Glossary of Methodological Terms

The following alphabetically arranged index of key terms provides further information about the sources of data used for the Funding Atlas and the methods used for data preparation and analysis.

AiF funding

The German Federation of Industrial Research Associations (AiF) implements the Industrial Collective Research (IGF) funding programme of the Federal Ministry for Economic Affairs and Energy (BMWi), which is covered in this Funding Atlas in section 4.6 “Funding profiles in the engineering sciences” (see Table Web-58 at www.dfg.de/funding atlas). The analyses of funding in the IGF programme are based on data relating to ongoing and completed R&D projects within the three-year period from 2014 to 2016, which is made available by the AiF as a special evaluation. AiF funding recipients were assigned to universities and research institutions in accordance with the DFG institutions database. In this edition of the Funding Atlas, the Central Innovation Programme for SMEs – Cooperation (ZIM-KOOP), considered in previous editions jointly with the IGF funding programme, has been included in Federal funding along with all funding lines of the ZIM programme.

AvH funding

Funding from the Alexander von Humboldt Foundation (AvH) refers to the number of funded visits by visiting researchers during the five-year period from 2012 to 2016. This longer period (as with DAAD funding) ensures that annual random effects carry less weight. The data includes both research fellows and Humboldt prize recipients.

In these statistics, two things should be noted with regard to the definition of the term ‘AvH-funded’. Firstly, visits to German research institutions by visiting researchers of one month or more are counted. Secondly, an AvH fellowship or award may be split over multiple visits to one or more German host institutions. In cases where more than one visit was completed at the same institution as part of a fellowship or award, this is counted here as one visit. On the other hand, if visits to various institutions have taken place as part of a fellowship or award, these are counted as separate visits.

In some cases, multiple fellowships and/or awards may also have been awarded to the same individual during the five-year period. If an individual received multiple fellowships and all were used to visit the same host institution in Germany, this is only counted once. On the other hand, if a researcher received one fellowship and one award and chose the same host institution for both, this is counted twice.

Funded visits are classified by the individual researcher’s own subject. AvH-funded visits were assigned to universities and research institutions in accordance with the DFG institutions database.

Cartographic network analyses

For each scientific discipline (Figures 4-4, 4-6, 4-8 and 4-10) and also for the funding instrument of Collaborative Research Centres (Figure 3-5) as well as for the Excellence Clusters in the Excellence Strategy (Figure 3-11), the Funding Atlas shows graphically which universities and non-university research institutions participated in DFG-funded groups between 2014 and 2016 (for Figure 3-11: in 2018). The diagrams illustrate both absolute participation in the funding instruments and joint participation with other research institutions. Participation means that funding was approved (proportionally) for a research group at a given institution.
As the main aim is to illustrate regional focuses and clusters, the focus is on funding instruments that implement the requirement of local concentration or concentration at the applicant university(-ies). I.e. those which, in addition to cooperation within an institution, promote the integration of other universities and non-university research institutions in the local area or wider region. Accordingly, analyses are based on the following funding instruments: Graduate Schools, Clusters of Excellence, Research Centres, Collaborative Research Centres, Research Training Groups and Research Units. Priority Programmes, which are based on nationwide cooperation, are not taken into account.

In the network maps, the diameter of a circle represents the number of participations in relevant DFG research groups. Each participation in a research group is counted only once per institution, regardless of how many at this institution are involved in the same group. The size of the circle increases with the number of groups at the institution in question. Only institutions with at least two participations in a research group are shown (except Figure 3-11, where all institutions are shown). Connecting lines between institutions represent multiple joint participations in a group. The thickness of the lines varies according to the number of joint research groups. It should be noted that the threshold values for the representation of connecting lines were defined separately for each scientific discipline. Threshold value 2 applies to the network representation for the humanities and social sciences and the engineering sciences, and threshold value 3 for the life and natural sciences. This should be noted when comparing the networks for the four different disciplines.

