

REDE SprachGIS – An online tool for mapping and analyzing linguistic data

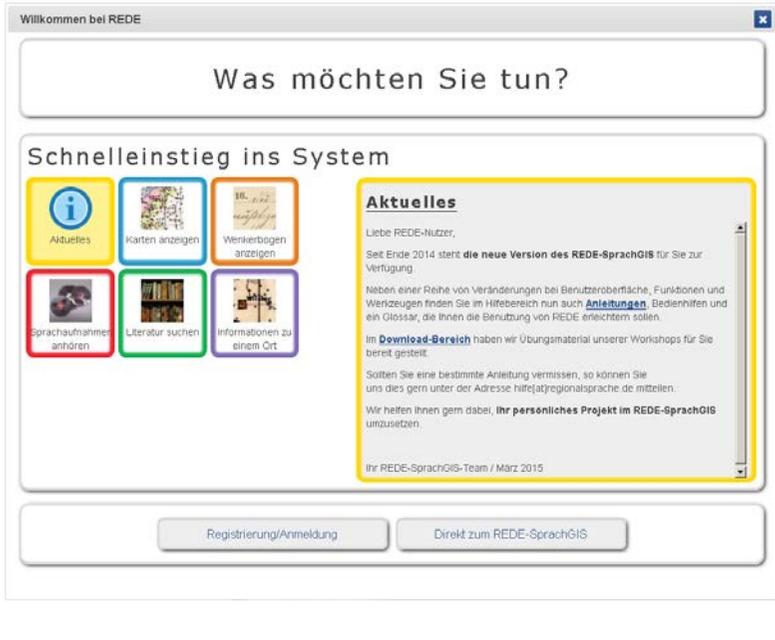
Hanna Fischer (hanna.fischer@uni-marburg.de)

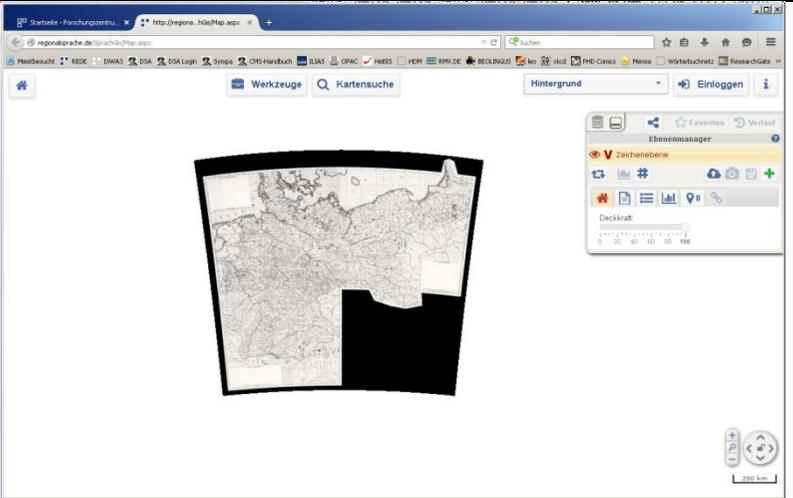
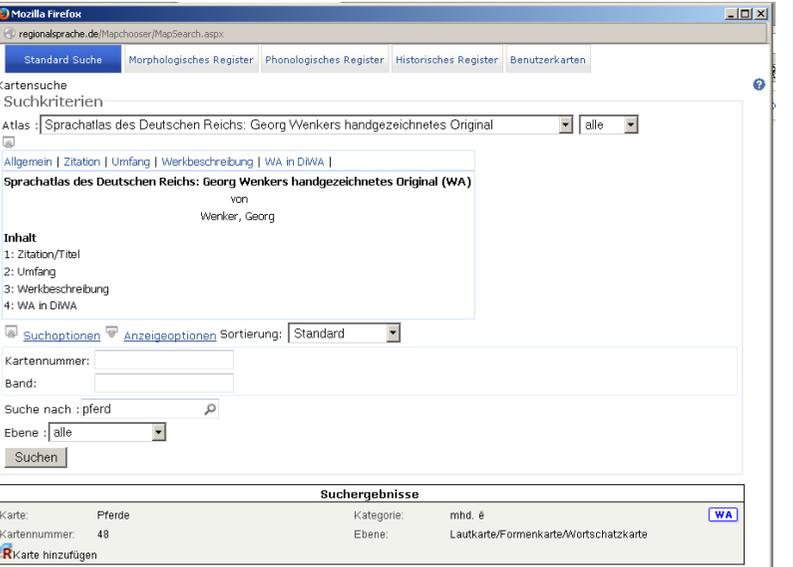
Juliane Limper (juliane.limper@uni-marburg.de)

Philipp Spang (spang@uni-marburg.de)

This handout summarizes the presentations about the REDE SprachGIS at the ICLaVE 8 (International Conference on Language Variation in Europe, Universität Leipzig, 27.5.–29.5.2015) and the Edisyn 8 (Workshop European Dialect Syntax VIII, Universität Zürich, 11.6.-13.06.2015). The talks presented the REDE SprachGIS which is part of the research project Regionalsprache.de.

