VPCsim Workshop

Requirements:
- Computer (Mac, Linux, or Windows) with an internet connection (No 'netbooks' or tablets)
- Web browser: Chrome, Firefox, or Safari – NOT Internet Explorer (yet)
- Spreadsheet program: OpenOffice, Excel, or others that can open csv files and make charts
- Imprudence Viewer: Install from provided thumbdrive or download latest stable version (1.3.1) from http://wiki.kokuaviewer.org/wiki/Downloads
- A username and password for the ScienceSim grid (provided for the workshop – for future access visit http://www.sciencesim.com)

About the VPCsim system:

The Virtual Plant Community Simulation (VPCsim) allows users to simulate a plant community within a 3D virtual environment. Using the system, visitors to the virtual environment can create a community with five plant species and up to 2500 individual plants. Using a webform users can control:
- the environment where the plants will grow:
  - the terrain
  - the pattern of soil drainage, salinity, and fertility across the landscape
- the characteristics of each plant species:
  - appearance
  - maximum lifespan
  - the optimal environment for each species and how much effect the environment has on fitness
- community dynamics:
  - what the community looks like at the simulation start (which plants are growing where at time step 0)
  - how well each species colonizes gaps or disturbed areas
  - how the species compete with each other
- patterns of disturbance:
  - areas that are permanently disturbed by human activities*
  - the rate of ongoing temporary human-caused disturbances**

Based on the user's choices, the system simulates changes in the community through 5000 time steps (arbitrary time units). From within the virtual environment users can:
- Experience being in the community as an avatar and view the community from many angles
- view changes in the plant community over time
- view steps in the simulation in any order
- interact with each other and share the results of their experiments
- log data which can be downloaded and plotted using spreadsheet tools
- try to explain the simulation results (expected or unexpected) based on the settings they selected, and rerun simulations with different settings to better understand the simulated biological processes

Specifically, users can perform experiments related to human impacts on the environment by running simulations starting with the exact same starting community but using different disturbance patterns.

* example: buildings, roads, or parking lots that permanently prevent plant regrowth
** example: fires, logging, or off-road vehicle damage that allow plant regrowth

Accessing the VPCsim system:

1. Open the Imprudence viewer.
2. Select 'sciencesim' from the list of default grids.
3. Change default viewer settings (one-time changes):
   1. From the Edit menu, select Preferences.
   2. On the Graphics tab click the Custom checkbox.
   3. Set the Draw distance slider to 512m.
   4. Set the Terrain slider to High.
   5. Press OK to save the changes.
4. Log in to ScienceSim:
   1. Enter the provided First name, Last name, and Password
   2. Set the Start location to 'My Home' or 'My Last Location'.
   3. Press the Log In button.
   4. Press cancel to reject the Vivox terms of service. We will not be using Vivox voice.
   5. Select 'No' when asked whether to have the client tag database automatically updated.
   6. After a few moments you should see your avatar standing (or hovering) in the virtual world.
5. Verify that you are in the correct region:
   1. The name of the region is displayed in the menu bar of the viewer.
   2. The region name should be 'vpcsim#' ('#' matches the number in your avatar name).
   3. If you are not in the correct region, select Teleport Home from the World menu.

Learning the viewer interface:

- Heads Up Display: Shows information about the simulated plant community.
- Chat bar: Type text to communicate with nearby avatars or to control the simulated plant community.
- Avatar controls: Move your avatar.
- Camera controls: Move your view separate from the avatar.
- World map: Shows nearby regions. Can be used to teleport to other workshop regions.
- Mini-map: Shows your location in the region and the locations of other avatars.
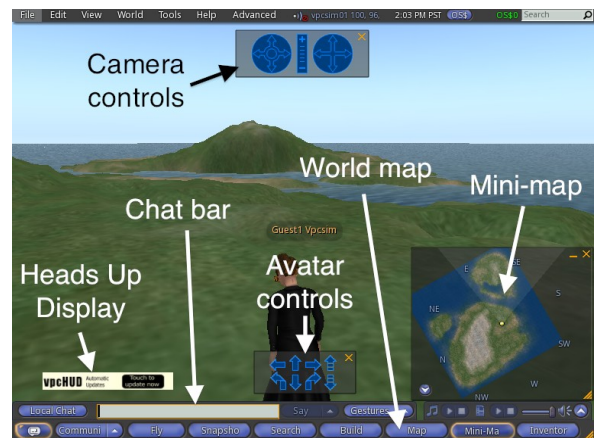
Mouse/keyboard controls:

- Moving your avatar:
  - Arrow keys: Move forward, back, turn left, turn right
  - Page Up: Hold to fly, press to jump or fly higher
  - Page Down: Hold to stop flying, press to crouch or fly lower
- Controlling your view/camera:
  - Alt + left-click: Focus camera on an object or location
  - Alt + left-click + mouse: Zoom in/out or rotate camera left and right
  - Alt + Ctrl + left-click + mouse: Zoom in/out or roll camera up and down
    Note- to return the camera to a position behind your avatar, start moving your avatar.
- Interacting with objects/avatars:
  - left-click: Touch an object or HUD button
  - right-click: Open a 'pie-menu' with additional options

Webform to setup or change the simulation parameters or download the log data:
http://vpcsim.aduffy70.org

Chat bar commands to control the VPCsim system:
- **/18 +**   Show the next step in the simulation
- **/18 -**   Show the previous step in the simulation
- **/18 step #**   Show a particular step in the simulation
- **/18 forward**   Start showing the next steps in the simulation automatically, one after another
- **/18 reverse**   Start showing the previous steps in the simulation automatically, one after another
- **/18 stop**   Stop automatically showing steps in the simulation
- **/18 reset**   Rerun the simulation and clear the data logs
  Note- every step that is shown is also logged.