

ELECTRONIC ARTWORK – AN INTRODUCTION

Our series of guides introduces you to electronic artwork, our standard formats and the benefits of using them

Preferred Formats

We have three preferred formats for electronic artwork that mirror the standards of the publishing industry:

EPS (Encapsulated PostScript) – This keeps text and lines sharp at all sizes, as they are described by scaleable vectors rather than made up of pixels. EPS can also contain embedded photographic images; these should be of high resolution and ideally in TIFF format.

File extension: .eps

Recommended for: line art and combinations of photographs and labelling

PDF (Portable Document Format) – This is a format that is similar in many ways to EPS, and is another format of vector image. Great care must be taken that embedded images are not reduced in quality when creating a PDF. You can visually check this by zooming in on the created PDF.

File extension: .pdf

Recommended for: line art and combinations of photographs and labelling

TIFF (Tagged Image File Format) – A format that breaks an image down into little blocks, called pixels (from 'picture element'). Each pixel has a precise position and colour. If there are enough pixels then the image is very sharp and we say that it is of 'high resolution'. An image made up of pixels in this way is also known as a 'raster' image.

File extension: .tif

Recommended for: photographic images

These three standard formats are independent of any particular operating system or computer program. While we may be able to use other formats, it is best that you supply figures as TIFF, EPS or PDF.

Most graphics programs can 'Save as ...' or 'Export' images as TIFF or EPS, and you can create EPS or PDF from any program using a PostScript printer driver or PDF creation software, which are widely available.

Colour Modes – Monochrome, Grayscale, RGB (online) and CMYK (print)

Monochrome art (black on white) should be in 'bitmap' mode (also called 1-bit).

Grayscale art should be in 'grayscale' mode, a palette of colours that has 256 shades ranging from white to black (also called 8-bit).

Colour art destined for print publication should be in CMYK mode. CMYK stands for Cyan, Magenta, Yellow and Black (key) – these are the base colours used in the printing process.

Colour art destined for online publication should be in RGB mode. RGB stands for Red, Green and Blue – these are the colours that are displayed by computer monitors.

Good Practice

Use standard fonts that are legible and of an appropriate size. We recommend the following fonts: Times, Times New Roman, Arial and Helvetica.

Make sure that any labelling is legible against the background, and that lines are of a suitable thickness. Also check that images are sharp and contain a large number of pixels – zoom in on the image to check its quality.

Please use standard formats, and avoid supplying files in a format native to a particular program or operating system. See the Further Guides section below for unsuitable formats and reasons for avoiding them.

As the range of colours available in RGB is slightly different from CMYK please create your files in the appropriate colour mode (i.e. RGB if intended for online publication, or CMYK if intended for print).

The Benefits

Supplying diagrams, figures and supporting information in electronic form helps us reproduce your work with accuracy and clarity. It is far better to use an image from a high-quality electronic original than it is to scan a hardcopy print out, since quality is lost when scanning.

Electronic originals can also be re-arranged and relabelled far more effectively than a hardcopy print out can.

ELECTRONIC ARTWORK – SUBMISSION GUIDE

Please submit files in one of our preferred formats. We recommend the following standards:

EPS and PDF

- Embed fonts if possible, or convert to outlines.
- Do not define lines as 'hairline' width.
- The recommended minimum line weight is 0.3 pt for black lines on a light background, and 0.4 pt for white lines on a black background.
- For embedded images follow the guidelines for TIFF, below.
- Do not 'downsample' the quality of embedded images when creating a PDF.

TIFF

Resolution

- Grayscale or colour photographic images: 300 dpi (dots per inch) at the final output size.
- Monochrome artwork (black line art, white background): 600 dpi at the final output size.
- A combination image of photograph and labelling: 600 dpi at the final output size.

Compression

- TIFF files, especially those containing colour, can be very large; use LZW compression if possible, as this can greatly reduce the file size.

Colour

- Save black & white images as 'bitmaps' (1-bit mode) for monochrome, and in 'grayscale' (8-bit mode) for tones and combination tones.
- Supply colour images destined for print in CMYK mode.
- Supply colour images destined for online reproduction in RGB mode.
- Files should be free of colour functions, including PostScript colour management, transfer curves, halftone screen assignments and black generation functions. Files should not include references to ICC profiles.
- Total Area Coverage (TAC) for black or dark elements, or for black areas within colour images should not exceed 300%.
- For colour EPS and PDF images, black text and lines should be specified to overprint.