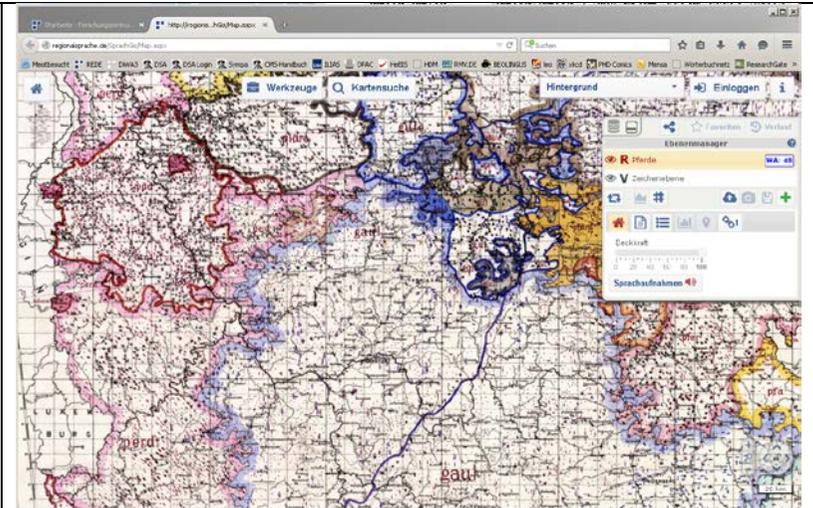
<p>The project <i>Regionalsprache.de</i></p>	<p>What is the REDE project? The REDE project is a long-term project which started in 2008 and ends in 2027. It is funded by the Academy of Sciences and Literature in Mainz. The project leaders are Jürgen Erich Schmidt, Joachim Herrgen and Roland Kehrein. There is one main goal which is the first systematic exploration of the modern regional languages of German. The project's centerpiece is a map-based research platform, the REDE SprachGIS.</p>	
<p>The REDE SprachGIS</p>	<p>This research platform is an online information system for linguistic geography. It is a tool for mapping and analyzing linguistic data. Furthermore, the REDE SprachGIS offers access to</p> <ul style="list-style-type: none"> • digitized language atlases • the questionnaires from Georg Wenker's survey on German dialects in the late 19th century • several sound corpora • databases on regional atlas projects 	
<p>Digitized language atlases</p>	<p>The system offers more than 25 atlases, including Georg Wenker's „Sprachatlas des Deutschen Reichs“. This atlas is available in the SprachGIS as „Digitaler Wenker Atlas (DiWA)“.</p> <p>All in all the atlases in the REDE system contain more than 9000 maps and this inventory of maps is being expanded continuously.</p>	<p>Some of the most important atlases offered by REDE are the</p> <ul style="list-style-type: none"> • Mittelrheinischer Sprachatlas • The Schlesischer Sprachatlas • The Bayerischer Sprachatlas with all its subprojects <p>and the Sprachatlas der deutschen Schweiz</p>

<p>Accessing the SprachGIS</p>	<p>To access the atlases, you must go to the project's homepage at www.regionalsprache.de. The homepage offers various information about the REDE project, its contents and support for working with the SprachGIS. The SprachGIS itself is opened by a click on the right field saying "SprachGIS".</p>	
<p>Shortcuts into the system</p>	<p>After clicking that button, you reach a page with shortcuts for a quick access to the different data categories in REDE.</p> <p>These data categories are "Karte anzeigen" (viewing maps), „Wenkerbogen" (viewing Wenker surveys), "Sprachaufnahmen anhören" (listening to audio) and "Literatur suchen" (literature database) and with a click on "Weiter" they offer specific tools and tutorials to work with the data categories.</p> <p>To go directly to the map viewer click on "Direkt zum REDE SprachGIS".</p>	