**Correlation coefficient**

The Spearman’s rank correlation coefficient used in the Funding Atlas compares discrete distributions. In the Funding Atlas it is used to compare the order of the series. The value range lies between -1.0 and 1.0. A coefficient of 1.0 means that both series are completely identical; the value -1.0 indicates two completely opposite series.

**DAAD funding**

The funding data evaluated here from the German Academic Exchange Service (DAAD) on individual funding relates to the number of foreign researchers, graduates and doctoral researchers who completed a visit to a German university or research institution during the five-year period from 2012 to 2016. Undergraduates are not taken into account. Only universities and research institutions whose total expenditure in the DAAD funding statement was at least €1 million in each of the five years of the reporting period are considered. This criterion applies to 66 German universities; no non-university research institution met this criterion.

The classification into one of the four scientific disciplines defined by the DFG (see Table 4-1) is based on the subject classification of the visit as supplied by the DAAD. DAAD funding recipients were assigned to universities in accordance with the → DFG institutions database.

**DESTATIS subject classification system**

The subject classification system used by the Federal Statistical Office (DESTATIS) for staff statistics, which also applies in an adapted form to statistics on university finances, students, examinations and doctoral researchers, is used in the → DFG institutions database to classify institutions by subject. The system is divided hierarchically into nine subject groups, 88 teaching and research areas, and 645 subjects (as at 2017). The lowest level, subjects, is identified by four-digit numbers, for example 4215 – economic and social geography (see Table Web-32 at www.dfg.de/fundingatlas).

The recommendations of the German Council of Science and Humanities on the Research Core Data Set, in which the organisational unit is recommended as the primary unit of aggregation and carrier for subject-related information (WR, 2016: 19), also suggest the use of this subject classification system.

**DFG annual survey**

Every year, the DFG carries out a survey of research groups funded through the Excellence Initiative (Graduate Schools and Clusters of Excellence) as well as Collaborative
Research Centres and Research Training Groups (see www.dfg.de/en/dfg_profile/facts_figures/evaluation_studies_monitoring/surveys). The survey is concerned with individuals who belong to a research group. The analyses in the Funding Atlas draw on data from the reporting period of November 2015 to October 2016. They take account of all individuals who participated in the Excellence Initiative, or a CRC or RTG, for at least one month in 2015 and/or 2016.

In the analysis of international cooperation (chapter 5), the countries of origin of participants in 2016 are evaluated. Note that the country of origin does not indicate nationality or country of birth, but the country in which the person was working prior to participation in a research group.

For the mobility analysis of doctoral researchers in Collaborative Research Centres and Research Training Groups (chapter 5), the location of the most recent degree obtained is compared with the current place of research. A distinction can be made between three basic groups of people (see Figure Web-5 at www.dfg.de/fundingatlas):

► Doctoral researchers working on their doctorate in the same Region as that in which they obtained their most recent degree
► Doctoral researchers who obtained their most recent degree in a different region of Germany to that in which they are currently researching
► Doctoral researchers who obtained their most recent degree in another country

**DFG funding**

The DFG funding amounts reported in the Funding Atlas relate to the reporting period from 2014 to 2016. Awards for new proposals, renewal proposals, supplemental proposals and completion funding are included.

The Funding Atlas takes account of the funding instruments and funding lines of individual grants, Coordinated Programmes (Research Centres, Collaborative Research Centres, Priority Programmes, Research Units, Research Training Groups), infrastructure funding and the three funding lines of the Excellence Initiative (Graduate Schools, Clusters of Excellence and Institutional Strategies). Only institutional recipients of funding within Germany are considered. Prizes and the funding of international scientific contacts, committees and commissions, and central research facilities are not included in calculations (see Table 2-1).

