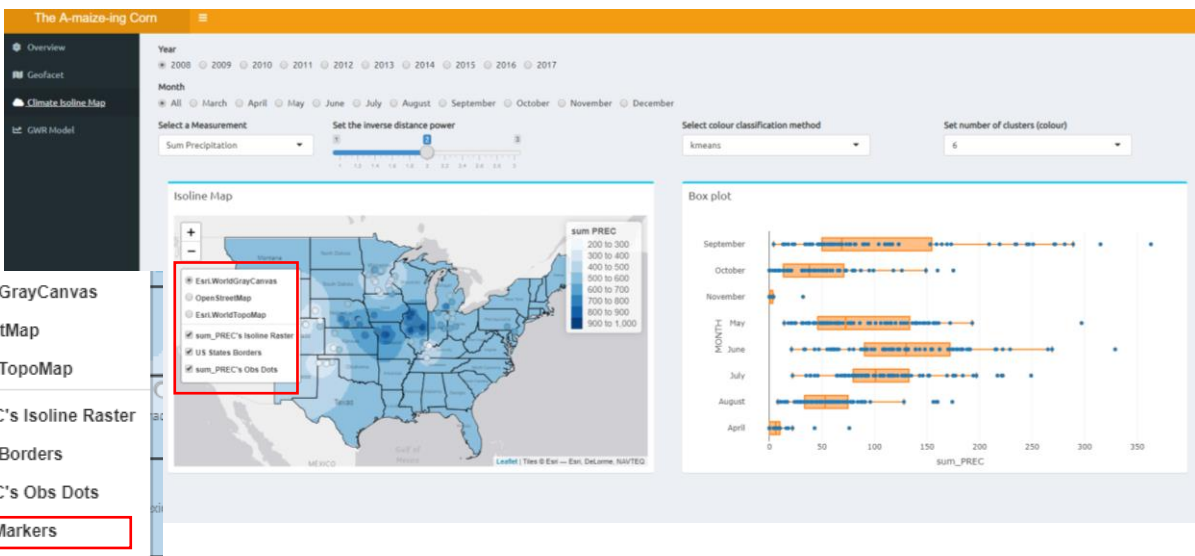


User Guide for the A-maize-ing Corn Dashboard

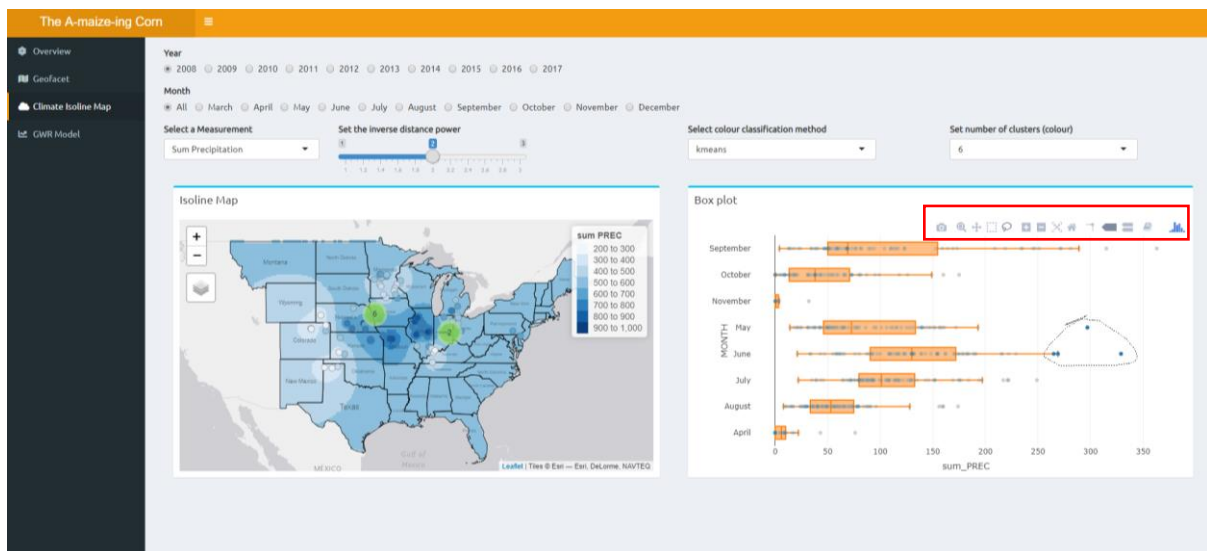
Isoline View Control



By default, tmap provides various map background, starting from the plain cartograph until the coloured map with traffics shown. To enhance user exploratory experience, the graph layers are named so that user can easily uncheck and remove them to focus their analysis one of the layer.

