

Reporting information about bioacoustic recordings, spectrograms, and measurements

Always be sure to state:

Recording

- Sample rate (e.g., 44.1, 48, or 96 kHz) and bit depth (typically 16 or 24 bits) of the recording;

Spectrograms

- Window function and length (expressed both in samples and time), 3 dB filter bandwidth;
- Window overlap and resulting hop size or time measurement precision, in ms;
- DFT size in samples and frequency measurement precision (Raven's "frequency grid spacing), in Hz;

Example:

"Signals were recorded at a sample rate of 44.1 kHz and a sample size of 16 bits. Spectrograms were made with a 512-point (11.6 ms) Hann window (3 dB bandwidth = 124 Hz), with 75% overlap, and a 1024-point DFT, yielding time and frequency measurement precision of 2.9 ms and 43 Hz."

(Items in blue are commonly reported; reporting all of the values shown here is preferable.)

Sound level measurements

- For measurements of sound pressure levels, always state the reference pressure; standards are 20 μPa for measurements in air and 1 μPa for measurements in water.
- For measurements of sound pressure from a particular source (e.g., an individual animal or a specific anthropogenic source), always state the distance from the source to the microphone.
- For measurements from a sound level meter, always state the weighting curve (typically either A or Z) used for the measurements. A-weighting is the default on many devices but should be avoided (in favor of Z-weighting or "flat" response) unless your measurements are intended to represent how sounds are perceived by humans.
- If you report averages of measurements in dB, remember that a simple average of dB values will yield erroneous results. You need to convert from dB to linear pressure units (i.e., μPa), average those, then convert back to dB. (See the decibel Powerpoint slides for details.)