active users decreased by 17% from 728 in 2016 to 620 in 2017. The average user in 2017 was more active than in 2016. The number of file downloads per user increased by 1/3 from ca. 1 500 to 2 300 (**Figure 2**, top). A high percentage of the data (ca. 2/3) is downloaded via the ESGF, for which no user locations are recorded. Therefore no reliable overall geographical distribution of the IPCC DDC users can be provided for 2017. As the ESGF is currently finalizing a user statistic dashboard, this data should be available for 2018.

Assuming the same geographical distribution for the ESGF data users as for the WDCC data users results in ca. 50 % Asian, 1/3 European and 1/8 North American users. The percentage of file downloads to developing and economy-in-transition countries (Asia, Africa, and South America) was about 56 % and highly dominated by Asian user.

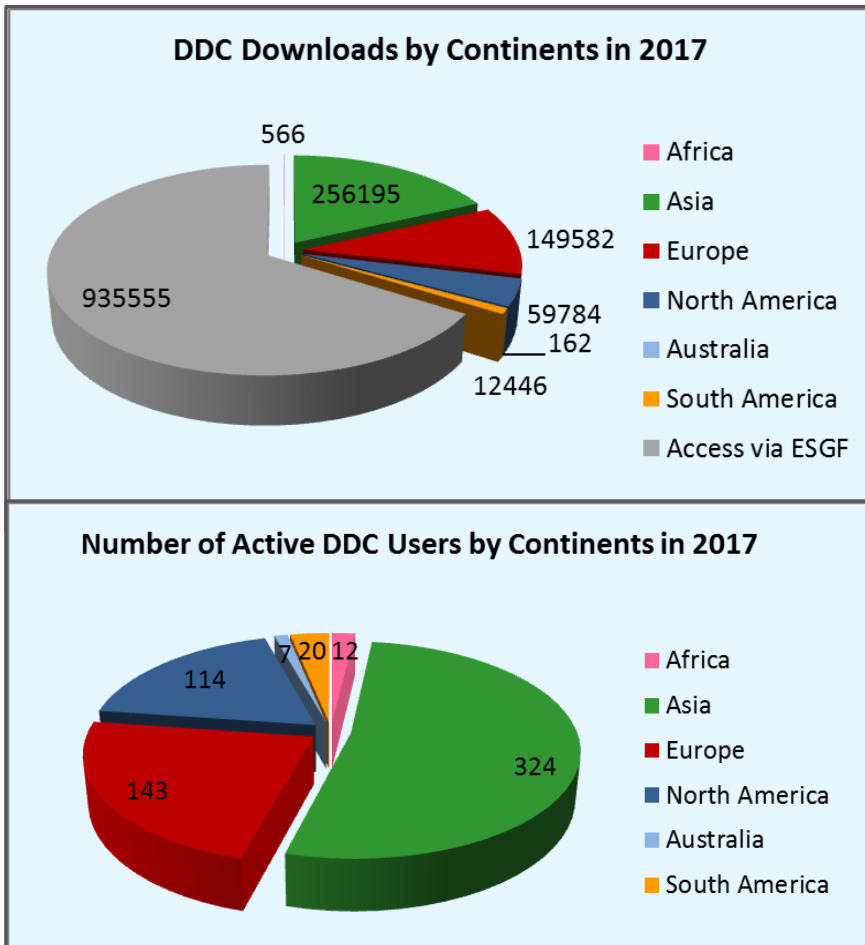


Figure 2: Number of active DDC users in 2017 (bottom) and downloads counts of users per continent (top).

3.1 Data on storage media

The interest in the DDC service to send a data subset for a geographical area on storage devices by mail doubled in 2017 compared to 2016. 23 USB devices were sent to 13 users in 2017. Nearly all users requested AR5 data, only one asked for AR4 data. The majority of the users (11) were located in developing or economy-in-transition countries (see **Table 1** and **Table 2**). Accordingly, the most interest was in the climate data for Asia and Africa data (14 USB devices). Together with the 3 USB device with data for South America, the percentage of USB devices with data from developing and economy-in-transition countries adds up to ca. 74 % of the overall send devices.

In addition to these numbers, USB devices are also shared among colleagues. Therefore there might be an unknown number of additional users, using AR4 and AR5 data for the regions on USB devices instead of directly downloading it from WDCC.

Table 1: Number of storage media requests per data area for AR4 and AR5 in 2017.

Area of Data	No of storage media	Africa	Asia	Australia / Central Pacific	Europe	North America	South America	North Pole	South Pole
AR4	1	1	-	-	-	-	-	-	-
AR5	22	5	8	1	2	1	3	1	1
DDC total	23	6	8	1	2	1	3	1	1

Table 2: Number of user requests for AR4/AR5 data on storage media per user origin (continent) in 2017.