Good Practice

Crop or scale art to the size intended for publication; no enlargement or reduction should be necessary.

Remove excess space and elements from around the image. Type, lines or other elements not intended for publication should be removed before submission.

Make the image orientation the same as that intended for publication.

Flatten images prior to submission, i.e. they should not contain layers and/or transparent objects.

Creating EPS, PDF and TIFF

Most artwork packages can 'Save as...' or 'Export...' images as EPS, PDF or TIFF. This is preferable to saving in the native format of that program.

You can also create PDF files by using the full version of Adobe Acrobat or one of many alternative PDF creation programs available from the internet. Mac OS X also creates PDF files from any program using 'Print > Save as PDF'.

To create an EPS file you first have to install a PostScript printer driver (e.g. available from Adobe.com). You then choose 'Print to file' using the PS printer driver. The file you create is a valid PostScript file. This can be viewed in a PostScript viewer such as GhostView.



COMBINATION FIGURE 76.2 mm (3 in) wide at 300 dpi, 900 × 480 pixels. Labelling added in the PDF.

Image: A coastal gray wolf (*Canis lupus*), seen here on a September morning, 2003, at Yeo Island in the temperate rain forests of British Columbia's central coast.

From: *Journal of Biogeography*, www.blackwellpublishing.com/JBI
Photo: Chris Darimont.

Example

A photographic image that is three inches (76.2 mm) across at final size should be saved as TIFF with a width of 900 pixels (final size: 3 in; resolution: 300 dpi). An example of this is the wolf image (left).

A combination image of a photograph and labelling that is three inches across at final size should be saved as either (i) a TIFF with a width of 1800 pixels (final size: 3 in; resolution: 600 dpi), or (ii) an EPS containing an embedded TIFF at 900 pixels wide (final size: 3 in; resolution: 300 dpi), with labelling overlaid as a vector object (remember to embed fonts).

LOW RESOLUTION FIGURE Right, the same image at only 72 dpi, with labelling added in the TIFF – the resolution is too low and the image and text appear pixelated. Try zooming in on the image at 300% to see the effects of the low resolution in comparison to the 300 dpi image.



ELECTRONIC ARTWORK – FURTHER GUIDES

Storage Media and Compression

When sending electronic material it is best to use common formats, and compression methods that are widely available. Compressing large files allows quicker and more efficient transfer of files.

Media

Preferred: *Electronic graphics can be submitted via Manuscript Central (see the journal's Author Guidelines for instructions on submission). Alternatively electronic graphics can be sent on CD or DVD (PC format), or by FTP (see the specific journal instructions for the address and password)*

Compression

Preferred: *Zip (.zip), LZW compression in TIFF files*

In certain cases: gzip (.gz), tar (.tar), Stuffit (.sit)

Avoid: *.bin, .hqx, .rar, .sitx, and other uncommon, or very new, methods*

Supporting Information

We accept supporting information in many formats. Please provide as much information as you can about the file types, and aim for standard formats that will be viewable on many platforms (PC, Mac, UNIX, Linux). Irregular file types should be provided in a Zip archive.

Supplementary Material

Preferred: *GIF, JPEG, PDF, SVG, MPEG, AVI, MOV, MP3, plain text, RTF, Zip.*

Avoid: *EPS, application specific files.*

Creating EPS and PDF from Microsoft Office

Office documents are not ideal formats to create artwork in. We would rather that you use actual artwork and image manipulation programs. However, if you have used an Office format you can convert them to EPS or PDF in three main ways:

- (1) *Copy from the document and paste into a program such as Illustrator, Freehand or CorelDraw. Save the new file as an EPS.*
- (2) *Use Distiller or a PDF creation program to create a PDF of the file. Microsoft Word 2007 has 'Save as PDF' function. The PDF can be supplied to us. Check the settings to ensure that any fonts are embedded. Visually check that any embedded images are not downgraded in quality.*
- (3) *Print to file using a PostScript printer driver. This creates a PostScript file. On a PC it will probably give the file the extension '.prn' by default, but by using a PostScript printer driver you have indeed made a PS file. Change the extension to '.ps' or '.eps'; such files can be viewed with the free program GhostView.*

Digital Cameras

Modern digital cameras are able to take high-resolution images that are often suitable for print. We recommend that you use at least a 3-megapixel camera, as this provides an image at 2048 x 1472 pixels (173 mm x 125 mm in print). For cover images a high-quality 5-megapixel camera, or better, is recommended.

