

# VegDRI Project Software Development Overview

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Version 1.2

This document will discuss the various concepts of the software development on the VegDRI project. These concepts include the overall software structure, the version control system (CVS), and change requests (CRs) in the GNATS system for the VegDRI project. This document is meant to be a flexible document that will grow and change with the needs of the project.

## Overall Software Structure

Figure 1 shows the overall software structure for the VegDRI project. The top level directory will be the `vegdr` directory. At the next level, COTS/GOTS software (TIFF, GeoTIFF, GDAL, etc.) will be located in the `COTS` directory. The VegDRI Applications will be stored under the `src` directory. Each application will have a separate directory under `src`, based on the application name, which will contain the source, include, and make files for that application. When built, the C-application binary files will be stored in the `bin` directory, under the main `vegdr` directory. Any shared source files will be stored in the `shared_src` directory. The makefile for the `shared_src` directory will create a `libvegdr.a` file which will be used by each of the C applications, if needed. The script/daemon files will be stored in the `script` directory. If the complexity of the scripts requires subdirectories to be created under the `script` directory, those subdirectories will be created on an as-needed basis.

The Augustana smoother and ND2D code will be stored under the `src/augie_code` directory, even though the EROS VegDRI team itself did not originally develop that code. The mapCubist model code will be stored under the `src/mapcubist` directory. Generally external code is stored in a separate directory (and possibly not even put under version control). However, the EROS VegDRI team will be modifying both the Augustana and mapCubist model software, therefore it will be maintained under version control.

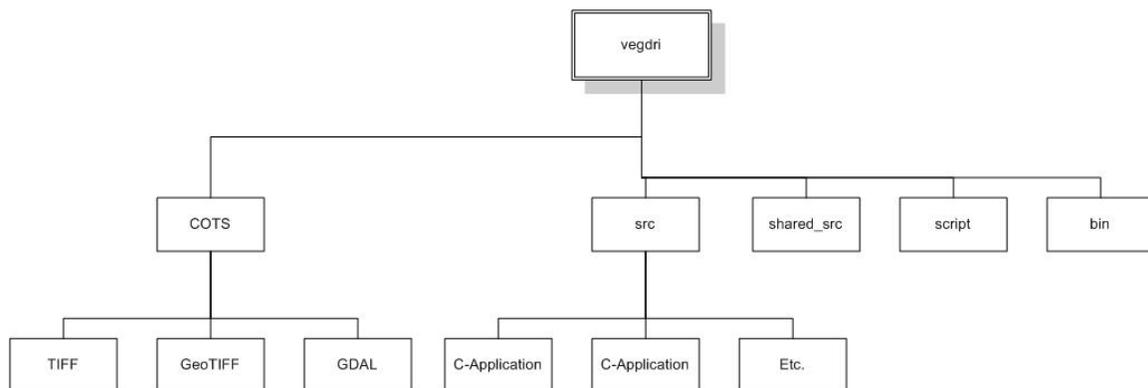


Figure 1 – Overall VegDRI Software Directory Structure

The project will use environment variables to point to libraries and include files in the COTS directory. TIFF\_LIB, TIFF\_INC, GEOTIFF\_LIB, GEOTIFF\_INC, GDAL\_LIB, and GDAL\_INC are the current environment variables that will be needed. The VEGDRI\_HOME environment variable will point to the top-level vegdri directory. Other environment variables may need to be added as the project moves forward. In addition, since the source code in the shared\_src directory will be compiled into a VegDRI library, there will need to be a VEGDRI\_LIB and VEGDRI\_INC environment variable.

### Version Control System

The VegDRI software development team will use CVS as the version control system for the software. The COTS/GOTS software will not be maintained under CVS, thus the COTS directory will not be needed in VegDRI CVS repository. Also, the C-binaries will not be maintained under version control, thus the bin directory will not be needed in the VegDRI CVS repository. For the C-applications, only the .c, .h, and makefile files will be maintained under version control. Object files, executables, and libraries will not be maintained, since they can be built from the source code. Figure 2 shows the overall CVS directory structure for the VegDRI project.

When checking out code in the VegDRI repository, the code should be checked out on a branch using the makebranch utility (available in the CVS\_Utils directory at the same level as the main vegdri directory). If the work being done is tied to a change request (CR), the specific module should be checked out using the CR number (ex. makebranch <module> cr<CR\_num>). Before releasing the VegDRI software, the necessary branches will be merged back into the trunk for integration testing and the final release.