The reported funding amounts include the additional funds made available for programme allowances for indirect project costs (see www.dfg.de/en/research_funding/proposal_review_decision/applicants). In comparisons with the expenditure-based statistics on federal and EU funding or the third-party funding data collected by the Federal Statistical Office, it should be noted that the DFG statistics are not expenditure statistics; instead they are based on decision data in the format of ‘awards for a given year’.

An award amount is generally allocated proportionally to the institutions at which the applicants were employed at the time when the funding decision was made.

► In the case of individual grants, the award amount is allocated to the institutions of the (co-)applicants.
► In the case of Collaborative Research Centres, Priority Programmes and Research Units, the award amount is split into individual projects. The amount awarded for a project is allocated to the institution at which the project leader is based. Here is an example. A Collaborative Research Centre consists of ten projects. Project 1 receives €100,000. The total funding amount is allocated to the institution of the single project leader. Project 2 also receives €100,000, but has three project leaders. Here, €33,333 of approved DFG funds is assigned to each of their institutions.
► In the Funding Atlas, award amounts for Research Training Groups are allocated to the institutions of the participating lecturers and other researchers based at non-university research institutions. Here is an example. A Research Training Group is awarded €100,000 for the period 2014 to 2016. The spokesperson and deputy spokesperson are based at University X, as are six other participating lecturers. Two other participating researchers are based at the non-university institutions of Museum A and Max Planck Institute B. €80,000 is therefore allocated to University X and €10,000 each to Museum A and Max Planck Institute B.
► DFG Research Centres are handled in the same way as Graduate Schools and Clusters of Excellence (see Excellence Initiative), i.e. funds are allocated to the institutions of the principal investigators (PI).
**DFG institutions database**

The institutions database maintained by the DFG represents the organisational structure of universities and non-university research institutions – for example faculties, departments or institutes – in terms of their hierarchical structure. To standardise the various names of the institutions for all data used in the DFG Funding Atlas and allow them to be linked, they were used to build a concordance.

As well as additional information such as institution type, the institutions database includes the subject area classification of each institution (in accordance with the DESTA-TIS classification system, see Table Web-32 at www.dfg.de/fundingatlas). It also contains full address data, which is used to georeference the statistical information and represent it cartographically. Extracts from the DFG institutions database can be accessed online via GERIT – German Research Institutions (www.gerit.org).

The analyses presented in chapters 3 and 4 generally apply at the level of the entire institution. All data relating to the funding providers covered by the Funding Atlas has been compiled on the basis of the DFG institutions database. In the case of Graduate Schools and Clusters of Excellence (DFG funding), the information in the institutions database relating to the institution of the principal investigators is used to classify their award amounts by institution and subject area (DFG funding and DFG subject classification system).

The merged university hospitals represent a special case. Where funding or other key figures are reported directly by a university hospital supported by two universities, these are split 50:50 between the partner universities which support it. This applies to Charité Berlin and the university hospitals of Giessen, Marburg and Schleswig-Holstein.

One exception is the Third-party funding adjusted for subject structure at the universities of Kiel and Lübeck (see relevant entries for more details).

**DFG project leaders**

The data basis for this is the participants with leading functions in DFG projects and research groups who obtained approvals for the year 2015. A project – or group – is counted regardless of its duration within the year 2015, i.e. a project/group that ended on 31 January 2015 is counted as one, the same as a project/group that lasted 12 months.

All applicants for individual grants are counted as project leaders. For Collaborative Research Centres, Priority Programmes and Research Units, it is the spokespersons and the leaders of individual projects. In the case of Research Training Groups, it is the participating lecturers and participating researchers. For Graduate Schools, Clusters of Excellence and Research Centres, all principal investigators are treated as project leaders. Institutional Strategies exist across different universities, so as with infrastructure projects, no project participants are listed here.

