



City Flow – Virtual Current Experiment

(Resource ID: 206)

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This teaching resource is allocated to following University:

BOKU - University of Natural Resources and Life Sciences Vienna

Institution:

Institute of Meteorology (BOKU Vienna)

<http://www.sustainicum.at/en/modules/view/206.City-Flow-Virtual-Current-Experiment>



Individual work
Plenum



Independent of
the number of
students



Up to 3 lecture
units



English, German

City Flow is software that allows the user to create a virtual environment within an editor program to create a roughly realistic 3-D model of air current conditions in relation to the model's structures.

Andreas Mursch-Radlgruber created the software in Java as part of a final project.

The 3-D model of air current structures is possible by using the diagnostic solution of the law of conservation of mass, using current-dynamic background knowledge based on empirical relations of topological structures (buildings, trees etc.). The numerical solution is solved using 3-dimensional relaxation.

The editor program allows a realistic approximation of playfully complex scenarios. The results are calculated within seconds (depending on the computer's capacity) and displayed in easily understandable 3-dimensional form on the screen. The illustrations are stationary fields, which can easily be rotated and zoomed. A visualization of the trajectory allows the current structures to be more precisely studied.

Aha effect

The interactive nature of the program makes it possible to study and understand the complex effect of built structures on air currents (e.g. recirculation, quicker cutting of paths, etc.).

Teaching Tools & Methods



Simulation program



Reflection

Contact details for borrowing physical devices

Email to author

Learning Outcomes

Understanding the effect of air current barriers on the Earth's surface.

Relevance for Sustainability

Air currents are a very significant element in our physical environment. All activities in our environment change (sometimes more, sometimes less) current conditions and their subsequent effects (transportation). This simulation tool can quickly portray the effect of structural changes on currents.

Related Teaching Resources

No specific previous knowledge / related resources required

Teaching Methods

 [Methods for a qualitative spatial analysis](#)

Preparation Efforts

Low

Access

Free

Sources and Links

Oke, T.R.: 2001: Boundary Layer Climates. 2ed, Cambridge Univ. Pr.

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