<p>The map viewer</p>	<p>The map viewer's structure is structured as follows:</p> <p>In the background you can see Wenker's base map, which is set as the default map.</p> <p>On the right hand side, you can find the Ebenenmanager. Here all active layers and maps are managed.</p> <p>You can search through the map database using the "Kartensuche" and load any map you choose into the map viewer.</p> <p>The button Werkzeuge offers all the tools you need for generating and editing maps as well as a tool for searching through the categories that were already mentioned.</p>	
<p>Searching and viewing maps</p>	<p>You can search for all maps in all atlases which are included in the system via the "Kartensuche". An important part are the maps from Georg Wenker's "Sprachatlas des Deutschen Reichs". All of these hand-drawn maps were digitized and are now available as raster-maps. For example, you can search for the word "Pferd" ('horse') in this atlas.</p> <p>To do so, we open the Kartensuche and first choose the correct atlas. Then we type in the search term "Pferd". With a click on "Karte hinzufügen", the map is added to the map viewer and activated in the "Ebenenmanager".</p>	

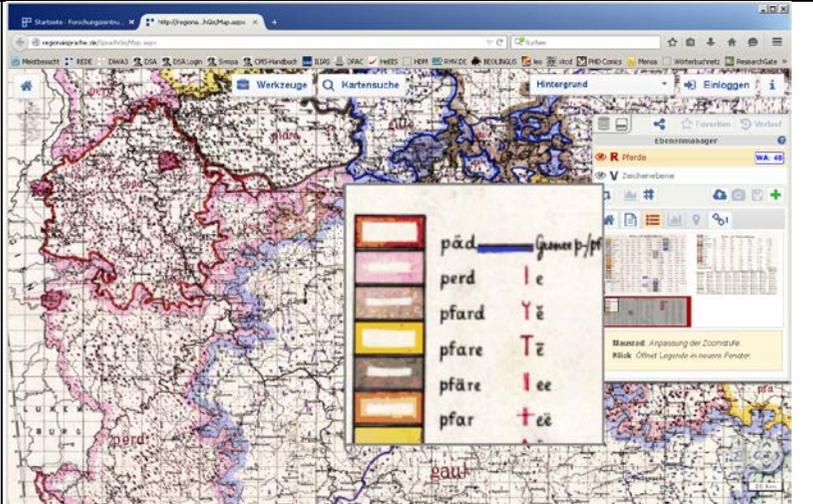
Wenker's maps

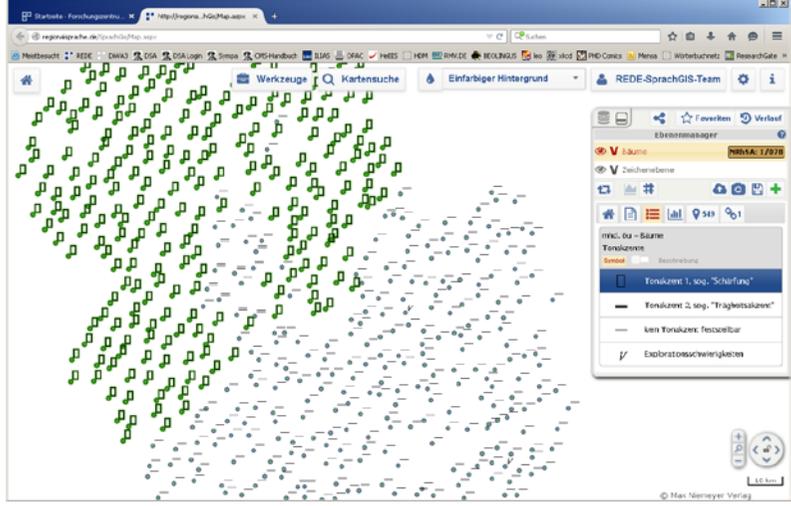
You can now zoom in and have a look at the distribution of the different variants used for the word "Pferd" in the questionnaires.



Map legends

Via the Ebenenmanager you can also retrieve the map legend for further information about the symbols used. You can look at it right in the map viewer or open it in a new tab by clicking on the legends.



<p>Regional atlases</p>	<p>Of course you can also add maps from regional atlases to the map viewer this way. For instance, let's have a look at the "Mittelrheinischer Sprachatlas", the language atlas for the Central-Rhineland.</p> <p>For this atlas the maps are available as scanned originals and thus as raster-maps but they are also included in a database and thus available as vector maps. With vector-maps the user can work with the data directly in the SprachGIS. Let's take a quick look at the map for the word "Bäume" ('trees').</p>	
<p>Vector maps</p>	<p>So you open the "Kartensuche" again and choose the atlas "Mittelrheinischer Sprachatlas". The map for the word "Bäume" is the first hit. You add it to the map viewer where it is activated. Then you zoom in closely to have a better look at the distribution of the variants.</p> <p>When you move the mouse over the symbols in the legend, the locations are highlighted at which the symbolized variant is spoken.</p>	 <p>The screenshot shows a web browser window displaying the SprachGIS application. The main map area shows a distribution of green tree symbols (representing the word 'Bäume') across a geographical region. The interface includes a search bar at the top, a legend on the right side, and a toolbar at the bottom. The legend shows a list of variants with corresponding symbols and a description of the symbolization.</p>