**DFG subject classification system**

The DFG’s subject classification system is continually adapted on a four-yearly basis in correlation with the elections of DFG review boards. It consists of four levels and, in the version applicable to this Funding Atlas, comprises 213 subject areas which are assigned to 48 review boards. In statistical contexts, to avoid confusion with the statutory bodies, the term ‘research field’ is used rather than ‘review board’. The review boards / research fields are organised into 14 research areas and finally four scientific disciplines. The classification system at the levels of the 48 review boards, 14 research areas and four scientific disciplines is shown in Table 4-1 and the complete classification system of 213 subject areas is shown in Table Web-65 at www.dfg.de/fundingatlas. The DFG classification system is used to classify proposals and the associated award amounts by subject.

- When the DFG receives a proposal for an individual grant, Research Centre (REC), Collaborative Research Centre (CRC), Priority Programme (PRP), Research Unit (RUN) or Research Training Group (RTG), the DFG Head Office decides on the basis of the topic described in the proposal which review board it should be allocated to. Research Centres, Collaborative Research Centres, Priority Programmes and Research Units all consist of multiple projects. Each of these projects is given its own subject classification.
- In the case of Graduate Schools and Clusters of Excellence (see Excellence Initiative), the DFG Head Office has no information on individual projects. Here, the very
extensive funds are distributed using the so-called PI method. For each principal investigator (PI) involved, it is first established at which institute he/she is employed. A subject area is then assigned to this PI on the basis of the institute’s subject classification in the ›DESTATIS subject classification system used in the ›DFG institutions database. Using a concordance of the DFG subject classification system, the project is then classified in one of the DFG research fields. This makes it possible to map the distribution of funding across multiple subject areas with sufficient accuracy even for very intensively financed funding lines.

- Institutional Strategies are not classified by subject because they constitute cross-disciplinary, long-term strategies for top-level research and early career support for the university as a whole.
- Awards for infrastructure funding are also not classified by subject. They are not therefore included in the analyses focusing on subject profiles in chapter 4.

**ERC funding**

The data basis is the Starting Grants, Consolidator Grants and Advanced Grants funding lines. The nine calls published between 2014 and 2016 are taken into account.

The data on ERC funding is taken from the project database for Horizon 2020 (›EU funding) as at 10 October 2017. Grants for which a signed grant agreement is recorded in the database are included in the data.

The cut-off date for monetary figures relating to ERC funding, as for overall ›EU funding, is 28 February 2017.

In terms of subject classification, the European Research Council (ERC) distinguishes between the three research areas of Social Sciences and Humanities, Physical Sciences and Engineering, and Life Sciences, which are divided into a total of 25 subject panels. For the analyses in the Funding Atlas, the funded projects are fitted into the ›DFG subject classification system at the level of scientific discipline on the basis of the subject panel they are allocated to.

The allocation to research institutions for the institution-specific analyses in the Funding Atlas is based on the host institutions of the principal investigators with whom the grant agreements were in place at the time when the database was generated. Allocation is based on the ›DFG institutions database.

**EU funding**

The evaluations of funding activities in the EU Framework Programme for Research and Innovation – Horizon 2020 were carried out in cooperation with the BMBF’s EU office (project implementer DLR) on the basis of the project database for this Framework Programme (as at 28 February 2017). In the analyses in chapters 3 and 4, funding for German recipients was taken into account. Analogously to ›Federal funding, measures in industry are fully integrated in the analyses and, in this edition of the DFG Funding Atlas, are also included for the first time in the discipline-specific evaluations in chapter 4. The structure of Horizon 2020 can be seen in Table Web-41 at www.dfg.de/fundingatlas.

To depict the funding structures by discipline in chapter 4, the 15 programme areas of pillar II, Industrial Leadership, and pillar III, Societal Challenges, have been allocated on the basis of key topic to the four disciplines defined by the DFG as well as an additional area, “Cross-thematic and cross-sectoral funding areas”. In this edition of the Funding Atlas, for the first time the European Research Council (›ERC funding) and Marie Skłodowska-Curie Actions (MSCA) programme areas are also considered under four separate scientific disciplines. The basis used is the subject orientation of the eight subject panels in the MSCA programme area and the 25 subject panels for ›ERC funding which assess the proposals. MSCA and ERC funding which is not assigned to a specific subject area is classified as “Other”.

