Title: Quik Overview of LANDIS-II (64-bit)
Project Descriptor: LANDISII Programming Upgrades Project
Project ID: 2016SoE021_LANDIS_Upgrades/
Author: bmarron
Origin Date: 10 Sept 2016
Revision Date:

###################
Important websites
###################

http://www.landis-ii.org/home

===== STEP 1. Install LANDIS-II 6.0 (64-bit) ================================

a. Go to the LANDISII website (http://www.landis-ii.org/home)
a1. Follow the instructions under the 'Install' tab
(join users group, install LANDISII version, install four extensions)
a2. Go back to the main page and under the "Extensions" tab install the 'Cohort Statistics Output'
extension

==== STEP 2. Check installation of LANDIS-II and extensions ======================================

a. Open a (Administrator) Command Prompt
a1. Check access by running the LANDIS-II 'extensions installed?' query
a2. Run the extensions program, 'Landis.Extensions.exe'

```
C:\Program Files\LANDIS-II> landis-extensions
C:\Program Files\LANDIS-II\v6\bin> Landis.Extensions.exe
```

b. The following output is expected:

```
LANDIS-II 6.1
Extensions Administration Tool 6.1
Copyright 2005-2006 University of Wisconsin
Copyright 2011 Portland State University

Extension                Description
---------                -----------
Age-only Succession      Succession with age cohorts
Base Fire                Fire Disturbance
Base Wind                Wind Disturbance
Output Cohort Statistics This extension will produce outputs of cohort statistics
Output Max Species Age   Maximum age output maps
```

==== STEP 3. Get acquainted with the contents of \extensions dir ========================

a. examine the extensions listed as installed
a1. installation of extensions should automatically modified the file, 'extensions.xml':
a1. Open the 'extensions.xml' in Notepad

```
C:\Program Files\LANDIS-II\v6\bin\extensions\> start notepad "extensions.xml"
<?xml version="1.0" encoding="utf-8"?>
<ExtensionDataset xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XM…
  <Extensions>
    <Extension Name="Age-only Succession" Version="4.1">
      <Type>succession</Type>
      <Assembly>Landis.Extension.Succession.AgeOnly</Assembly>
```

```
      <Class>Landis.Extension.Succession.AgeOnly.PlugIn</Class>
      <Description>Succession with age cohorts</Description>
    </Extension>
    <Extension Name="Base Fire" Version="3.0.2">
      <Type>disturbance:fire</Type>
      <Assembly>Landis.Extension.BaseFire</Assembly>
      <Class>Landis.Extension.BaseFire.PlugIn</Class>
      <Description>Fire Disturbance</Description>
      <UserGuide>LANDIS-II Base Fire v3.0 User Guide.pdf</UserGuide>
    </Extension>
    <Extension Name="Base Wind" Version="2.1">
      <Type>disturbance:wind</Type>
      <Assembly>Landis.Extension.BaseWind</Assembly>
      <Class>Landis.Extension.BaseWind.PlugIn</Class>
      <Description>Wind Disturbance</Description>
      <UserGuide>LANDIS-II Base Wind v2.1 User Guide.pdf</UserGuide>
    </Extension>
    <Extension Name="Output Max Species Age" Version="2.0">
      <Type>output</Type>
      <Assembly>Landis.Extension.Output.MaxSpeciesAge</Assembly>
      <Class>Landis.Extension.Output.MaxSpeciesAge.PlugIn</Class>
      <Description>Maximum age output maps</Description>
      <UserGuide>LANDIS-II Output Max Species Age v2.0 User Guide.pdf</UserGuide>
    </Extension>
    <Extension Name="Output Cohort Statistics" Version="2.1.1">
      <Type>output</Type>
      <Assembly>Landis.Extension.Output.CohortStats</Assembly>
      <Class>Landis.Extension.Output.CohortStats.PlugIn</Class>
      <Description>This extension will produce outputs of cohort statistics</Description>
      <UserGuide>LANDIS-II Age Cohort Statistics v2.1 User Guide.pdf</UserGuide>
    </Extension>
  </Extensions>
</ExtensionDataset>
```

b. examine the .dll files added by installation of the four basic extensions plus the Cohort Statistics Output extension

```
C:\Program Files\LANDIS-II\v6\bin\extensions>dir
 Volume in drive C has no label.