<p>Distribution of variants</p>	<p>The SprachGIS also offers a look at the frequency distribution of the symbols used.</p>	 <p>The screenshot shows a software interface titled 'Ebenenmanager'. It features a layer list with 'Bäume' (Trees) and 'Zeichenebene' (Drawing level). Below the list is a toolbar with icons for home, layers, settings, a bar chart, location (549), and search (1). The bar chart displays two bars: the first bar is at approximately 250 on the y-axis, and the second bar is at approximately 280. The y-axis ranges from 0 to 300 in increments of 50. The x-axis has four categories, with the first and third categories having significant values.</p>
<p>Wenker's questionnaires, sound corpora, bibliography</p>	<p>Just a few facts and figures about the questionnaires from the Wenker survey, sound corpora and the bibliography: The system contains more than 55,000 digitized questionnaires from Wenker's survey as well as several sound corpora with more than 5,000 recordings. If you are looking for literature dealing with regional languages, the system offers the database GOBA, which includes more than 25,000 titles.</p> <p>Of course, the inventory of sound recordings and the literature database are being expanded continuously just like the map inventory.</p>	

<p>Research tool</p>	<p>The research tool offers access to all these categories. It can be found in “Werkzeuge”.</p> <p>The research tool offers a general search in the three categories as well as a specific search with different filters for each category.</p> <p>If you would like to have an overview of what data the system offers for a specific place, you just type in the place name – in our example: “Marburg” – in the research tool and click on “Suchen”.</p>	
----------------------	---	---

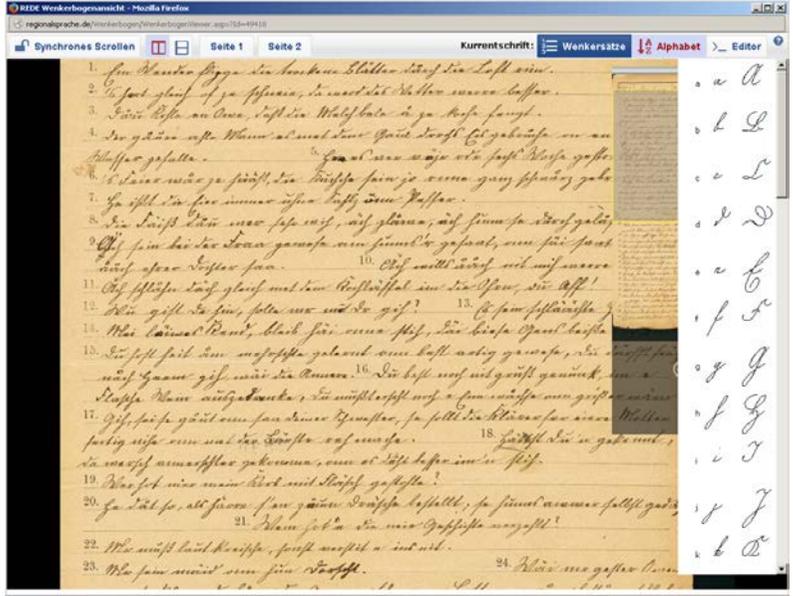
Wenker questionnaires

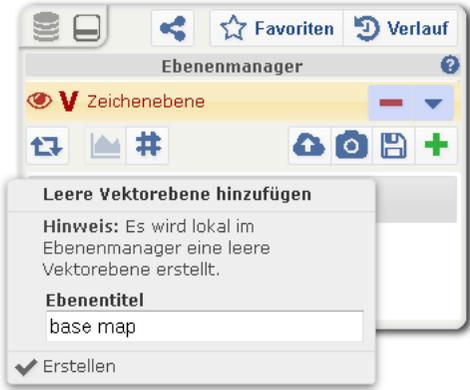
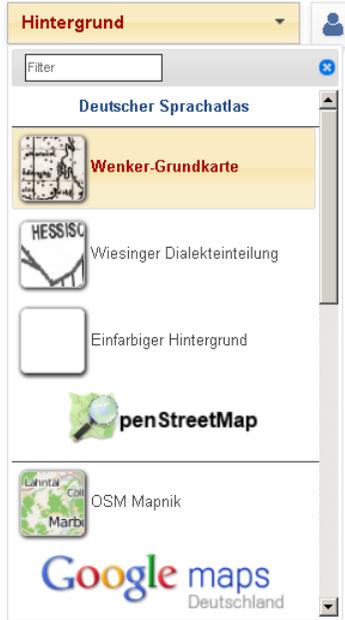
The search for “Marburg” offers results in four categories: 6 locations, 19 bibliographic references, 3 sound recordings and 4 questionnaires. Let’s briefly take a more detailed look at the questionnaires.