The cut-off date for monetary figures relating to ERC funding, as for overall ›EU funding, is 28 February 2017. EU funding recipients were assigned to universities and research institutions in accordance with the ›DFG institutions database.

The analyses presented in chapter 5 consider the international dimension of EU funding. This section shows both the EU member states and countries associated to the Horizon 2020 programme. As at 1 January 2017, these countries are: Albania, Armenia, Bosnia and Herzegovina, Faroe Islands, Georgia, Iceland, Israel, North Macedonia, Moldova, Montenegro, Norway, Serbia, Switzerland, Tunisia, Turkey, Ukraine.
Excellence Initiative

The Funding Atlas 2018 covers the second phase of the Excellence Initiative. Proportion- al funding in the years 2014 to 2016 is considered.

Graduate Schools (GSC) and Clusters of Excellence (EXC) are institutionally allocated to the university as a whole. To allocate the very high award amounts for Graduate Schools and Clusters of Excellence statistically more accurately by institution and subject, an approximation method is used. For each funded group, the principal investigators (PIs) listed in the proposal are recorded. The amount associated with a PI is allocated proportionally to the institution where this person is based. The institute at which the PI is based is classified by subject area (DFG institutions database). This classification is then used to divide the approved amount for a group between subject areas (DFG subject classification system).

In the case of Institutional Strategies (INS), the approved funds are allocated in full to the applicant university at the highest level. They are not proportionally allocated to organisational units such as faculties or departments, nor are awards classified by subject.

Federal funding

In the Funding Atlas, for the analysis of the research funding activities of the federal government, data is taken from the BMBF’s PROFI database (Project Funding Information System), which covers most of the federal government’s direct project funding in the civilian area (see extracts at www.foerderportal.bund.de/foekat). In addition to funding measures of the BMBF, funding programmes of other ministries are also recorded – in particular those of the Federal Ministry for Economic Affairs and Energy (BMWi), the Federal Ministry of Transport and Digital Infrastructure (BMVI), the Federal Ministry of Food and Agriculture (BMEL) and the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB). Funding for military projects is not considered. In this edition, BMWi funding through the Central Innovation Programme for SMEs (ZIM), which is not included in the PROFI database, is fully integrated in the analyses of direct R&D project funding from the federal government as the result of separate data provision by BMWi. In previous editions of the Funding Atlas, part of this programme was reported under AiF funding.

The Funding Atlas only takes account of measures classified as R&D projects which were funded between 2014 and 2016. The provision of financial resources for funding programmes, e.g. of the DFG or for the academy programme, and administrative funds for the bodies responsible for the project or the management of federal government network initiatives is not included. R&D measures at publicly funded institutions and in industry are both taken into account. In this edition, funding for projects in industry is shown for the first time as a separate heading in the discipline-specific analyses in sections 4.3 to 4.6.

In contrast to DFG funding, the amounts approved in these years are not reported; instead, all measures for which funding was awarded in these years are taken into consideration.

The subject allocation of projects is based on the federal government’s R&D planning system. The newly integrated ZIM programme was classified under the relevant funding areas on the basis of the funded technology fields. The reporting logic for key funding areas in direct R&D project funding is shown in Table Web-22 at www.dfg.de/fundingatlas.

Federal funding recipients were assigned to universities and research institutions in accordance with the DFG institutions database.

Non-university research institutions

In this report, institutes and centres of the following research organisations are considered to be non-university research institutions: the Fraunhofer-Gesellschaft (FhG), the Helmholtz Association (HGF), the Leibniz Association (WGL), the Max Planck Society (MPG) and institutions such as hospitals and federal or state institutions with R&D mandates. “Other institutions” also includes the members of the German Federation of Industrial Research Associations (AiF).