 Volume Serial Number is 0AD8-74CB

 Directory of C:\Program Files\LANDIS-II\v6\bin\extensions

09/10/2016  07:07 AM    <DIR>          .
09/10/2016  07:07 AM    <DIR>          ..
09/10/2016  07:07 AM             1,969 extensions.xml
07/01/2014  08:54 AM            34,304 Landis.Extension.BaseFire.dll
09/19/2014  09:04 AM            26,624 Landis.Extension.BaseWind.dll
07/01/2014  09:39 AM            22,016 Landis.Extension.Output.CohortStats.dll
07/01/2014  10:03 AM            11,264 Landis.Extension.Output.MaxSpeciesAge.dll
02/17/2015  09:26 AM            16,384 Landis.Extension.Succession.AgeOnly.dll
08/18/2015  01:22 PM             9,728 Landis.Extensions.Dataset.dll
02/11/2015  03:19 PM            12,800 Landis.Library.AgeOnlyCohorts.dll
01/24/2011  04:25 PM             4,608 Landis.Library.Cohorts.dll
07/01/2014  01:22 PM            19,456 Landis.Library.Metadata.dll
02/12/2015  08:21 AM            27,136 Landis.Library.Succession.dll
              11 File(s)        186,289 bytes
               2 Dir(s)  219,453,005,824 bytes free
```

==== STEP 4. Run an example scenario ========================

a. go to the example scenario directory for the cohort-stats extension
a1. note the types files required to run LANDISII:

```
C:\Program Files\LANDIS-II\v6\examples\cohort-stats>dir
 Volume in drive C has no label.
 Volume Serial Number is 0AD8-74CB

 Directory of C:\Program Files\LANDIS-II\v6\examples\cohort-stats

09/10/2016  07:07 AM    <DIR>          .
09/10/2016  07:07 AM    <DIR>          ..
06/23/2014  03:25 PM             1,099 age-only-succession-dynamic-inputs.txt
07/01/2014  08:46 AM               259 age-only-succession.txt
06/23/2014  03:30 PM             1,332 base-fire-6.0.txt
06/23/2014  03:30 PM               910 cohort-stats.output.txt
06/23/2014  03:30 PM             9,929 ecoregions.gis
06/23/2014  03:30 PM               202 ecoregions.txt
06/23/2014  03:30 PM             9,929 initial-communities.gis
06/23/2014  03:30 PM             1,162 initial-communities.txt
06/23/2014  03:30 PM               135 max-spp-age.output.txt
09/10/2016  07:45 AM             1,029 scenario.txt
06/23/2014  03:30 PM               132 SimpleBatchFile.bat
06/23/2014  03:30 PM             1,915 species.txt
              14 File(s)         45,531 bytes
               4 Dir(s)  219,452,891,136 bytes free



        b. open the file 'scenario.txt' in a simple text editor
        b1. This file defines a LANDISII run; note the calls to other .txt and .gis files
        b2. This file defines an example scenario using Age-only Succession 4.1, Base Fire 6.0,
        and Cohort Statistics Output extensions
        b3. uncomment RandomNumberSeed; save changes

C:\Program Files\LANDIS-II\v6\examples\cohort-stats>start notepad 'scenario.txt'

-------------------------------------------------------------
LandisData  Scenario

Duration  50

Species   species.txt

Ecoregions      ./ecoregions.txt
EcoregionsMap   ./ecoregions.gis

CellLength  100 << meters, 100 x 100 m = 1 ha


>> NOTE:  This example assumes that you have downloaded and installed
>> the correpsonding extensions.  These extensions are currently packaged
>> together as a package.