User origin	No of users	African users	Asian users	South American users	Australia / Central Pacific	European users
AR4	1	-	-	-	-	1
AR5	12	1	8	2	1	-
DDC total	13	1	8	2	1	1

4. Data access by category AR

The monthly download rates in 2017 from the IPCC DDC reference archive were dominated by AR5 downloads. AR4 data download decreased again from 3 % of the total number of downloaded files in 2016 to < 1% of the total file download in 2017. The downloaded volume of AR4 data in 2017 is insignificant compared to the AR5 data download volume (**Figure 3**; online monthly download statistics¹). Downloads of SAR and TAR data in 2017 remain in the same order as for 2016.

5. Review of user queries

There are no numbers for the handled user requests by WDCC/DKRZ staff available for 2017, same as for 2016. A separation of user requests on IPCC DDC issues is not possible.

As the IS-ENES support activity has ended, no ESGF user statistics are available for 2017.

In parallel to the regular user support channels, additional requests were directed to individuals at the modelling centres or at the data centres (within ESGF or to WDCC/DKRZ).

¹ Online monthly download statistics are available at:

https://cera-www.dkrz.de/WDCC/ui/cersearch/statistics?type=downloads_by_domain&domain=IPCC-DDC

https://cera-www.dkrz.de/WDCC/ui/cersearch/statistics?type=downloads_by_domain&domain=IPCC-DDC_AR5

https://cera-www.dkrz.de/WDCC/ui/cersearch/statistics?type=downloads_by_domain&domain=IPCC-DDC_AR4

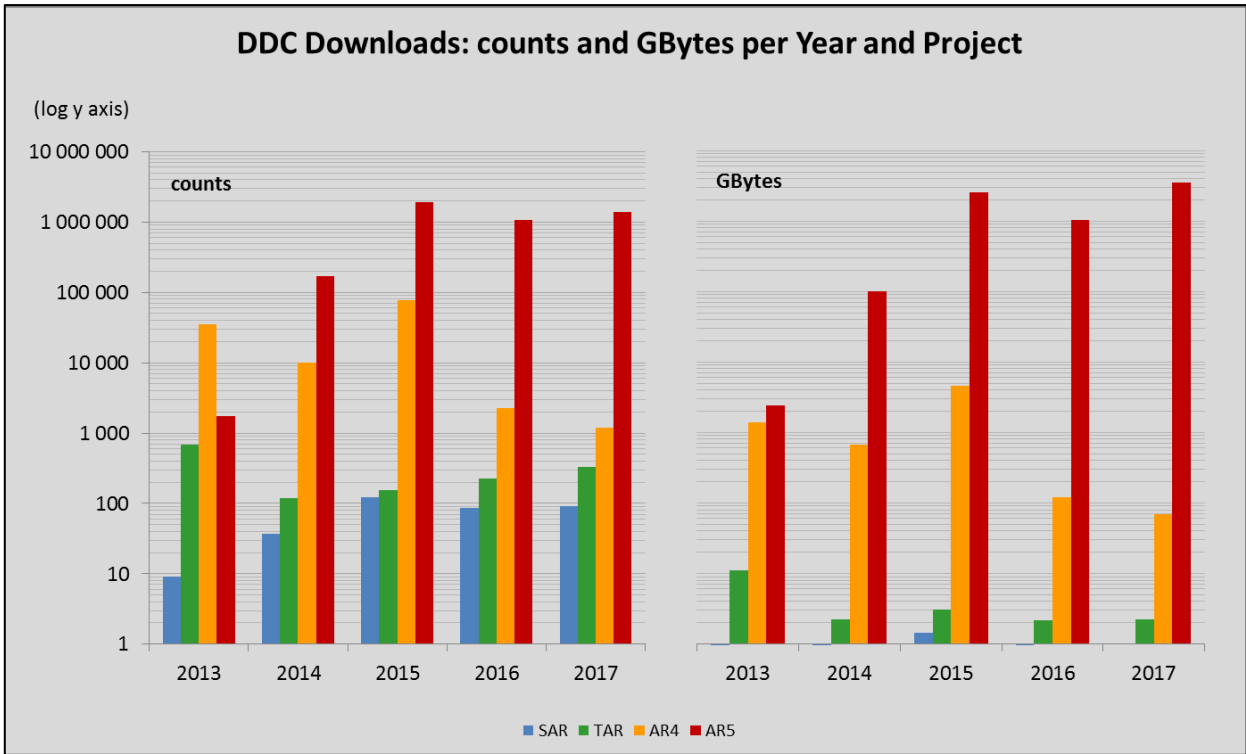


Figure 3: Total annual data download counts (left) and volumes in GBytes (right) over the last five years for the different DDC reference archives (without FAR).