The financial and staffing data of non-university institutions refers to the year 2015 and is taken from “Expenditure, Revenues and Staffing of Public and Publicly Funded Institutions for Science, Research and Development”
from the “Finance and Taxes” series published by the Federal Statistical Office (Subject-Matter Series 14, Series 3.6).

The staff figures for non-university research institutions (see Table Web-40 at www.dfg.de/fundingatlas) include within the ‘research staff’ group research and development staff in public-sector research institutions (Table 6.1 of Subject-Matter Series 14, Series 3.6). They do not include technical and other staff. Research staff are listed – differentiated by gender – for the FhG, HGF, WGL, MPG, federal research institutions, state and local research institutions, academic libraries, museums and other publicly funded, not-for-profit organisations, which also includes academies. The figures reflect full-time equivalents, unlike the data for University staff. With effect from 2014, the corresponding staff categories for non-university research institutions are no longer classified in official statistics on the basis of an estimate, but directly recorded, which means comparisons with previous years are only possible to a limited extent.

OECD statistics

The data source for international R&D expenditures is the publication “Main Science and Technology Indicators”, which is published twice a year by the Organisation for Economic Co-operation and Development (OECD). In accordance with the Frascati Manual, R&D activities are surveyed using the same international standard and in different sectors: business (BERD, Business Enterprise Expenditure on R&D), government (GOVERD, Government Intramural Expenditure on R&D), higher education (HERD, Higher Education Expenditure on R&D) and private non-profit organisations (PNP, Private non-profit). For Germany, the expenditures of non-university research institutions are reported in the government sector.

Principal component analysis

Principal component analysis is a method used in multivariate statistics. When there is a large number of statistical variables, the method attempts to identify hidden patterns in the data and reduce the number of variables to a smaller number of components. These components combine groups of variables that correlate to a high degree, separating them from variable groups that correlate to a lesser degree. Component values can then be calculated for the individual cases (in this case universities) on the basis of the identified components rather than the original variables. The resulting reduction in data permits a simpler visualisation of the individual cases (Backhaus et al., 2016: 385ff.).

In the calculation used here, the data for the 40 universities that received the largest amount of DFG funding are entered into the analysis as cases, and the 14 research areas in the DFG subject classification system as variables. The resulting model, with three components, achieves an explained variation of 60.3%. The Kaiser-Meyer-Olkin criterion, a quality criterion for principal component analysis, is 0.65, which corresponds to medium quality (Backhaus et al., 2016: 398). For the individual variables this criterion ranges from 0.20 to 0.83, with the research areas of agriculture, forestry and veterinary medicine, chemistry, mathematics and geosciences lying below the value of 0.5 regarded as decisive in the literature. Following the calculation a varimax rotation was performed to enhance the definition of the identified components. The rotated matrix of variables and components is shown in Table Web-37 at www.dfg.de/fundingatlas.

Regions

The Funding Atlas illustrates in cartographic diagrams the distribution of DFG awards, federal government funding and EU funding in the various regions of Germany. The analytical units are the spatial development regions (RORs) defined by the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR). With a total of 96 such regions, this Funding Atlas examines a large area. Spatial development regions serve as an observation and analysis grid for spatial reporting. With the exception of city states, they represent large, functionally delineated spatial units which are defined by an economic centre and its environs. Spatial development regions also do not cross federal state boundaries, so with the exception of the Bremerhaven region there are no regions that overlap different federal states. The names given to spatial development regions follow the system developed by the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR).
For each entity in the → DFG institutions database, the associated spatial development region is indicated. For example, an institute at a university is shown in the regional view with its own address and not that of the university’s central administration, which may differ.