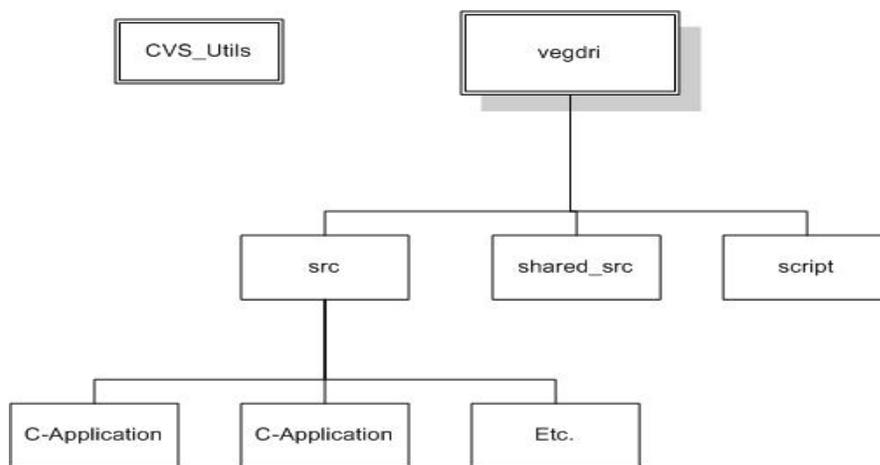


Figure 2 – Overall VegDRI CVS Directory Structure

Given that the VegDRI project will be receiving software deliveries for the mapCubist and Augustana software, the original source code for this software will need to be tagged

using the external source's version number. The tag scheme for the Augustana code will be `augie_vMmm` and the tag scheme for the mapcubist code will be `mc_vMmm`. For example, the Augustana v6.11 release of the software will have a tag of `augie_v611` in the VegDRI CVS repository. In addition, the Augustana code will be stored all in one directory, even though there are several executables which are built from this code. The VegDRI project desires to minimize the number of changes required to the external software deliveries.

The VegDRI customer has an interest in being able to use different versions of the mapCubist code while testing new versions of the Cubist model. For this reason, the mapCubist code will be tagged with the appropriate version number (as discussed above). The overall build script will check out each version of the mapCubist software and build the various versions with an executable name of `mapcubist_vMmm`. (For example, the v1.09 mapCubist software will have an executable name of `mapcubist_v109`.) Thus the VegDRI `bin` directory will have several `mapcubist_Mmm` executables. The project will maintain a `MAPCUBIST_VER` environment variable to specify which version of the mapCubist code will be run by the VegDRI processing system. The environment variable will contain the major and minor version digits without any punctuation (Mmm). Thus, v1.09 would be specified in the `MAPCUBIST_VER` environment variable as 109, and v2.02 would be designated as 202.

The mapCubist software will be stored on a branch for each version. All other software will be merged back into the head, except the mapCubist software. In order to check out the latest and greatest VegDRI team modified software, a release tag will be needed to get the appropriate version of the software. To check out the latest version of the VegDRI-modified version of mapCubist do the following, depending on which version of the software you desire. To specify a specific directory for the mapCubist code (it will be `mapcubist` by default, regardless of the tag) the '-d' command-line option can be used.

```
cvs co -r mc_v109_mod [-d mapcubist_v109] mapCubist
cvs co -r mc_v202_mod [-d mapcubist_v202] mapCubist
```

The original version of the mapCubist software (not modified by the VegDRI team) is tagged in CVS with the `mc_v109` and `mc_v202` tags, for version 1.09 and version 2.02 respectively. If new versions of the mapCubist software are obtained, they can be checked out using similar release tags.

### Change Requests

Change requests (CRs) will be submitted via GNATS by the VegDRI SPL to address issues and requests raised by the customer. In addition, software team members may submit CRs to address any issues that may need addressed in the software. The SPL will, with the customer's approval, approve CRs for work. When a CR has been approved, the status of the CR will be changed by the SPL to *approved* and the CR will be assigned to a developer. Some CRs will require the developer to think about a design and other CRs will be simple enough to allow the developer to go directly into development. In either case, the developer should change the CR status to *design* or *implementing* at the time

work starts on the CR. When development of a change request is complete, then the developer should change the status of the CR to *testing*. Once unit testing has been completed, the developer should change the status of the CR to *testing complete*.

Once unit testing has been completed, then the CR is ready for integration testing. Once the particular version of the system has been released, the SPL will change the status of any released CRs to *complete* and note the version number and release date in the GNATS system.