>> Succession Extension     Initialization File
>> --------------------     -------------------
   "Age-only Succession"    age-only-succession.txt


>> Disturbance Extensions   Initialization File
>> ----------------------   -------------------
   "Base Fire"              base-fire-6.0.txt

   DisturbancesRandomOrder  yes  << optional parameter; default = no


>> Other Extensions         Initialization File
>> ----------------         -------------------
"Output Cohort Statistics"    cohort-stats.output.txt


RandomNumberSeed  4,357  << optional parameter; default = the seed is
                         << randomly generated using the current time
-------------------------------------------------------------------
```

c. run LANDIS using the scenario.txt file

```
C:\Program Files\LANDIS-II\v6\examples\cohort-stats>start /B SimpleBatchFile.bat
C:\Program Files\LANDIS-II\v6\examples\cohort-stats>call landis-ii scenario.txt

LANDIS-II 6.1 (official release)

Loading scenario from file "scenario.txt" ...
Initialized random number generator with user-supplied seed = 4,357
Loading species data from file "species.txt" ...
Loading ecoregions from file "./ecoregions.txt" ...
Initializing landscape from ecoregions map "./ecoregions.gis" ...
Cell length = 100 m, cell area = 1 ha
Map dimensions: 99 rows by 99 columns = 9,801 cells
Sites: 9,801 active (100.0 %), 0 inactive (0.0 %)
  reading in ecoregion from ./ecoregions.gis
Loading Age-only Succession extension ...
   Registering Data:  Succession.AgeCohorts.
   Loading dynamic input data from file "age-only-succession-dynamic-inputs.txt" ...
  Dynamic Input Parser:  Add new year = 0.
   Registering Data:  TimeOfLastSuccession.
   Registering Data:  Shade.
   Creating Dispersal Neighborhood List.
   Dispersal:  NeighborRadius=5050, CellLength=100, numCellRadius=50
   Loading initial communities from file "./initial-communities.txt" ...
   Reading initial communities map "./initial-communities.gis" ...
Loading Base Fire extension ...
   Registering Data:  Fire.Severity.
   Loading FireRegion data...
   Opening Fire log file "fire-log.csv" ...
Loading Output Cohort Statistics extension ...
Running Output Cohort Statistics ...
   Writing MIN map for tsugcana to spp-age-stats/tsugcana-MIN-0.img ...
dataset created: spp-age-stats/tsugcana-MIN-0.img
   Writing MIN map for betupapy to spp-age-stats/betupapy-MIN-0.img ...
dataset created: spp-age-stats/betupapy-MIN-0.img
   Writing MAX map for tsugcana to spp-age-stats/tsugcana-MAX-0.img ...
dataset created: spp-age-stats/tsugcana-MAX-0.img
   Writing MED map for tsugcana to spp-age-stats/tsugcana-MED-0.img ...
dataset created: spp-age-stats/tsugcana-MED-0.img
   Writing SD map for tsugcana to spp-age-stats/tsugcana-SD-0.img ...
dataset created: spp-age-stats/tsugcana-SD-0.img
   Writing AVG map for tsugcana to spp-age-stats/tsugcana-AVG-0.img ...
dataset created: spp-age-stats/tsugcana-AVG-0.img
   Writing MIN site map to spp-age-stats/AGE-MIN-0.img ...
dataset created: spp-age-stats/AGE-MIN-0.img
   Writing MAX site map to spp-age-stats/AGE-MAX-0.img ...
dataset created: spp-age-stats/AGE-MAX-0.img
   Writing MED site map to spp-age-stats/AGE-MED-0.img ...
dataset created: spp-age-stats/AGE-MED-0.img
   Writing AVG site map to spp-age-stats/AGE-AVG-0.img ...