Unsuitability of JPEG and GIF for Print

While JPEG and GIF are good formats for images online, they are not ideal for print.

JPEG is a 'lossy' format, which means that it discards colour information. This is not normally an issue on a computer monitor, but is more noticeable in print. While a high-quality JPEG can be used (for example, where they are natively generated by your digital camera), TIFF is the preferred format for these types of image.

GIF has a lack of colour depth (it allows a maximum of only 256 colours, whereas CMYK/RGB allow millions) and so images may appear 'posterized' in print. While a high-resolution GIF can be used, TIFF is the preferred format for these types of image.

Software

Wiley have a webpage at <http://authorservices.wiley.com/bauthor/software.asp> providing links to useful software. Generally the industry standard programs for electronic artwork are Adobe's Photoshop, Illustrator and Acrobat (<http://www.adobe.com>). There are good alternatives provided by Corel (<http://www.corel.com>) and Macromedia (<http://www.macromedia.com>). For viewing PostScript files we recommend GhostView and GhostScript (<http://www.cs.wisc.edu/~ghost/>).

Further Reading

There are many online resources available that cover electronic artwork and the formats discussed in some detail (do an internet search for 'electronic+art+tutorial' for instance). Programs such as Adobe Photoshop and Adobe Illustrator also have web tutorials dedicated to them on sites such as About.com (<http://graphicssoft.about.com/>). Adobe discuss their PostScript language and PDF format in some detail on their website (<http://www.adobe.com/products/postscript/>).

ELECTRONIC ARTWORK – GLOSSARY

A list of useful definitions for some common terms in electronic artwork

Acceptable formats Our preferred formats for electronic artwork are:

- **EPS** or **PDF** for line art or **combination images**
- **TIFF** at a resolution of **300 dpi** for **photographic images**

We can also accept JPEG, GIF and Microsoft Office formats if this is all that can be supplied. But in these cases we cannot be certain that we will be able to use them, or that they will be of usable quality.

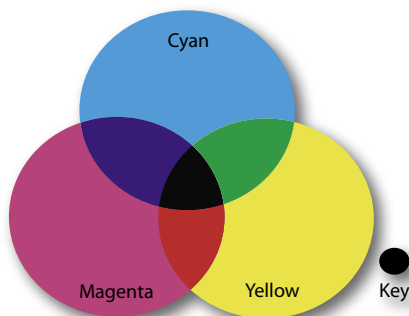
Acceptable resolutions The resolutions we recommend are as follows:

- **Photographic** (or '**halftone**') images should be at a resolution of **300 dpi** at final size (whether a complete image or embedded in a combination figure)
- **Line art** or combination images should be saved at a resolution of **600 dpi** when saved as a raster image, although **EPS** or **PDF** is preferred

Bitmap An image stored in a pixel-by-pixel fashion. Continuous tone images are stored in this format. Sometimes used to denote an image composed solely of black and white, in which each pixel is either on or off (each pixel being represented by 0 or 1, in computer terms a bit).

BMP Windows bitmap. A common form of bitmap file in Microsoft Windows. Poorly supported by other operating systems and with limited support for colour. Should be avoided for print and web. PC suffix .bmp

CMYK Cyan, magenta, yellow, black (key). A colour model used to represent colour in print. Known as subtractive colour model. Colour is reproduced by the absorption of light by pigments. Although the full colour gamut can be represented in CMY, true black cannot be made owing to impurities in the actual inks. Black (K) is added to counter this.



CMYK Subtractive colour mixing of cyan, magenta, yellow and black (key) in the CMYK colour mode.

Combination figure/image Artwork that contains both vector/text and continuous tone elements, e.g. an annotated photograph.

Compression Making an image or file size smaller using a computer program or numerical method, e.g. Zipping a file or using LZW compression. Zip files can be 'extracted' again, so no data is lost in the compression, whereas JPEG compression discards information which cannot be recovered (see 'lossy' below).



GIF Continuous tone GIF showing the limitations of only 256 colours.