Why is this important or even interesting? Most of the words which were collected in the questionnaires were also mapped. But a more accurate examination of a single questionnaire for one location offers the opportunity to explore other phenomena which have not yet been mapped.

First, by using the target icon we can have a look at where “Marburg” is located. With a click on the arrow, other options are opened: the questionnaire can either be downloaded directly or displayed in a separate tab or window.



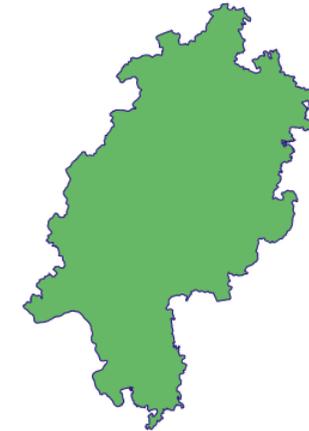
<p>Viewing the questionnaires</p>	<p>Here you can zoom in very closely. This facilitates the reading of the so called “Kurrentschrift”, which is an old form of cursive handwriting that was used in Germany in the 19th century. The viewer tool also offers support for reading this handwriting.</p> <p>You can also have a look at the back page of the questionnaires with additional information about the teacher who filled in the questionnaire and some specifics about the local dialect.</p>	
<p>Making your own maps</p>	<p>In addition to the just presented contents the SprachGIS offers the opportunity to make your own maps and analyze your own data. The maps generated can be saved online and exported as high-definition pictures, for example for publications.</p>	
<p>Making base maps – Create a new layer</p>	<p>To create your own map using the SprachGIS, you first need a new layer that you can visualize the given information in. In most cases it is advisable to compose a map of multiple layers so that different kinds of information can be modified independently. For example, one layer might contain political information, while a second layer contains the linguistic information.</p>	

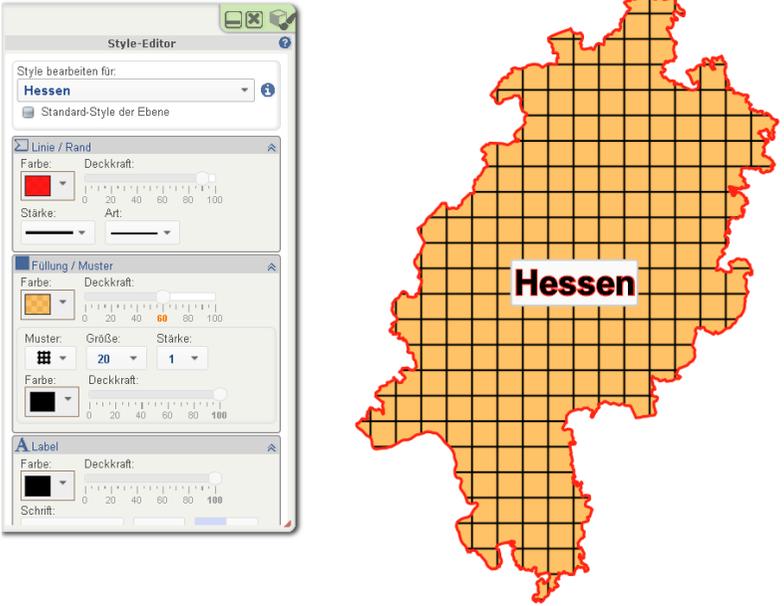
	<p>To create a new layer a layer you can click on the green plus sign in the Ebenenmanager and type in the name of the new layer.</p>	
<p>Making base maps – Design the map background</p>	<p>In the next step we will describe how you can change the design of the background. In the SprachGIS you can choose from a set of linguistic, political or topological maps, or you can set a monochrome background as well. The selected background is not part of a layer and can thus be changed independently from the active layers. For example, you could design a map in front of an Open Street Maps background and change to a blank background later. To choose the background in the SprachGIS you click on the background menu. There you will find the selection of background maps.</p>	

Making base maps – Add elements to the layer

Next, you can choose a set of elements that will provide spatial orientation on our map. The SprachGIS features a range of elements, for example political units (such as nations or counties) or geographic landmarks like rivers and lakes. To add elements to your map you can use the tool “Kartenelemente hinzufügen” in “Werkzeuge”.

