BioSIM is a software tool designed to assist in the application of temperature-driven simulation models in pest management. It can also be used as a tool in the development and analysis of such models for purposes of scientific investigation.

BioSIM’s main purpose is to generate forecasts of features or “events” in the seasonal biology of pests or their host plants. Forecasts are made by simulation models provided by the system and are governed by weather conditions (temperature, precipitation, humidity, wind, pressure, snow, and solar radiation) interpolated from nearby weather stations, adjusted for elevation and location differentials with regional gradients. What distinguishes BioSIM from other software is its ability to combine actual daily/hourly weather records (including short-term forecasts) and disaggregated randomized normals in a single operation.

BioSIM provides extensive analysis functions to summarize model output and present it in the form of tables or maps. With a digital elevation map (DEM), BioSIM can perform spatial interpolations and generate output maps (surfaces) using a choice of techniques such as spatial regression, kriging or thin-plate splines. Such a map can then be used by itself or in conjunction with other geographically referenced information in the development of ecological insight or of pest management plans.

BioSIM is of interest to any organization responsible for monitoring or managing insect pest populations in outdoor situations (forestry, agriculture, horticulture). BioSIM can be used to plan the timely deployment of sampling or surveying crews and materials (e.g. pheromone traps) without the need for extensive phenology monitoring. Also, it can help time the application of pest control substances for optimal results. Thus, using BioSIM can help optimize the use of pest management resources in a cost-effective manner.

You can download BioSIM from site: https://apps-scf-cfs.nrcan.gc.ca/biosim

For FTP users (note that this link is not accessible with web browsers): <ftp://ftp.cfl.forestry.ca/regniere/software/BioSIM/>.

For more information about the development of BioSIM:

https://github.com/RNCan/WeatherBasedSimulationFramework/wiki

BioSIM web API also provides an easy way to access BioSIM:

https://github.com/RNCan/BioSimClient\_CSharp/wiki/BioSIM-Web-API-Documentation

HTML example of BioSIM API:

<form action="http://repicea.dynu.net/biosim/BioSimModelEphemeral?" target="\_blank">

<table>

<tr>

<td align="right"><label for="lat">Latitude:</label></td>

<td align="left"><input type="text" id="lat" name="lat" value="46.75"></td>

</tr>

<tr>

<td align="right"><label for="long">Longitude:</label></td>

<td align="left"><input type="text" id="long" name="long" value="-71.5"></td>

</tr>

<tr>

<td align="right"><label for="from">From:</label></td>

<td align="left"><input type="text" id="from" name="from" value="2020"></td>

</tr>

<tr>

<td align="right"><label for="to">To:</label></td>

<td align="left"><input type="text" id="to" name="to" value="2022"></td>

</tr>

</table>

<input type="hidden" id="model" name="model" value="DegreeDay\_Annual">

<input type="hidden" id="Parameters" name="Parameters" value="LowerThreshold:5\*FirstDate:01/01">

<input type="submit" value="Get Annual Degree-days">

</form>

If you have any questions, please contact:  [Rémi Saint-Amant](mailto:remi.saint-amant@nrcan-rncan.gc.ca?subject=BioSIM).