Compuserve GIF Graphical interchange format, not suitable for print. A compressed file format that uses run-length encoding (LZW) to make smaller files. This type of compression is only useful for images with flat areas of colours and can only store up to 256 colours/grays. It is a very useful format for the web but with its very limited range of colours should not be used for print. PC suffix .gif

Continuous tone An image composed of a range of tones, e.g. a photograph. These images cannot be described mathematically and are instead described pixel-by-pixel in a bitmap. TIFF is an example of a bitmap format.

Digital camera Digital cameras are capable of creating high-quality original electronic images. We recommend using a good quality camera with a resolution of greater than 3 megapixels, and ideally greater than 5 megapixels. Please save the image

ELECTRONIC ARTWORK – GLOSSARY (CONTINUED)

as a TIFF or JPEG at the highest quality setting, and avoid the RAW format.

Dot gain On printing, halftone ink dots spread on the paper causing colours that are too dark or strong.

Downsampling The removal of pixel data from an image to save file size in exchange for less detail, e.g. when embedded images are optimized for web display and desktop printing.

DPI Dots per inch. The unit of measurement for output resolution of a printed image. Often used to mean 'pixels per inch' to describe the resolution of an image. Requirements: 300 dpi for halftone images, 600 dpi for line art and combination figures.

Encapsulated PostScript (EPS) PostScript is a page description language developed by Adobe. It encodes vector artwork as a series of mathematic descriptions, allowing vector artwork and text to be stored and resized irrespective of resolution. Bitmaps can also be embedded in PostScript files, making this a useful format for both line art and combination figures. EPS files can be placed in larger PostScript publications. We recommend this format for vector and combination of vector and bitmapped images. PC suffix .eps.

Filenaming convention A logical approach to filenaming. We suggest that filenames combine a manuscript identification number, the figure number and part, and a suffix representing the filetype, eg:

<author name>_<figure number>.<suffix>

So "darimont_f1a.eps" would be Figure 1, part (a) accompanying manuscript by Darimont. Manuscript numbers are often assigned by editorial offices. Try to avoid generic names like Fig1.eps. It's recommended that you use the underscore (_) character rather than a space () or full stop (.) as a divider in filenames as it avoids problems in different filenaming systems.

Fonts See Standard fonts.

FTP File Transfer Protocol. A method for transferring files over the Internet. FTP details for specific journals are available in the journal's Author Guidelines.

GIF See Compuserve GIF.

Grayscale/Greyscale An image composed of black, white and intermediate shades of gray. Although grayscale can be represented in colour, file sizes are larger as a result of unused data. There are normally 256 shades of gray in a grayscale image.

Halftone A method of reproducing continuous tone artwork in print by screening an image to break it down into a series of dots of varying size (which can be reproduced by spots of ink). The size of each dot represents the ink density. Colour halftones are reproduced as a series of CMYK dots laid down in rosette patterns. Halftones are used as printing presses cannot manage the hundreds (or millions) of inks that would otherwise be required for continuous tone.

JPEG A type of compressed file (strictly a type of compression) particularly suited for storing continuous tone bitmap data (such as photographs), not suitable for print. It achieves a high level of compression by discarding some of the data in an image. JPEG compression can result in artefacts such as areas of blocky appearance and auras around sharp edges and text. Consequently it should not be used for print but is particularly suited to the web. PC suffix .jpg/.jpe/.jpeg

Line art Any image composed of lines and text, such as graphs, charts and illustrations. Best saved in vector formats (such as EPS).

'Lossy' Any type of compression that discards portions of data in order to reduce the file size, e.g. JPEG.

LZW Lempel, Ziv, Welch compression. A form of run-length encoding that compresses some bitmap images. Compression is carried out by an algorithm that looks for areas of a single colour or patterns and replaces the repeating pixel data with the equivalent of 'the next x pixels are...'. Of little use for compressing continuous tone bitmaps and may in fact enlarge them, but effective on monochrome images with repeating patterns.

Monochrome A 1-bit black and white image saved as bitmap mode.

PDF Portable document format. A derivative of PostScript, also able to store both vector and bitmap data. Whilst this format can be used for encoding individual images, it is more often used to store documents in a 'print on screen' format that can be viewed with Adobe's free Acrobat reader software on a wide range of computer operating systems. PC suffix .pdf

PICT A primarily Macintosh format, often used for graphic file interchange between Macintosh applications but less support

ELECTRONIC ARTWORK – GLOSSARY (CONTINUED)

exists on other systems. PC suffix .pic/ .pict

Pixel Picture element. Each pixel is given a position and colour value. A grid of pixels makes up a bitmap image.