dataset created: spp-age-stats/AGE-AVG-0.img
   Writing RICH site map to spp-age-stats/AGE-RICH-0.img ...
dataset created: spp-age-stats/AGE-RICH-0.img
   Writing EVEN site map to spp-age-stats/AGE-EVEN-0.img ...
dataset created: spp-age-stats/AGE-EVEN-0.img
   Writing COUNT site map to spp-age-stats/AGE-COUNT-0.img ...
dataset created: spp-age-stats/AGE-COUNT-0.img
   Writing RICH site map to spp-age-stats/SPP-RICH-0.img ...
dataset created: spp-age-stats/SPP-RICH-0.img
Current time: 5
Running Base Fire ...
   Processing landscape for Fire events ...
dataset created: fire/severity-5.img
Running Age-only Succession ...
Current time: 10
Running Base Fire ...
   Processing landscape for Fire events ...
dataset created: fire/severity-10.img
Running Age-only Succession ...
```

```
Ageing cohorts ...
% done:   0%  10%  20%  30%  40%  50%  60%  70%  80%  90%  100%
          |----|----|----|----|----|----|----|----|----|----|
Progress: ++++++++++++++++++++++++++++++++++++++++++++++++++
Computing shade ...
% done:   0%  10%  20%  30%  40%  50%  60%  70%  80%  90%  100%
          |----|----|----|----|----|----|----|----|----|----|
Progress: ++++++++++++++++++++++++++++++++++++++++++++++++++
Cohort reproduction ...
% done:   0%  10%  20%  30%  40%  50%  60%  70%  80%  90%  100%
          |----|----|----|----|----|----|----|----|----|----|
Progress: ++++++++++++++++++++++++++++++++++++++++++++++++++
Running Output Cohort Statistics ...
   Writing MIN map for tsugcana to spp-age-stats/tsugcana-MIN-10.img ...
dataset created: spp-age-stats/tsugcana-MIN-10.img
   Writing MIN map for betupapy to spp-age-stats/betupapy-MIN-10.img ...
dataset created: spp-age-stats/betupapy-MIN-10.img
   Writing MAX map for tsugcana to spp-age-stats/tsugcana-MAX-10.img ...
dataset created: spp-age-stats/tsugcana-MAX-10.img
   Writing MED map for tsugcana to spp-age-stats/tsugcana-MED-10.img ...
dataset created: spp-age-stats/tsugcana-MED-10.img
   Writing SD map for tsugcana to spp-age-stats/tsugcana-SD-10.img ...
dataset created: spp-age-stats/tsugcana-SD-10.img
   Writing AVG map for tsugcana to spp-age-stats/tsugcana-AVG-10.img ...
dataset created: spp-age-stats/tsugcana-AVG-10.img
   Writing MIN site map to spp-age-stats/AGE-MIN-10.img ...
dataset created: spp-age-stats/AGE-MIN-10.img
   Writing MAX site map to spp-age-stats/AGE-MAX-10.img ...
dataset created: spp-age-stats/AGE-MAX-10.img
   Writing MED site map to spp-age-stats/AGE-MED-10.img ...
dataset created: spp-age-stats/AGE-MED-10.img
   Writing AVG site map to spp-age-stats/AGE-AVG-10.img ...
dataset created: spp-age-stats/AGE-AVG-10.img
   Writing RICH site map to spp-age-stats/AGE-RICH-10.img ...
dataset created: spp-age-stats/AGE-RICH-10.img
   Writing EVEN site map to spp-age-stats/AGE-EVEN-10.img ...
dataset created: spp-age-stats/AGE-EVEN-10.img
   Writing COUNT site map to spp-age-stats/AGE-COUNT-10.img ...
dataset created: spp-age-stats/AGE-COUNT-10.img
   Writing RICH site map to spp-age-stats/SPP-RICH-10.img ...
dataset created: spp-age-stats/SPP-RICH-10.img
Current time: 15
Running Base Fire ...
