BLACKWELL PUBLISHING'S ELECTRONIC ARTWORK GUIDES

Our series of guides introduces you to electronic artwork.

The following guides listed to the right are available.

ELECTRONIC ART GUIDES

ELECTRONIC ART – AN INTRODUCTION
Introduces our preferred formats, colour modes, good practice and the benefits of electronic artwork.

ELECTRONIC ART – SUBMISSION GUIDES
Gives technical specifications for the submission of artwork in TIFF, EPS and PDF format. Also gives advice on good practice and creating TIFF, EPS and PDF files.

ELECTRONIC ART – FURTHER GUIDES
Covers storage media and compression methods, supplementary material, Microsoft Office formats, digital cameras, JPEG and GIF formats and a mention of suitable software. Also gives some advice on further reading.

ELECTRONIC ART – BRIEFING DOCUMENT
An overview document that is useful for giving a summary of the formats and listing the benefits of electronic artwork. Intended for journal editors and publishers, but useful to others too. Also includes a note on preferred and acceptable formats.

ELECTRONIC ART – GLOSSARY
A three-page glossary listing terms used in these guides and in discussing electronic artwork in general. Arranged alphabetically from *Acceptable formats* to *Zip*.

ELECTRONIC ART – FAQ
A three-page list of frequently asked questions, and answers to them, about manuscript submission and electronic artwork.

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TIFF EXAMPLE
76.2 mm (3 in) wide at 300 dpi
900 × 480 pixels

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.**

Below, the same image at only 72 dpi – the resolution is too low.

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ELECTRONIC ART – 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 art that mirror the standards of the publishing industry.

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'.
File extension: .tif
Recommended for: photographic images

EPS (Encapsulated PostScript) – This keeps text and lines sharp at all sizes. It can also contain photographic images. Please make sure that any embedded images are of high resolution and ideally are 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. 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

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 will 'Save' or 'Export' files as TIFF or EPS, and you can create EPS or PDF from any program using a PostScript printer driver or PDF creation software, which is becoming increasingly common.

Colour Modes – Monochrome, Grayscale, RGB (online) and CMYK (print)
Monochrome art (black on white) should be in 'bitmap' mode (also called 1-bit).
Greyscale 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 – 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 readable 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 (try zooming in on the wolf images to the left).
Please use standard formats, and don't supply files in a format native to a particular program or operating system. See the *Further Guides* PDF 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 supplementary material 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 on scanning.
Electronic originals can also be re-arranged and relabelled easier than a hardcopy print out.

ELECTRONIC ART – SUBMISSION GUIDES

Wolf Image

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.

Below, the same image at only 72 dpi – the resolution is too low. Labelling added in the TIFF.

Wolf Image

Guidelines for Submission
Please submit files in one of our preferred formats. We recommend the following standards.

TIFF
Resolution
• *Greyscale or colour **photographic images: 300 dpi** (dots per inch).*
• ***Monochrome artwork** (black line art, white background): **600 dpi**.*
• *A **combination image** of photograph and labelling: **600 dpi**.*
Compression
• *TIFF files, especially those containing colour, can be very large; use **LZW compression** if possible, as this can greatly reduce the file size.*

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.*
• *Do not 'downsample' the quality of embedded images when creating a PDF.*

Colour
• *Save black and 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 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 TIFF, EPS and PDF
Most artwork packages can 'Save as...' or 'Export...' images as TIFF, EPS or PDF. 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.

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).

Image from: *Journal of Biogeography*. Photo: Chris Darimont.

FURTHER READING
There are many online resources available that cover electronic art and the formats discussed in some detail (use an internet search engine 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 discusses their PostScript language and PDF format in some detail on their website (http://www.adobe.com/products/postscript/).

Image from: *Journal of Biogeography*.
www.blackwellpublishing.com/JBI
Photo: Chris Darimont.

ELECTRONIC ART – 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: CD (PC format), FTP (see the specific journal instructions for the address and password), MS-DOS floppy disk, Zip 100 or 250 disks
Avoid: DVD (use CD instead), Jaz Drives, MO disks, larger Zip disks (e.g. 750 MB), strangely shaped CDs or CDs that are too small for slot-loading drives

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

Supplementary Material
We accept supplementary material 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.
Preferred: GIF, JPEG, PDF, SVG, MPEG, AVI, MOV, MP3, plain text, RTF, Zip.
Avoid: EPS, application specific files.

Office Formats: Creating EPS and PDF
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. The PDF can be supplied to us. 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 loses 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, 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
Blackwell have a webpage that links to useful software, which is updated periodically. Generally the industry standard programs for electronic art 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/).

How can we accept electronic images?
We can accept electronic images on
CD, Zip disk, and by FTP.

Although small files can be sent by
email, many larger files will not be
able to be sent by this method so the
former methods may be preferable on
a routine basis.

Image from: *Journal of Biogeography.*
www.blackwellpublishing.com/JBI
Photo: Chris Darimont.

ELECTRONIC ART – BRIEFING DOCUMENT

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 these following formats are likely to produce the best quality images in print, online and on 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 *300 dpi* for *photographic images* and at *600 dpi* for *line art* or *combination images*

Lower quality images will lead to blurry 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 do some files look fine on screen but awful when printed. This is a result of screen resolution 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 Instruction to Authors/Submission Guidelines: include a link to the Blackwell 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.