PostScript PostScript printer drivers can be used for the creation of EPS files. Images can be selected and the 'Print' option used to select the PostScript 'printer' to produce an EPS file on disk. See the Adobe website for details of PostScript printer drivers at <http://www.adobe.com/support/products/printerdrivers.html>

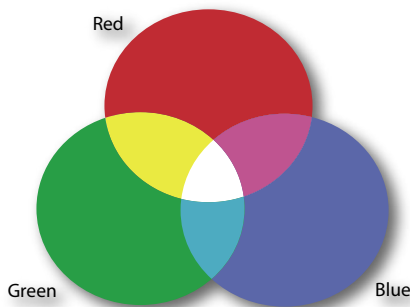
PPD PostScript Printer Description. A file that contains printer specific information for PostScript printer drivers. Required when installing a PostScript driver, even when you do not have a printer.

Raster image Also sometimes called a bitmap, an image made up of a grid of pixels.

Resolution See DPI.

RAW format This is a format that digital cameras can save in. This is to be avoided. We prefer TIFF (or JPEG at the highest quality setting if this is the only output option for your camera).

RGB Red, green, blue. A colour model used to represent colour on screen. Known as an additive colour model. Colours are reproduced by light emitted directly from an object.



RGB Additive colour mixing of red, green and blue in the RGB colour model.

Standard fonts Common fonts that are available and easily substituted for in all computer operating systems. For maximum clarity we recommend you use sans serif fonts (Arial/Helvetica) for labelling figures, and Symbol for Greek and other characters. Unusual fonts may not be supported on all systems and may be lost on conversion.

TAC Total Area Coverage. This is the total combined value of CMYK for the darkest area of an image. The upper limit is often specified as 300% for CMYK process printing.

TIFF Tagged Image Format File. A widely supported standard for saving bitmap images (continuous tone). It can store images in colour (RGB or CMYK) and greyscale and supports LZW compression. A recommended format for storing continuous tone images. Line art must be saved as high resolution TIFF (600 dpi). PC suffix .tif

Vector art An image that can be described mathematically as a series of coordinates, lines and shapes. EPS is an example of a vector format. Vector artwork may include text, graphs or illustrations.

Web optimization A process where press-quality images are reduced in resolution so that the overall size of a PDF or image is smaller. This makes them appropriate for viewing on screen and for desktop printing, and easier to download via the web. Files destined for high-end print publication should not be web optimized.

WMF Windows metafile. A Microsoft Windows format, usually used for interchange of image data between Windows software, and rarely used as an end format. PC suffix .wmf

Zip Another derivative of the LZW compression. Commonly used for compressing and archiving files in Microsoft Windows environments. Zip files can be 'extracted' again, so no data is lost in the compression.

ELECTRONIC ARTWORK – FAQ

Should I send my figures electronically?

Yes. We prefer to use your electronic figures, rather than work from a hard copy. If you have used a computer to create your figures then please include these files in your submission. It gives you the opportunity to see your own work in print as you intended it to appear. It also helps prevent errors and enables us to reduce the time it takes to publish your paper.

How do I save an electronic version of a photographic image?

Digital images (either directly from a digital camera or other imaging device or from scanned photographs) should be saved as a Tagged Image Format File (TIFF). You should save the image at the size you intend it to be reproduced and ensure that the image is of sufficient resolution. The resolution of a computer monitor is 72–96 dpi and while an image may look perfect on screen it is often of insufficient resolution for print. For adequate reproduction, files should be saved at 300 dpi (bear in mind that if you subsequently change the size of a digital image you will also change the resolution). Note that increasing the resolution beyond that of the original image cannot improve its quality and will just produce very large files.

I've saved my image as a TIFF but the file is very large

Unfortunately, photographic images often produce very large files. The TIFF file can be 'zipped', producing a much smaller ZIP file from which the TIFF can later be extracted for use. Alternatively, most software has an option to compress the file using LZW compression – this will produce smaller files, especially when the image contains large areas of single colour or repeating textures and patterns. If the image is black & white, check that the colour is set to grayscale – saving black & white images as RGB or CMYK stores unnecessary additional information and increases the file size.

I've compressed my TIFF image but it is still too large to send by email

Large files can be sent over the internet via File Transfer Protocol (FTP). If you are unable to send the file by FTP, they can be saved to CD, DVD or Zip disk and sent by mail.