   Processing landscape for Fire events ...
dataset created: fire/severity-15.img
Running Age-only Succession ...
Current time: 20
Running Base Fire ...
   Processing landscape for Fire events ...
   Reading in new Fire Regions Map ecoregions.gis.
dataset created: fire/severity-20.img
Running Age-only Succession ...
Ageing cohorts ...
% done:   0%  10%  20%  30%  40%  50%  60%  70%  80%  90%  100%
          |----|----|----|----|----|----|----|----|----|----|
Progress: ++++++++++++++++++++++++++++++++++++++++++++++++++
Computing shade ...
% done:   0%  10%  20%  30%  40%  50%  60%  70%  80%  90%  100%
          |----|----|----|----|----|----|----|----|----|----|
Progress: ++++++++++++++++++++++++++++++++++++++++++++++++++
Cohort reproduction ...
% done:   0%  10%  20%  30%  40%  50%  60%  70%  80%  90%  100%
          |----|----|----|----|----|----|----|----|----|----|
Progress: ++++++++++++++++++++++++++++++++++++++++++++++++++
Running Output Cohort Statistics ...
   Writing MIN map for tsugcana to spp-age-stats/tsugcana-MIN-20.img ...
dataset created: spp-age-stats/tsugcana-MIN-20.img
   Writing MIN map for betupapy to spp-age-stats/betupapy-MIN-20.img ...
dataset created: spp-age-stats/betupapy-MIN-20.img
   Writing MAX map for tsugcana to spp-age-stats/tsugcana-MAX-20.img ...
dataset created: spp-age-stats/tsugcana-MAX-20.img
```

```
   Writing MED map for tsugcana to spp-age-stats/tsugcana-MED-20.img ...
dataset created: spp-age-stats/tsugcana-MED-20.img
   Writing SD map for tsugcana to spp-age-stats/tsugcana-SD-20.img ...
dataset created: spp-age-stats/tsugcana-SD-20.img
   Writing AVG map for tsugcana to spp-age-stats/tsugcana-AVG-20.img ...
dataset created: spp-age-stats/tsugcana-AVG-20.img
   Writing MIN site map to spp-age-stats/AGE-MIN-20.img ...
dataset created: spp-age-stats/AGE-MIN-20.img
   Writing MAX site map to spp-age-stats/AGE-MAX-20.img ...
dataset created: spp-age-stats/AGE-MAX-20.img
   Writing MED site map to spp-age-stats/AGE-MED-20.img ...
dataset created: spp-age-stats/AGE-MED-20.img
   Writing AVG site map to spp-age-stats/AGE-AVG-20.img ...
dataset created: spp-age-stats/AGE-AVG-20.img
   Writing RICH site map to spp-age-stats/AGE-RICH-20.img ...
dataset created: spp-age-stats/AGE-RICH-20.img
   Writing EVEN site map to spp-age-stats/AGE-EVEN-20.img ...
dataset created: spp-age-stats/AGE-EVEN-20.img
   Writing COUNT site map to spp-age-stats/AGE-COUNT-20.img ...
dataset created: spp-age-stats/AGE-COUNT-20.img
   Writing RICH site map to spp-age-stats/SPP-RICH-20.img ...
dataset created: spp-age-stats/SPP-RICH-20.img
Current time: 25
Running Base Fire ...
   Processing landscape for Fire events ...
dataset created: fire/severity-25.img
Running Age-only Succession ...
Current time: 30
Running Base Fire ...
   Processing landscape for Fire events ...
dataset created: fire/severity-30.img
Running Age-only Succession ...
Ageing cohorts ...
% done:   0%  10%  20%  30%  40%  50%  60%  70%  80%  90%  100%
          |----|----|----|----|----|----|----|----|----|----|
Progress: ++++++++++++++++++++++++++++++++++++++++++++++++++++
Computing shade ...
% done:   0%  10%  20%  30%  40%  50%  60%  70%  80%  90%  100%
          |----|----|----|----|----|----|----|----|----|----|
Progress: ++++++++++++++++++++++++++++++++++++++++++++++++++++
Cohort reproduction ...
