



Bringing quality
to the
built environment

Daysim Daylighting Design Tool

Objectives

To develop an advanced daylighting design tool to predict daylight availability and electric lighting use in buildings.

Background

The potential to use daylight to offset electric lighting is related to the amount of daylight in the building's interior and the type of lighting controls used. Daylight availability is a function of building envelope and roof design and workstation layout, and lighting energy savings depend on the control systems in place and how occupants use them. A new tool developed by the National Research Council now allows designers, architects and commercial builders to address more model daylight availability dynamically, and to get a more realistic estimate of energy savings for the building in use.

Statement of Work

The following are the tasks in this project:

- Develop and validate a dynamic, Radiance-based simulation module to simulate annual illumination profiles
- Develop a module to calculate short-time step dynamics of direct and diffuse irradiances from hourly means
- Develop a stochastic user occupancy model from field data on manual lighting and shading control
- Develop a graphical user interface for the program

Outcomes

- Enhanced Daysim daylighting design tool
- LIGHTSWITCH 2002 – a model for manual control of electric lights and blinds
- Research papers and reports

Partner

Fraunhofer Institute for Solar Energy Systems (www.ise.fhg.de)

Start/Completion Dates

The project began in August 1998 and is ongoing.

Project Manager

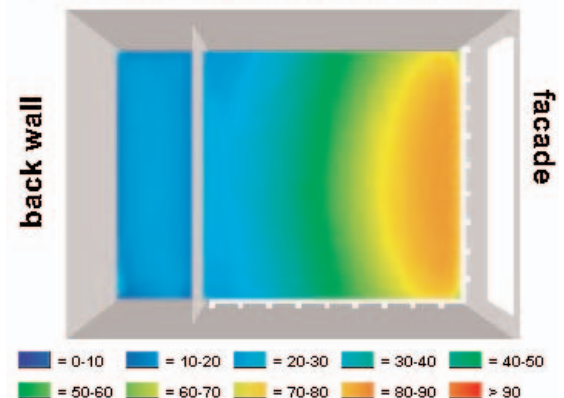
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For more information, see: http://irc.nrc-cnrc.gc.ca/ie/lighting/daylight/daysim_e.html

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Daylight Autonomy Distribution [%]

OTTAWA_NRC, min. illuminance classroom: 300lux, or. South
min. illuminance aisle: 50lux, active blind control, axis unit = 3ft



Example Lightswitch Wizard output – daylight autonomy distribution for a classroom facing south located in Ottawa, Canada