Do I need to do anything differently for colour images?

Both black & white and colour photographic images should be saved at the same 300 dpi resolution at the final reproduction size. Combination or line art should be saved as EPS or PDF, or at 600 dpi resolution if in TIFF format. Colour images intended for print publication should be saved as CMYK and not as RGB. RGB images represent colours as seen on screen, whereas CMYK produces a more accurate representation of printed colour. Care should be taken with colour images as RGB and CMYK colour ranges are not equal and CMYK colours may appear muted in print in comparison to the onscreen RGB. Colour proofs should be checked closely. Black & white images should be saved as grayscale.

Why should I not save my images as a JPEG or GIF?

These are attractive formats as they result in much smaller files than TIFF. Unfortunately, there are several good reasons why you should not use them for print. The 'lossy' compression process used by JPEG discards some of the data in your image resulting in a reduction in image quality. GIF files use a similar compression process to LZW-TIFF available in many software applications, however, this format only supports 256 colours/shades of gray, often significantly reducing the quality of your figures. These formats should be reserved for images to be viewed on screen.

How should I save images from a digital camera?

The options for saving images will differ depending on the camera you are using. If your camera supports the TIFF format, then this is the best to use. Otherwise, choose a high resolution JPEG format with very light compression. The RAW format can be of high quality, but is difficult to work with and should be avoided.

How do I save an electronic version of my graphs and illustrations?

Line art is best saved as Encapsulated PostScript (EPS) files. These are usually far more compact than TIFF and are easily editable and independent of resolution. Illustration software and many other packages will allow you to 'Save As' or 'Export' your line art directly as an EPS or PDF file.

The software I am using for my graphs and illustrations doesn't have an option to produce EPS files – how should I create these?

You can still save your image as an EPS file using a PostScript printer driver which can be freely obtained and installed in a few minutes (you do not need a PostScript printer). With a PostScript printer driver installed, images can be selected and the 'Print' option used to select the PostScript 'printer' to produce an EPS file on disk. With multi-page documents, care should be taken to save each figure separately, by ticking either the 'Selection', 'Current Page' or 'Current Slide' in the 'Print' dialogue.

Can I use PowerPoint or Excel?

Excel can be used to prepare graphs and the EPS files can be produced using the 'Print' option outlined above. PowerPoint should be used with caution as this application is intended for producing visual presentations rather than print output, but with care can produce quality artwork. Line art can be saved as EPS, again using the Print option. Microsoft Word 2007 has a 'Save as PDF' function, for easy creation of PDFs. If you are unable to convert the file to EPS or PDF then please send the

ELECTRONIC ARTWORK – FAQ (CONTINUED)

original .ppt or .xls file to the Production Editor of the journal, who will be able to process these accordingly.

Are there any tips for producing good EPS output?

Keeping an image simple is the best way to produce good output. Try to avoid adding more to your graph or illustration than is necessary. Avoid 3D charts, excessive shading, stipples, lines and symbols (if there are several symbols, try and add them to the legend rather than a key). Size your figure correctly, resizing can often cause problems, and use a standard font – Arial and Helvetica are recommended (sans serif fonts are usually used on figures to help distinguish labels from surrounding text). Line thickness in graph axes etc. should be greater than 0.3 pt. When using shades of gray or other tints, be wary of using shades too close together – an ideal separation is 20%.

My figure contains both text/lines and photographic images – how do I save an electronic version?

Combination figures of this sort should preferably be in EPS format. Photographic images (saved at the correct size and 300 dpi resolution) can be imported into illustration software for labelling and saved as an EPS file. This often produces a smaller file than the equivalent TIFF, and any lettering, labels and line art will appear at optimum quality in print. If using TIFF for images with lettering, the image should be saved at a higher resolution than a photographic image alone in order to avoid the text and line art appearing jagged – 600 dpi resolution should be used for both black & white and colour.

How do I view an EPS file that I have created?

Native EPS files cannot easily be viewed on screen. If you have access to a PostScript printer, these files can be printed directly. Another option is to create a PDF file using Adobe Distiller or similar software. The free Acrobat Reader viewer will allow you to view and print PDF files. A program called GhostScript is freely available on the internet for PC, Apple Macintosh and UNIX/Linux systems, and will also allow you to preview and print EPS images.

When I import an EPS file into another application why does the quality appear very poor?