% done:   0%  10%  20%  30%  40%  50%  60%  70%  80%  90%  100%
          |----|----|----|----|----|----|----|----|----|----|
Progress: ++++++++++++++++++++++++++++++++++++++++++++++++++++
Running Output Cohort Statistics ...
   Writing MIN map for tsugcana to spp-age-stats/tsugcana-MIN-30.img ...
dataset created: spp-age-stats/tsugcana-MIN-30.img
   Writing MIN map for betupapy to spp-age-stats/betupapy-MIN-30.img ...
dataset created: spp-age-stats/betupapy-MIN-30.img
   Writing MAX map for tsugcana to spp-age-stats/tsugcana-MAX-30.img ...
dataset created: spp-age-stats/tsugcana-MAX-30.img
   Writing MED map for tsugcana to spp-age-stats/tsugcana-MED-30.img ...
dataset created: spp-age-stats/tsugcana-MED-30.img
   Writing SD map for tsugcana to spp-age-stats/tsugcana-SD-30.img ...
dataset created: spp-age-stats/tsugcana-SD-30.img
   Writing AVG map for tsugcana to spp-age-stats/tsugcana-AVG-30.img ...
dataset created: spp-age-stats/tsugcana-AVG-30.img
   Writing MIN site map to spp-age-stats/AGE-MIN-30.img ...
dataset created: spp-age-stats/AGE-MIN-30.img
   Writing MAX site map to spp-age-stats/AGE-MAX-30.img ...
dataset created: spp-age-stats/AGE-MAX-30.img
   Writing MED site map to spp-age-stats/AGE-MED-30.img ...
dataset created: spp-age-stats/AGE-MED-30.img
   Writing AVG site map to spp-age-stats/AGE-AVG-30.img ...
dataset created: spp-age-stats/AGE-AVG-30.img
   Writing RICH site map to spp-age-stats/AGE-RICH-30.img ...
dataset created: spp-age-stats/AGE-RICH-30.img
   Writing EVEN site map to spp-age-stats/AGE-EVEN-30.img ...
dataset created: spp-age-stats/AGE-EVEN-30.img
   Writing COUNT site map to spp-age-stats/AGE-COUNT-30.img ...
dataset created: spp-age-stats/AGE-COUNT-30.img
```

```
   Writing RICH site map to spp-age-stats/SPP-RICH-30.img ...
dataset created: spp-age-stats/SPP-RICH-30.img
Current time: 35
Running Base Fire ...
   Processing landscape for Fire events ...
dataset created: fire/severity-35.img
Running Age-only Succession ...
Current time: 40
Running Base Fire ...
   Processing landscape for Fire events ...
dataset created: fire/severity-40.img
Running Age-only Succession ...
Ageing cohorts ...
% done:   0%  10%  20%  30%  40%  50%  60%  70%  80%  90%  100%
          |----|----|----|----|----|----|----|----|----|----|
Progress: ++++++++++++++++++++++++++++++++++++++++++++++++++
Computing shade ...
% done:   0%  10%  20%  30%  40%  50%  60%  70%  80%  90%  100%
          |----|----|----|----|----|----|----|----|----|----|
Progress: ++++++++++++++++++++++++++++++++++++++++++++++++++
Cohort reproduction ...
% done:   0%  10%  20%  30%  40%  50%  60%  70%  80%  90%  100%
          |----|----|----|----|----|----|----|----|----|----|
Progress: ++++++++++++++++++++++++++++++++++++++++++++++++++
Running Output Cohort Statistics ...