An extra layer called Highlight Markers are drawn if user made selections to the boxplot. This layer contain icons for the highlighted region.

Isoline selection



To support data exploration activity, our app supports interactivity by allowing user to select any observations in the boxplot and observe the corresponding environment location within the isoline map.



Selecting Points - Red

To select the observation, user can choose either to click the observation to observe a single point, or to select a number of observations at one goal. To select multiple number of observations, user is

allowed to choose the two tools highlighted in red. While the left tool will allow user to do a square selection and the right tool will provide user a free-style selection with lasso.

Zooming in and out of boxplot - Blue

To make controls easier, users are allowed to zoom in and out to have more granular selections. After tempering with the boxplot view, user can reset back to the original view by clicking the home button. The controls for this activity are highlighted in blue.

Graph Inferring Aids - Green

To allow better readability, user can activate line-aids that will help in making inference to the x and y axis of the graph. Furthermore, comparing multiple observation points are also enabled by toggling between the two right-most features within the green box.

Resetting Selection

To reset and remove selected markers from the map, user can double click at any blank spaces available within the boxplot.

GWR Calibration Steps

Step 1

The screenshot shows the 'The A-maize-ing Corn' application interface. At the top, a navigation bar indicates four steps: 1. Model Input Data, 2. Variable Transformation, 3. Variable Selection, and 4. GWR Model Calibration. The main area is titled 'Data View' and 'Data Description'. Under 'Data Description', there is a table with columns for Variable Name and Description. Below this, there are controls for 'Select Aggregation Mode' (Sum, Mean, Median, Min, Max, StdDev) and 'Select Observation Year' (2008). A 'Next Step' button is highlighted in green. A separate window titled 'Data Dictionary' is shown above, listing variables and their descriptions.

Variable Name	Description
1 ENV_ID	Identifier for the tested location and year
2 YIELD	Yield of the tested hybrid in tested location (quintals/hectare)
3 YEAR	Year grown
4 LAT	Latitude of location rounded to nearest 0.1 degree
5 LONG	Longitude of location rounded to nearest 0.1 degree
6 ELEV	Elevation of field
7 CLAY	% of clay in soil
8 SILT	% of silt in soil
9 SAND	% of sand in soil
10 AWC	Available water capacity in soil

Upon clicking the GWR model tab, user will arrive at the first step of the GWR model construction and calibration section. On this page, user is allowed to change the aggregation mode for the target variable and the observation year. If user need clarification for the different variables used, user will have data dictionary provided on the separate tab sheet shown with blue marks above.

User can proceed to step 2 by clicking the button highlighted in green.

Step 2

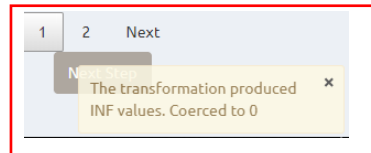
The screenshot shows the 'The A-maize-ing Corn' application interface at Step 2: Variable Transformation. The main area has a 'Select Var to Transform' dropdown set to 'MeanYIELD' and a 'Select Transform Mode' dropdown set to 'None'. A 'Transform' button is visible. Below this is a table with columns for Variable List, Transform Status, and Actions. The 'ELEV' variable is highlighted, and its 'Plot Histogram' button is highlighted in red. A 'Variable Histogram' window is open, showing a histogram for the ELEV variable. A 'Next Step' button is highlighted in green.

Variable List	Transform Status	Actions
1 MeanYIELD	None	Plot Histogram
2 ELEV	None	Plot Histogram
3 SAND	None	Plot Histogram
4 AWC	None	Plot Histogram
5 CLAY	None	Plot Histogram
6 SILT	None	Plot Histogram
7 PH	None	Plot Histogram
8 OM	None	Plot Histogram
9 CEC	None	Plot Histogram
10 KSAT	None	Plot Histogram

Using the data carried forward from the previous step, on this step user can check the distribution of each variables.

The controls highlighted in blue will allow user to perform transformation to skewed variable distribution. User can recheck the transformation result by re-plotting the histogram. If result is not as wished, user can revert the data back to its original form by selecting NONE in Transform Mode and click Transform button

Please pay attention to signs in bottom-right corner of the apps to look whether the transformation is success. On the case where the transformation produces INF values, the application will automatically impute the value with 0 to avoid error in the Step 4.



Click next button (highlighted in green) to proceed to the next step.