Because you cannot easily view an EPS image, some software adds a preview image to the file (you may have seen options for this if using the 'Save As' and 'Export' options). This is a low-resolution preview and not the actual image. Printing this on a non-PostScript printer will also result in the preview being printed, but a PostScript printer will print the correct image, and we will use the correct image in the production of the published article.

How do I install a PostScript printer driver?

Please see the advice from Adobe, the creator of PostScript, at <http://www.adobe.com/support/products/printerdrivers.html>

Can I send figures as PDF files?

Yes. Creating PDF files is easier than ever these days and they can be an excellent way for you to provide your figures in electronic format. However, you must be careful to ensure that any embedded images are of high quality and have not been downsampled in the creation of the PDF.

To check the quality of the embedded images you should zoom in on the PDF to a magnification of 400%. This allows you to visually check the quality of the images.

You can try this on these guides by inspecting the 300 dpi and 72 dpi versions of the wolf image. On screen at 100% both seem of comparable quality but closer inspection at 400% magnification reveals noticeable artefacts in the 72 dpi version, which appears more 'pixelated' than the high resolution version.

The other advantage of PDFs is that they can be easily created from any application on your computer. Although Adobe Acrobat is the most common and best PDF creation software, there are a number of alternatives that can be found on the internet.

Why EPS not recommended for Supporting Information?

EPS is an excellent format for our typesetters to use. However, for readers of the online journals this format may be difficult to view and print. Therefore it is useful for readers if supplementary figures are supplied as PDFs or in an image format such as TIFF, JPEG, etc.

ELECTRONIC ARTWORK – BRIEFING DOCUMENT FOR EDITORS

What are the preferred formats?

We prefer to receive images in industry standard formats used in the typesetting environment, which are required for high-quality printing. Anything that is not submitted in these formats has to be converted, and any conversion process risks introducing errors.

Artwork supplied in the following formats are likely to produce the best quality images in print, online and in PDF proofs and offprints. In addition, if supplied in these standard formats, authors will know exactly how their artwork will appear in the final product.

The preferred formats are:

- **EPS or PDF for line art or combination images** of photographs and labelling/lines
- **TIFF at a resolution of 300 dpi for photographic (or 'halftone') images and 600 dpi for line art or combination images**

Lower quality images will lead to blurry or pixelated reproduction in print and online.

Which formats are acceptable?

TIFF, EPS and PDF are our preferred formats, but the following formats are also sometimes acceptable for our journals: JPG, GIF, Word, Excel and Powerpoint. Check with the Production Editor to determine what is appropriate for a particular journal: in general, a journal where the quality of the artwork is critical, where there is a large volume of artwork, or where the production time is very short needs to be more rigorous about the format of artwork accepted.

It is important to understand that the non-preferred formats are not ideally suited to high-quality image reproduction (JPG and GIF files have built-in compression to reduce the file sizes for web products; Microsoft Office software is not intended for high-quality output, Powerpoint in particular tries to force images to have properties appropriate for screen viewing because it is a presentation program) and that the final published quality may not be ideal. In short, send in a preferred format if at all possible.

How do I view TIFF, EPS and PDF files?

There are plenty of free or low-price programs for viewing these types of files:

- *Kodak Imaging for Windows and Preview (for Mac) are available to view TIFF files*
- *GhostView is available free of charge to view EPS files*
- *Adobe Acrobat Reader is available free to download to view PDF files*

One query that is often raised is why some files look fine on screen but awful when printed. This is a result of screen resolution (only 72 dpi) being much lower than that of a printing press.

How do we increase the number of high-quality electronic images received?

- *Specify what is required in the Instructions to Authors/Submission Guidelines: include a link to the Wiley Electronic Artwork Submission site.*
- *If low-quality figures are used for peer-review purposes ensure that on acceptance, authors are instructed to provide high-quality images for publication.*

The benefits of supplying electronic artwork

We would very much like to receive as much artwork as possible electronically for our journals because there are a number of clear advantages over using hard copy artwork:

- *Electronic originals can be re-arranged and relabelled to the required journal style far more easily than a hardcopy print out can.*
- *Supplying high-quality electronic artwork can reduce delays in production time, as it minimizes the need to go back to authors to resupply artwork and the need for posting hard copy materials.*
- *Using a high-quality electronic image rather than scanning from hard copy will nearly always produce a better quality image both in print and online because quality is always lost when scanning.*