   Writing MIN map for tsugcana to spp-age-stats/tsugcana-MIN-40.img ...
dataset created: spp-age-stats/tsugcana-MIN-40.img
   Writing MIN map for betupapy to spp-age-stats/betupapy-MIN-40.img ...
dataset created: spp-age-stats/betupapy-MIN-40.img
   Writing MAX map for tsugcana to spp-age-stats/tsugcana-MAX-40.img ...
dataset created: spp-age-stats/tsugcana-MAX-40.img
   Writing MED map for tsugcana to spp-age-stats/tsugcana-MED-40.img ...
dataset created: spp-age-stats/tsugcana-MED-40.img
   Writing SD map for tsugcana to spp-age-stats/tsugcana-SD-40.img ...
dataset created: spp-age-stats/tsugcana-SD-40.img
   Writing AVG map for tsugcana to spp-age-stats/tsugcana-AVG-40.img ...
dataset created: spp-age-stats/tsugcana-AVG-40.img
   Writing MIN site map to spp-age-stats/AGE-MIN-40.img ...
dataset created: spp-age-stats/AGE-MIN-40.img
   Writing MAX site map to spp-age-stats/AGE-MAX-40.img ...
dataset created: spp-age-stats/AGE-MAX-40.img
   Writing MED site map to spp-age-stats/AGE-MED-40.img ...
dataset created: spp-age-stats/AGE-MED-40.img
   Writing AVG site map to spp-age-stats/AGE-AVG-40.img ...
dataset created: spp-age-stats/AGE-AVG-40.img
   Writing RICH site map to spp-age-stats/AGE-RICH-40.img ...
dataset created: spp-age-stats/AGE-RICH-40.img
   Writing EVEN site map to spp-age-stats/AGE-EVEN-40.img ...
dataset created: spp-age-stats/AGE-EVEN-40.img
   Writing COUNT site map to spp-age-stats/AGE-COUNT-40.img ...
dataset created: spp-age-stats/AGE-COUNT-40.img
   Writing RICH site map to spp-age-stats/SPP-RICH-40.img ...
dataset created: spp-age-stats/SPP-RICH-40.img
Current time: 45
Running Base Fire ...
   Processing landscape for Fire events ...
dataset created: fire/severity-45.img
Running Age-only Succession ...
Current time: 50
Running Base Fire ...
   Processing landscape for Fire events ...
dataset created: fire/severity-50.img
Running Age-only Succession ...
Ageing cohorts ...
% done:   0%  10%  20%  30%  40%  50%  60%  70%  80%  90%  100%
          |----|----|----|----|----|----|----|----|----|----|
Progress: ++++++++++++++++++++++++++++++++++++++++++++++++++
Computing shade ...
% done:   0%  10%  20%  30%  40%  50%  60%  70%  80%  90%  100%
          |----|----|----|----|----|----|----|----|----|----|
Progress: ++++++++++++++++++++++++++++++++++++++++++++++++++
```

```
Cohort reproduction ...
% done:   0%  10%  20%  30%  40%  50%  60%  70%  80%  90%  100%
          |----|----|----|----|----|----|----|----|----|----|
Progress: ++++++++++++++++++++++++++++++++++++++++++++++++++
Running Output Cohort Statistics ...
   Writing MIN map for tsugcana to spp-age-stats/tsugcana-MIN-50.img ...
dataset created: spp-age-stats/tsugcana-MIN-50.img
   Writing MIN map for betupapy to spp-age-stats/betupapy-MIN-50.img ...
dataset created: spp-age-stats/betupapy-MIN-50.img
   Writing MAX map for tsugcana to spp-age-stats/tsugcana-MAX-50.img ...
dataset created: spp-age-stats/tsugcana-MAX-50.img
   Writing MED map for tsugcana to spp-age-stats/tsugcana-MED-50.img ...
dataset created: spp-age-stats/tsugcana-MED-50.img
   Writing SD map for tsugcana to spp-age-stats/tsugcana-SD-50.img ...
dataset created: spp-age-stats/tsugcana-SD-50.img
   Writing AVG map for tsugcana to spp-age-stats/tsugcana-AVG-50.img ...