In our example the area under investigation is the German Bundesland of Hesse. So, we use the filter options and filter by “Bundesländer”. Then we load the Bundesland of Hesse into our layer.



<p>Making base maps – Modify the layer’s appearance</p>	<p>The look of every element can be modified to either clarify its function or suit your aesthetic preferences – or perhaps both. You can choose for example the fill colour or the margin style or decide what should be displayed as the label of an element.</p> <p>You can modify the style of an element with the style editor tool (in “Werkzeuge”). There you can choose from a wide selection of styles.</p>	
<p>Making linguistic maps</p>	<p>Having designed a base map we can now go on to add a new layer with linguistic information.</p> <p>You can make your own linguistic maps by importing space-related data sets. The data can be visualized for example as a pie chart map, a bar chart map or as a map with symbols or phonetic transcriptions.</p>	

Making linguistic maps – Example: Making a pie chart map

As an example we have taken data from the phd-project by Hanna Fischer which is about the „Preterite loss in the varieties of German“. The data was collected by the SyHD project. The Project „SyHD – Syntax Hessischer Dialekte“ is a DFG funded project which explores the syntactic structures of the Hessian dialects. (For further information see www.syhd.info.) In one part of the project, data has been collected by written questionnaires. One kind of task in the written questionnaires included translation tasks in which the informants should translate a standard sentence into their local dialect.

Task: translation into the dialect
Ja, der kam aber erst zum Kaffeetrinken.
 YES HE CAME BUT NOT UNTIL TO DRINKING COFFEE
 ‘Yes, but he didn’t come until coffee was served.’

Our target variants were the preterite and present perfect forms: “kam” and “ist gekommen”

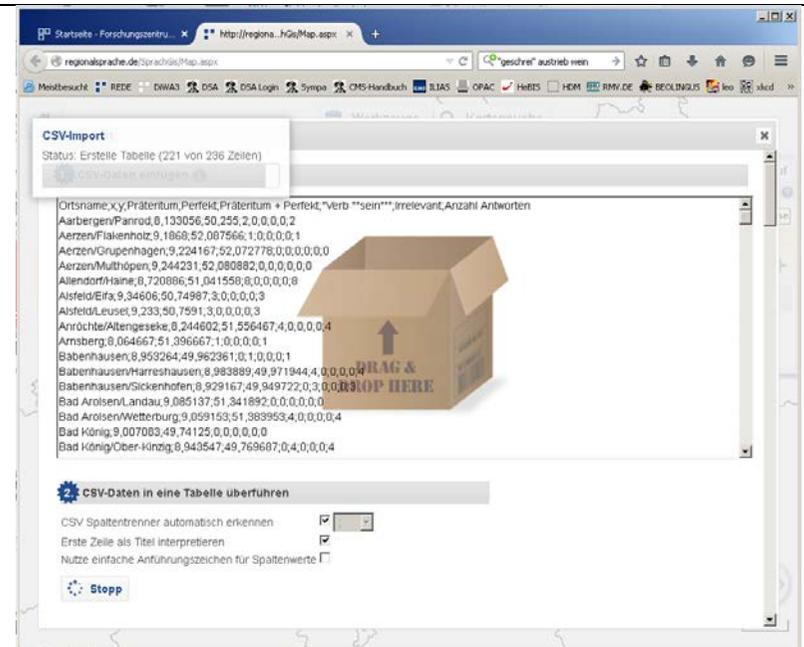
Making linguistic maps – Data set

To be able to map the results of this survey we need to enter the linguistic data into a data base. This has already been done by the SyHD-project. The answers in the questionnaires were entered into a table which assigns the number of answers per variant to the name of the location and their geographic coordinates. In the table you see that every row corresponds to a location and every column to a variant: blue stands for preterite, red for present perfect and so on. The table can be imported into our system as soon as it is saved in csv-format.