- ☑ *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 on scanning.*
- ☑ *Electronic originals can be re-arranged and relabelled to the journal style required far easier 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.*

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Subtractive colour mixing of cyan, magenta, yellow and black in the CMYK colour model.
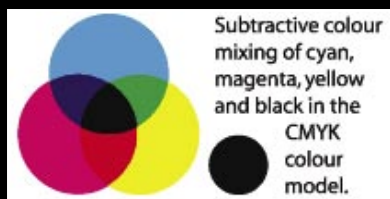
CMYK Cyan, magenta, yellow and black

ELECTRONIC ART – GLOSSARY

Acceptable formats Our preferred formats for electronic art are

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

We can also accept JPEG, GIF and 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 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 **600 dpi**.

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. A colour model used to represent colour in print. Known as subtractive colour model. Colour is reproduced by the reflection of light off 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.

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.

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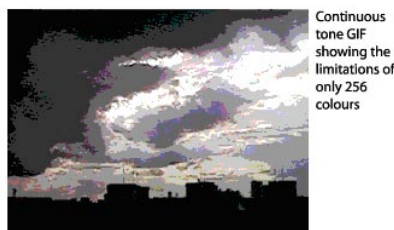
Continuous tone GIF showing the limitations of only 256 colours

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 originalelectronic 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 as a TIFF and avoid the RAW format.

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

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Downsampling The removal of pixel data from an image to save file size in exchange for less detail, e.g. when embedded images are lowered in quality when making a PDF for the web.

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.

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.

GIF See Compuserve GIF.

Grayscale/Greyscale An image composed of black, white and intermediate shades of grey. Although greyscale can be represented in colour, file sizes are larger as a result of unused data. There are normally 256 shades of grey in a greyscale 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 print the fine graduations of ink 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 should not be used for print but is particular 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 loses portions of data to lower 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.

GLOSSARY – *continued*

RGB Red, green and blue

Standard fonts

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 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.

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.

RAW format This is a format that digital cameras can save in. This is to be avoided. We prefer TIFF.

RGB Red, green, blue. A colour model used to represent colour on screen. Known as an additive colour model. Colours are reproduced by additive amounts of light passing through a range of pigments.

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. It is often specified as 300% for CMYK process printing.

TIFF Tagged image format files. 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 images are lowered in quality so that the overall size of a PDF or image is smaller. This makes them appropriate for viewing on screen and easier to download via the web. Files destined for 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.

ELECTRONIC ART – FAQ

Questions About Manuscripts

How do I submit my manuscript?

Blackwell Publishing can accept almost all disk formats, including 1.44 Mb floppy disks, Zip disks, CD-R and CD-RW, and FTP. Files should be named informatively, where possible using the reference number given to you by the editorial office. Remember to fill in the disk submission form (available from the editorial office) and to check that the version of the file on the disk is the same as the final accepted typescript. See the *Further Guides* PDF for suitable media.

Can I use any word processor to prepare my manuscript?

Yes.

What recommendations are there for producing my electronic document?

Try and avoid excessive formatting. Lay out your text so that the headings and sections are clearly defined. Where several levels of headings are required, ensure each is clearly styled. Use a standard font for your text, Times New Roman/Times and Arial/Helvetica are recommended. Use the Symbol font for symbols and Greek characters. Always submit a hard copy of each figure so we have something with which to compare the electronic files.

What should I do with tables?

Include these at the end of your manuscript. Where available use the table function in your software. Place each table item in its own cell. Avoid using the return key to format or to add spacing to the table.

Questions About Figures

What should I do with figures?

We can use your electronic figures. 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 dots per inch (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). Do not use higher resolutions, these will not improve the quality of your image but will 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. 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.

I've compressed my TIFF image but it is still too large to save on a floppy disk

Other forms of storage media may suffice. ZIP disks will hold at least 100 Mb of data and recordable CD-R 650 Mb. Compressing the files into Zip and Stuffit archives will not reduce file sizes further. Sending files via File Transfer Protocol (FTP) is another option for users with a permanent connection to the Internet.

Do I need to do anything different with colour images?

Both black & white and colour images should be saved at the same 300 dpi resolution at the reproduction size. 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. Colour proofs should be checked closely. Black & white images should be saved as grayscale.

Why shouldn't I 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 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 grey, 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?

Depending on the camera you are using, the options for saving images will differ. 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 file.

The software I am using for my graphs and illustrations doesn't have an option to produce EPS files

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.

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 grey 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?

You can save this as either a TIFF or EPS image. TIFF images with lettering should be saved at a higher resolution than a photographic image alone to avoid the text and line art appearing jagged – 600 dpi is a recommended resolution for both black & white and colour. A more convenient option and preferable option is EPS. 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 and any lettering, labels and line art will not appear jagged in print.

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 portable document format (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.

I've imported an EPS file into another application and the quality is 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.

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 reveals that the 300 dpi version is far superior.

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 isn't EPS recommended for Supplementary Material?

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.