dataset created: spp-age-stats/tsugcana-AVG-50.img
   Writing MIN site map to spp-age-stats/AGE-MIN-50.img ...
dataset created: spp-age-stats/AGE-MIN-50.img
   Writing MAX site map to spp-age-stats/AGE-MAX-50.img ...
dataset created: spp-age-stats/AGE-MAX-50.img
   Writing MED site map to spp-age-stats/AGE-MED-50.img ...
dataset created: spp-age-stats/AGE-MED-50.img
   Writing AVG site map to spp-age-stats/AGE-AVG-50.img ...
dataset created: spp-age-stats/AGE-AVG-50.img
   Writing RICH site map to spp-age-stats/AGE-RICH-50.img ...
dataset created: spp-age-stats/AGE-RICH-50.img
   Writing EVEN site map to spp-age-stats/AGE-EVEN-50.img ...
dataset created: spp-age-stats/AGE-EVEN-50.img
   Writing COUNT site map to spp-age-stats/AGE-COUNT-50.img ...
dataset created: spp-age-stats/AGE-COUNT-50.img
   Writing RICH site map to spp-age-stats/SPP-RICH-50.img ...
dataset created: spp-age-stats/SPP-RICH-50.img
Model run is complete.
```

d. re-examine the cohort-stats directory
d1. Note new files and directories

```
C:\Program Files\LANDIS-II\v6\examples\cohort-stats>dir
 Volume in drive C has no label.
 Volume Serial Number is 0AD8-74CB

 Directory of C:\Program Files\LANDIS-II\v6\examples\cohort-stats

09/10/2016  07:07 AM    <DIR>          .
09/10/2016  07:07 AM    <DIR>          ..
06/23/2014  03:25 PM             1,099 age-only-succession-dynamic-inputs.txt
07/01/2014  08:46 AM               259 age-only-succession.txt
06/23/2014  03:30 PM             1,332 base-fire-6.0.txt
06/23/2014  03:30 PM               910 cohort-stats.output.txt
06/23/2014  03:30 PM             9,929 ecoregions.gis
06/23/2014  03:30 PM               202 ecoregions.txt
09/10/2016  08:01 AM    <DIR>          fire
09/10/2016  08:01 AM             5,089 fire-log.csv
06/23/2014  03:30 PM             9,929 initial-communities.gis
06/23/2014  03:30 PM             1,162 initial-communities.txt
09/10/2016  08:01 AM            12,409 Landis-log.txt
06/23/2014  03:30 PM               135 max-spp-age.output.txt
09/10/2016  07:45 AM             1,029 scenario.txt
06/23/2014  03:30 PM               132 SimpleBatchFile.bat
06/23/2014  03:30 PM             1,915 species.txt
09/10/2016  08:01 AM    <DIR>          spp-age-stats
              14 File(s)         45,531 bytes
               4 Dir(s)  219,452,891,136 bytes free
```

```
==== STEP 5. Examine the results in R ======================================


        a. Open RStudio, load libraries, and some output files

> library(raster)
> library(sp)
> library(rgdal)

> test<- paste("C:/Program Files/LANDIS-II/v6/examples/cohort-stats/initial-communities.gis", sep="")
> raster.test <- raster(test)

> test2<- paste("C:/Program Files/LANDIS-II/v6/examples/cohort-stats/spp-age-stats/AGE-COUNT-0.img", sep="")
> raster.test2 <- raster(test2)

> test3<- paste("C:/Program Files/LANDIS-II/v6/examples/cohort-stats/fire/severity-10.img", sep="")
> raster.test3 <- raster(test3)


        b. examine the results

> raster.test
> freq(raster.test)
> plot(raster.test)

        c. look at the output files sequentially

iteratePlots <- function(x){

    oask <- devAskNewPage(TRUE)
    on.exit(devAskNewPage(oask))

    for (i in seq_along(x)) {

        plot(x[[i]])
    }
}


x<- c(
test,
test2,
test3
)
```