Edward M. Debevec and Eric A. Rexstad
Institute of Arctic Biology
University of Alaska Fairbanks
Fairbanks, AK 99775
USA

Creating Online R Functions with deliveR

Web delivery of R functions has many advantages. Updates to the data and the functions themselves only need to happen on the server, users with no R experience can quickly implement the functions without having to learn R, and the functions are accessible worldwide. The disadvantage has been that the developer must be familiar with HTML and a CGI language such as PHP or Perl. At its most basic, an Online R Function (ORF) consists of two files: (1) an HTML web form to input arguments to the function and (2) a CGI script to create an R script that calls the function and handles the output, run the script in batch mode, and then deliver the function results to the user as images (png, jpg, or bmp) and/or files to be downloaded (comma delimited or HTML). We have created a tool called deliveR to generate these two ORF files without any coding required.

deliveR consists of three components: (1) an HTML web form to input details of the function to be delivered online, (2) a CGI file that creates the two ORF files to deliver the function, and (3) a library of R functions that are used by the ORF to create temporary directories, open and close graphics devices, and write output data frames to files. The function to be delivered online does not require any special modification; it can create any number of graphics and/or output a data frame or list of data frames. With the web form, the R developer defines input arguments to the function, whether they will appear in the ORF as text boxes or pull down select boxes, and their default text or select options. The developer also sets whether the output from the ORF will be graphics, data files, or both. When submitted, the CGI script creates the HTML and CGI files previously described that make up the ORF.

We demonstrate the use of deliveR using a suite of ecological analyses that produce multiple graphics and data output. A library of Online R Functions can be quickly created and made available to users worldwide. deliveR is available for Windows and Unix platforms and comes with both PHP and Perl CGI scripts.