1	A	B	C	D	E	F	G	H	I	J
Ortsname	x	y		preterite	perfect	preterite + perfect verb "sein"	irrelevant		number of answers	
2 Aarbergen/Panrod	8.133056	50.255		2	0	0	0	0	2	
3 Aezren/Flakenholz	9.1868	52.087566		1	0	0	0	0	1	
4 Aezren/Gruppenhagen	9.224167	52.072778		0	0	0	0	0	0	
5 Aezren/Multhöfen	9.244231	52.080882		0	0	0	0	0	0	
6 Allendorf/Haine	8.720886	51.041558		8	0	0	0	0	8	
7 Aisfeld/Eifa	9.34606	50.74987		3	0	0	0	0	3	
8 Aisfeld/Leusel	9.233	50.7591		3	0	0	0	0	3	
9 Anröchte/Altengesek	8.244602	51.556467		4	0	0	0	0	4	
10 Arnöberg	8.064667	51.396667		1	0	0	0	0	1	
11 Babenhausen	8.953264	49.962361		0	1	0	0	0	1	
12 Babenhausen/Harreshausen	8.983889	49.971944		4	0	0	0	0	4	
13 Babenhausen/Sickenhofen	8.929167	49.949722		0	3	0	0	0	3	
14 Bad Arolsen/Landau	9.085137	51.3481892		0	0	0	0	0	0	
15 Bad Arolsen/Wetterburg	9.059153	51.383953		4	0	0	0	0	4	
16 Bad König	9.007083	49.74125		0	0	0	0	0	0	
17 Bad König/Ober-Kinzig	8.943547	49.769687		0	4	0	0	0	4	
18 Bad König/Zell	8.992465	49.720914		0	4	0	0	0	4	
19 Bad Soden-Salmünster/Ahl	9.396389	50.293611		2	1	0	1	0	4	
20 Bad Soden-Allendorf/Oferröde	9.939444	51.257222		2	2	0	0	0	4	
21 Bad Wildungen/Odershausen	9.107222	51.087778		4	0	0	0	0	4	
22 Battenberg (Eder)/Dodenau	8.596111	51.025556		7	0	0	0	0	7	
23 Baunatal/Kirchbauna	9.422194	51.245353		7	0	0	0	0	7	
24 Bebra/Solz	9.800278	51.004444		2	1	0	0	0	3	
25 Beerfelden/Hietzbach	8.9891	49.5973		1	4	0	0	0	5	
26 Bensheim	8.622778	49.681111		0	1	0	0	0	1	

Making linguistic maps –
Importing your data

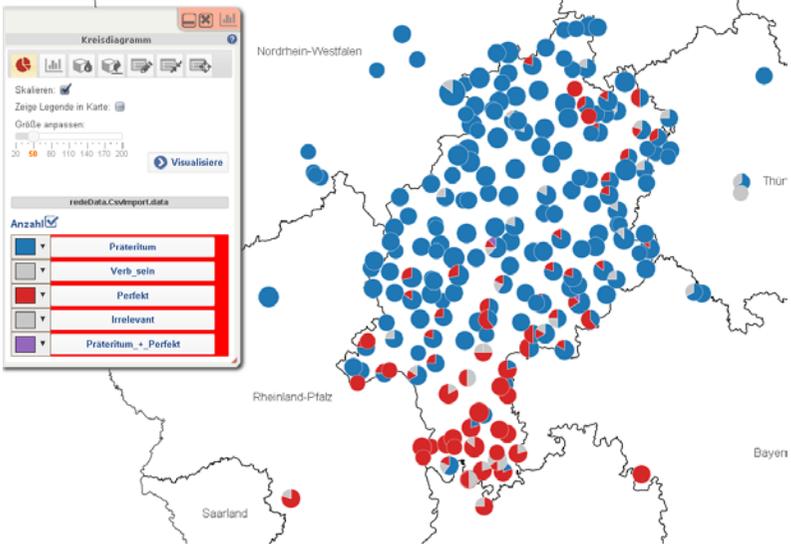
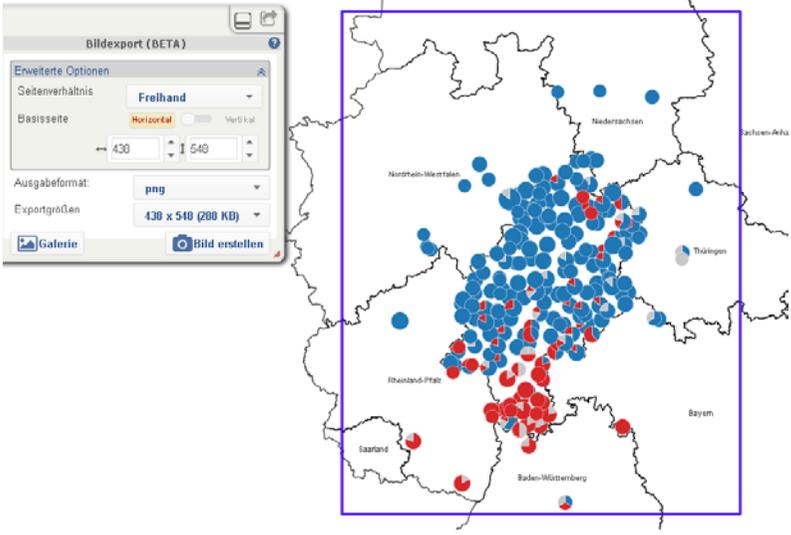
The data can be imported by the import tool. To open this tool you click on the little cloud icon. In the import tool we upload the csv-file per drag and drop. And then your data is being uploaded. Afterwards, you can see your data in the lower part of the import tool. It is presented as a table.

