Figure preparation for technical publications

It is our goal to help you produce high quality figures that are compatible with our electronic publishing requirements. This section explains how to prepare and submit figures for publication.

## Preferred graphic types

Vector graphics such as .eps files deliver high quality art when scaled up while maintaining smaller file size. Raster graphics such as .jpg, .tiff, and .png are optimal for artwork that includes digital photos but unlike vector graphics, loses in image quality occurs when scaled up. Unless your figures include photos, it is best to prepare graphics in vector format.

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| Format | File Type | Explanation  |
| vector | .eps | Best for line art and curves. Uses mathematical equations known as vector paths. Can be scaled up without losing image quality with minimal effect on file size.  |
| raster | .jpg.tif.png | Best for photographic images. Resolution between 300 and 600 PPI at final print size. Use LZE compression for .tif files.  |
| portabledocumentfile | .pdf | Can contain a combination of vector- or raster-basedelements. Programs such as PowerPoint and Excel can be used to export art as press quality PDFs.  |

For more information on vector and raster graphics visit: <https://vectr.com/tutorials/what-are-vector-graphics/>

## Color Mode and Resolution Requirements

Files should be saved in RGB color mode or grayscale. Resolution for raster-based graphics should be at minimum 300-600 PPI, and designed to occupy either a single column (3.33 in.) or the width of two columns (6.83 in.).

## File size

Figures should maintain a file size no greater than 20 MB. To reduce the file size of complex raster-based art, consider combining vector elements with raster. For example, keep photographs in raster format and add type or line art using a vector editing program.

## Recommended font types and sizing

Use 8-point Arial or Helvetica in bold for axis titles and 8-point Helvetica or Arial for body copy inside figures (if any). *Subscript and superscript should be 6 points.*

## Multipart Figures

Combine multipart figures into one file and ensure the figure file is labeled sequentially with lowercase letters to be referenced in-text and in the figure’s caption. The number of figure captions should equal the number of figure files.

## Artwork Permissions

Figures, photos, or otherwise that have copyright or contain proprietary data should not be submitted without written permission from the copyright holder to reuse. Along with providing SPE of the permissions to reuse documentation, the source of reproduced or modified figures should be cited the in the figure caption (for example: Fig. 1–Regions of the hypothetical Richardson Reservoir reproduced from George et al. 2019).

## Graphical editing programs

Several graphics software packages are available to help create high-quality graphics. A list of potential programs is provided as a general resource:

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| Program  | Use |
| Adobe Photoshop | premier raster editing program |
| Adobe Illustrator | premier vector editing program |
| Microsoft PowerPoint | can be used to create, combine, and edit images containing both raster and vector elements |
| Microsoft Excel | not recommended for figure production except charts or graphs generated from cell data |
| CorelDraw | can produce high-quality raster files such as .tif or .jpg |
| GIMP | a free raster editing program capable of producing high-quality raster images ([www.gimp.org](https://www.gimp.org/)) |
| Inkscape | a free vector editing program capable of producing high-quality vector art and exporting as .eps (<https://inkscape.org/en/>). |

*SPE does not endorse any specific editing programs and is not responsible for use. The list of potential programs is provided as a general resource. If your editing program of choice is not listed and you would like to submit a recommendation, please e-mail* *peer@spe.org**.*

## Figure prep checklist

Before submitting your files, please be sure of the following:

* Color images are created and saved in RGB color mode.
* Raster-based art should have a resolution of 300-600 PPI.
* The type in the figure uses a standard font: Arial or Helvetica.
* The lettering in the figure have an 8-point font size.
* *SPE Peer Reviewed Journals requirement:* at revision, upload figures as separate files, in any of the following formats: .eps, .tif, .jpg, .png or .pdf.