Step 3

On this step, user is allowed to select the variables that are going to be used in the modelling stage. User can interactively Include / Exclude the variables by clicking the buttons corresponding to each variable. Take note that the target variable 'YIELD' cannot be excluded and will always reside within the selected variable list.

Click next button (highlighted in green) to proceed to the last step

Step 4

Upon arriving at this stage, user can immediately run the model to go with the default calibration setting of GWR. The model will run on data carried forward from the previous steps with variables selected in the step 3. User will have two main isoline maps displayed for each of independent variables, which visualise the local coefficient and statistical significance of it. User will only have one map displayed if 'YIELD' is chosen.

If particular adjustments to the model calibration are needed, user can calibrate the model with their own setting, e.g. manual input of bandwidth.

The two tabs highlighted in green are to view the output table of the GWR model and show the result of the least square regression model additionally performed on the dataset.

The screenshot shows the 'The A-maize-ing Corn' web application. The interface is divided into a sidebar on the left with navigation options like 'Overview', 'GeoFacet', 'Climate Isoline Map', and 'GWR Model'. The main content area has a top navigation bar with steps: '1. Model Input Data', '2. Variable Transformation', '3. Variable Selection', and '4. GWR Model Calibration'. Below this, there are controls for 'Insert your bandwidth' (set to 'auto bandwidth'), 'Select Your Kernel' (set to 'Gaussian'), and an 'adaptive kernel' toggle. A 'Run Model' button is present. Below these controls are three tabs: 'Map Result', 'Data Output', and 'Global Regression'. The 'Data Output' tab is active, showing a 'GWR Result Table'. At the top left of this table is a 'Save Result' button, which is highlighted with a red rectangle. The table has 14 columns: ENV_ID, YEAR, LONG, LAT, MeanYIELD, SILT, PH, OM, CEC, KSAT, yhat, Intercept, Intercept_TV, SILT_Coeff, and SILT_TV. It displays 10 rows of data for different environment IDs (Env_1000 to Env_1094) from the year 2008. At the bottom of the table, it says 'Showing 1 to 10 of 69 entries' and includes a pagination control with 'Previous', '1', '2', '3', '4', '5', '6', '7', and 'Next' buttons.

ENV_ID	YEAR	LONG	LAT	MeanYIELD	SILT	PH	OM	CEC	KSAT	yhat	Intercept	Intercept_TV	SILT_Coeff	SILT_TV
1 Env_1000	2008	-100.6	39.4	121.802436666667	42.8	7	2.4	20.3	4.6	130.282277359431	90.6572422296031	1.6950415635244	-0.47336849002292	-1.34719392739179
2 Env_101	2008	-92.3	45	98.9558376089744	51	5.8	6.5	22.3	1.8	106.141276568267	46.8201800216411	0.873760019045691	0.2396495931572	0.651435230025085
3 Env_1019	2008	-98.5	40.5	124.113640169395	56.2	6.3	3.4	24.3	1.7	121.358856795755	88.1085776174074	1.62868025978329	-0.400546366102626	-1.11043002460809
4 Env_1027	2008	-97.4	40.9	110.589771872466	59.3	6.1	3.5	27	1.1	119.61838505943	80.9168068052779	1.52095284143578	-0.29750953010643	-0.841975313371787
5 Env_1035	2008	-97.2	40.8	94.109806	53.3	6.2	3	25.5	1.3	123.657912539997	79.7449889474753	1.50135536417523	-0.279952748905592	-0.795610360734493
6 Env_1052	2008	-94.7	39.7	140.32755443195	63.2	6.2	3.6	25.5	0.9	121.999294144997	67.1699436996556	1.27754694000766	-0.0304685618136035	-0.08761417707057
7 Env_1061	2008	-95.1	41.3	140.848012756417	60.3	6.2	4.1	28.5	0.8	122.166209806915	67.076307555865	1.25177073043585	-0.0097810643791406	-0.0264437862992612
8 Env_1082	2008	-90	39.7	131.787672966959	64.3	6	4.4	27.3	0.7	123.534740542116	63.6841880923788	1.09607567914181	0.471595485846716	1.139880901177607
9 Env_1090	2008	-88.4	39.5	123.038430409929	58.2	6.1	4.1	24.3	1.1	119.164873314002	85.165335821753	1.23041872348583	0.585363181214362	1.24358043984022
10 Env_1094	2008	-88.2	38.4	122.321916842339	60.2	6.2	4.5	20.7	1.3	116.072859091653	89.5468377174746	1.27336559507317	0.573023095097557	1.21867235623548

Within the output dataset tab, user is also allowed to download the output table by clicking the save result button on top of the table.