Third-party funding corrected for subject structure

With regard to the relative consideration of DFG award amounts, the real per-capita awards in relation to the professorial staff are compared with the ‘statistically expected’ volume of third-party funding, corrected for subject structure, according to the institutional average. Third-party funding corrected for subject structure is calculated as follows:

\[
\text{Expected third-party funding} = \sum 14FG = \text{(number of professors at university in research area x average per-capita award for professorial staff in research area)}
\]

Third-party volume corrected for subject and staff size = expected third-party funding volume / subject-classified DFG awards * 100

For each individual university considered, the number of professors in a research area (see Table Web-4 at www.dfg.de/fundingatlas) is therefore multiplied by the national per-capita average for professorial staff (see Table Web-34 at www.dfg.de/fundingatlas) in the same research area to calculate the statistically expected volume of third-party funding in this area. In the second step, these values are added together across all 14 research areas. The relative ratio of third-party funding corrected for subject structure to subject-classified DFG awards per university is then shown in Figure 3-3. DFG funding instruments which are not subject-classified (→ DFG funding) and Institutional Strategies within the → Excellence Initiative are not included in the calculation.

In this calculation, for both staff figures and DFG awards, Kiel University is shown as fully combined with the University Medical Center Schleswig-Holstein (→ DFG institutions database), as in the official statistics the number of professors (→ University staff) at the University Medical Center Schleswig-Holstein is recorded by Kiel University.

University finances

The data on universities’ financial resources relates to the reporting year 2015. In the time series analyses, the trend over a period of ten years (2006 to 2015) is examined. In the university financial statistics, the universities’ total revenues consist of administrative revenues, third-party funding revenues and basic funding. For the calculation on which Figure 2-2 is based, for universities, only part of the revenues are classified as R&D-relevant (→ OECD statistics).

University staff

The data on university staff is provided by the Federal Statistical Office (DESTATIS) and describes the situation as at 1 December 2015. The staff figures used in the Funding Atlas cover full-time academic staff, including professors.

According to the definition used by the Federal Statistical Office, professors are all persons with a grade of C4, C3, C2, W3 or W2, junior professors and full-time visiting professors. As well as professors, full-time academic staff includes three other groups: associate and assistant professors, research assistants and full-time lecturers. It does not, however, include part-time academic staff, which encompasses visiting professors and emeriti, assistant lecturers, honorary professors, private lecturers, non-regular professors, academic assistants, tutors and student assistants.

The staff data used here does not represent full-time equivalents (in contrast to the staff data for → Non-university research institutions), but rather the number of employed persons (head count).

The data provided by the Federal Statistical Office is aggregated at the level of the 14 research areas defined by the DFG (see Table Web-32 at www.dfg.de/fundingatlas). The proportion of staff which cannot be directly allocated to a DFG research area or scientific discipline (for example, central scientific facilities) was added to the staff classified under research areas and scientific disciplines, weighted by the subject distribution of the university. The consideration by scientific discipline, relative to staff size, in chapters 4.3 to 4.6 only looks at universities where 20 or more professors or 100 or more researchers
were employed full-time in the relevant scientific discipline in 2015.

**Word clouds**

In addition to the subject classification of award amounts for DFG funding and the DFG subject classification system based on the project, the DFG institutions database makes it possible to classify award amounts by subject on the basis of the implementing institution (for example, institute, chair or working group). The subject area classification is based on that of the Federal Statistical Office (DESTATIS classification system) (see Table Web-32 at www.dfg.de/fundingatlas).

On the basis of this information, the subject area classification is represented in a very high level of detail – aggregated for the four scientific disciplines defined by the DFG (DFG subject classification system) and weighted by award amount – as a word cloud (using the original German language terminology of the DESTATIS classification system). Firstly, a discipline is selected according to the subject area classification of the projects, and secondly the data is aggregated using the subject area classification of the institution. To enhance the representation, in Figures Web-7, Web-8, Web-9 and Web-10 at www.dfg.de/fundingatlas, the 150 subject areas as defined by DESTATIS with the highest DFG award amounts are listed and the subject areas are in some cases shortened and in a few cases combined.