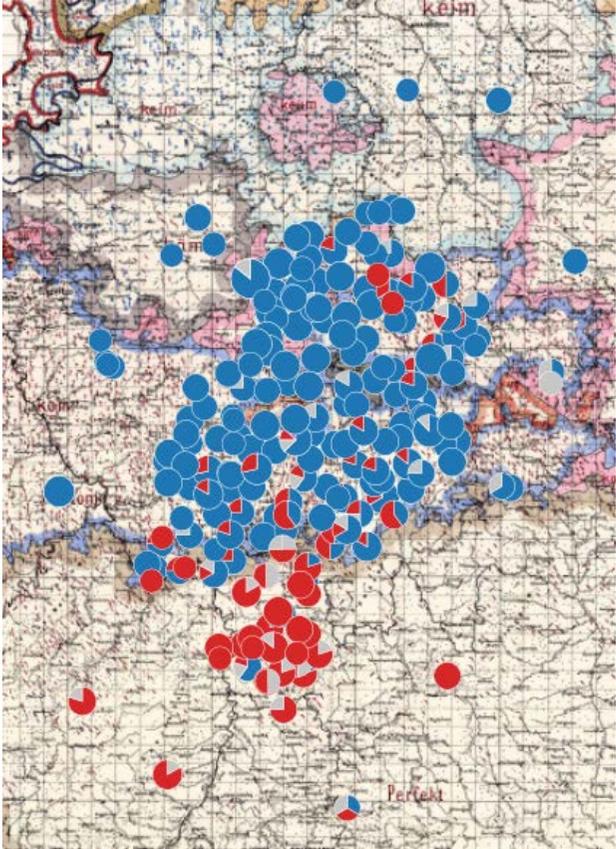


Making linguistic maps –
Matching your locations to
the locations in REDE
SprachGIS

Next, you can use the matching function to match the geographic coordinates in our data set to the locations in the system. Therefore, you click on the matching function in the import tool and then everything gets matched up. As soon as everything has been matched up we can check our data set and select which columns should be mapped out. So, you can still work on your data when it is online. With a click on the import button you initiate the mapping.



<p>Making linguistic maps – Visualizing the geographic distribution</p>	<p>Now the data has been mapped out in the system, but we still cannot see which linguistics variants appear where. What we need to do is attribute different colours and shapes to our variants so that we can better visualize their distribution in space.</p> <p>Therefore you open the statistics tool. Then, like you see in the demonstration, you can choose the layout of our visualization. So again, we choose the colour blue for preterite, red for present perfect and so on. Then you can click on „Visualisiere“ and: That’s it – the map is finished.</p>	
<p>Making linguistic maps – Exporting your maps</p>	<p>Of course, you can export your map as a picture file. Therefore, you need to click on the little camera icon which opens the export tool and a blue frame. The frame helps you choose the cutout that you want to export.</p> <p>In the export tool you can select from a range of different file formats and picture definitions. The pictures can be saved in your picture gallery online. And of course, with a click on that button you can download them.</p> <p>In addition, you can export the data behind a particular map as a csv-file.</p>	

<p>Making linguistic maps – Comparing your maps with Wenker’s maps (DiWA)</p>	<p>You can also use the atlases and other contents in the REDE SprachGIS for further analyses. For a further analysis of the shown data you can load the Wenker map for the preterite form of „to come“ into the Ebenenmanager using the “Kartensuche”. Next you can move the Wenker map layer to the bottom of the layer pile so that you can see the data on top of the Wenker map.</p> <p>This allows a 120 year comparison of the preterite loss in the Hessian dialects. As we see, the variation has increased – especially above the preterite/perfect isogloss – but we can still see the general division of the German language area. In the northern dialects the preterite is quite robust while it is reduced in the southern dialects.</p>	
<p>Your project in REDE SprachGIS</p>	<p>The REDE SprachGIS is open for your own maps and even for a whole linguistic atlas. We would like to help you to realize your own project in the REDE SprachGIS.</p> <p>Please contact us via e-mail (kontakt@regionalsprache.de) for any assistance or consulting.</p>	