

APPENDIX B. *Symbols, Abbreviations, and Acronyms*

1. *Standard symbols, abbreviations, and acronyms*

The following symbols, abbreviations, and acronyms, along with others that are approved for the *Système International d'Unités* (SI) or that appear in *Webster's Third New International Dictionary* or the current edition of *Merriam-Webster's Collegiate Dictionary*, may be used without definition. Note, however, (1) that English units may only be used in two AFS journals—the *North American Journal of Aquaculture* and the *North American Journal of Fisheries Management*—and (2) that additional symbols, abbreviations, and acronyms may be approved for use without definition in specific AFS books (check with the books editor for such terms).

Prefixes

| | |
|---------------------|-------|
| giga (10^9) | G |
| mega (10^6) | M |
| kilo (10^3) | k |
| milli (10^{-3}) | m |
| micro (10^{-6}) | μ |
| nano (10^{-9}) | n |
| pico (10^{-12}) | p |

Time and Temperature

| | |
|--|-----|
| day | d |
| hour | h |
| minute | min |
| second | s |
| degrees Celsius ($[\text{°F} - 32]/1.8$) | °C |
| degrees Fahrenheit ($[1.8 \times \text{°C}] + 32$) | °F |

(Spell out year, month, and week.)

Weights and Measures (Metric)

| | |
|---|------|
| catch per unit effort (define mathematically, e.g., number/net-night) | CPUE |
| centimeter | cm |

| | |
|-----------------------------------|-----|
| meter (1.09 yd, 3.28 ft, 39.4 in) | m |
| kilometer (0.622 mi) | km |
| gram (0.0353 oz) | g |
| kilogram (2.20 lb) | kg |
| liter (0.264 gal, 1.06 qt) | L |
| deciliter | dL |
| hectare (2.47 acres) | ha |
| nephelometric turbidity units | NTU |
| practical salinity units | psu |
| fork length | FL |
| standard length | SL |
| total length | TL |

(Spell out metric ton [1,000 kg {2,200 lb}].)

Weights and Measures (English)

| | |
|--|--------------------|
| inch (2.54 cm) | in |
| foot (30.5 cm) | ft |
| cubic feet per second (0.0283 m ³ /s) | ft ³ /s |
| yard (0.914 m, 91.4 cm) | yd |
| mile (1.61 km) | mi |
| ounce (28.4 g) | oz |
| pound (0.454 kg, 454 g) | lb |
| quart (0.946 L) | qt |
| gallon (3.79 L) | gal |

(Spell out acre [0.405 ha] and ton [2,000 lb or 907 kg])

Mathematics and Statistics

| | |
|---|----------------------------|
| analysis of variance | ANOVA |
| analysis of covariance | ANCOVA |
| base of natural logarithms | <i>e</i> |
| coefficient of variation (define mathematically, e.g., 100 · SD/mean) | CV |
| common test statistics | <i>F</i> , <i>t</i> , etc. |
| confidence interval | CI |
| correlation or regression coefficient | |
| multiple | <i>R</i> |
| simple | <i>r</i> |
| covariance | cov |

| | |
|--|------------------------|
| degree (angular) | ° |
| degrees of freedom | df |
| expected value | E |
| logarithm | |
| natural | \log_e or \ln |
| base a | \log_a |
| minute (angular) | ' |
| not significant | NS |
| percent | % |
| probability | P |
| probability of type I error (false rejection of null hypothesis) | P_α or α |
| probability of type II error (false acceptance of null hypothesis) | β |
| radian | rad |
| sample size | N or n |
| second (angular) | " |
| standard deviation | SD |
| standard error | SE |
| steradian | sr |
| variance | |
| population | V or Var |
| sample | var |

Physics and Chemistry

| | |
|---------------------------------|-----------------------|
| all atomic symbols | H, He, etc. |
| alternating current | AC |
| ampere | A |
| base pairs | bp |
| becquerel | Bq |
| calorie (joule preferred) | cal |
| candela | cd |
| chemical acronyms in dictionary | DDT, EDTA, etc. |
| coulomb | C |
| deoxynucleotide triphosphate | dNTP |
| dextro configuration | D |
| dextrorotary | d |
| direct current | DC |
| electron volt | eV |
| equivalent | eq |
| farad | F |
| footcandle (0.0929 lx) | fc |

| | |
|---|----------|
| gravity | <i>g</i> |
| gray | Gy |
| hertz | Hz |
| horsepower (746 W) | hp |
| hydrogen ion activity (negative log) | pH |
| joule | J |
| levo configuration | L |
| levorotary | <i>l</i> |
| lumen | lm |
| lux | lx |
| molar | M |
| mole | mol |
| newton | N |
| normal | N |
| ohm | Ω |
| ortho | <i>o</i> |
| para | <i>p</i> |
| parts per million (in the metric system, use mg/L, mg/kg, etc.) | ppm |
| parts per thousand | ppt, ‰ |
| pascal | Pa |
| passive integrated transponder | PIT |
| polymerase chain reaction | PCR |
| polyvinyl chloride | PVC |
| siemens (= mho, Ω^{-1}) | S |
| tesla | T |
| tris(hydroxymethyl)-aminomethane | tris |
| volt | V |
| watt | W |
| weber | Wb |

General

| | |
|---|-------|
| American Type Culture Collection | ATCC |
| colony-forming units | CFU |
| compass directions (maps and coordinates) | |
| east | E |
| north | N |
| south | S |
| west | W |
| corporate designations | |
| Company | Co. |
| Corporation | Corp. |
| Incorporated | Inc. |
| Limited | Ltd. |

| | |
|-------------------------------------|------------------------|
| District of Columbia | D.C. |
| et alii | et al. |
| et cetera | etc. |
| filial generation | F |
| for example | e.g., |
| geographical information system(s) | GIS |
| Global Positioning System | GPS |
| international units | IU |
| months in tables and figures | Jan, Feb, Mar, etc. |
| plaque-forming units | PFU |
| ploidy | n |
| sex in tables, figures, and hybrids | |
| female | ♀ |
| male | ♂ |
| that is | i.e., |
| units | U |
| United Kingdom | UK |
| United States | |
| noun | USA |
| adjective | U.S. |

2. Other symbols, abbreviations, and acronyms

The following symbols, abbreviations, and acronyms are also commonly used in AFS publications. Unlike those in section 1, however, they must be spelled out in full at first use. Alternatives may also be used as long as they are defined.

| | |
|--------|---|
| Ab | antibody |
| ARMA | autoregressive–moving average |
| BCWD | bacterial coldwater disease |
| BHI(A) | brain–heart infusion (agar) |
| BKD | bacterial kidney disease |
| BOD | biological (<i>or</i> biochemical) oxygen demand |
| BP | before present (radiocarbon dating; 1950 = present) |
| BSA | bovine serum albumin |
| CCL | certified cell line (ATCC designation) |
| CCV | Channel Catfish virus |

| | |
|-----------|--|
| cdf | cumulative density function (<i>cf.</i> pdf) |
| CHH | Chum Salmon heart (a cell line) |
| CHSE | Chinook Salmon embryo (a cell line) |
| CL | (1) certified cell line (variant of CCL); (2) confidence limit |
| CPE | (1) catch per effort; (2) cytopathic effect |
| CRL | cell repository line (ATCC designation) |
| cRNA | complementary RNA |
| CSE | Coho Salmon embryo (a cell line) |
| CTM | critical thermal maximum |
| | |
| DBA | dot blot analysis (<i>or</i> assay) |
| DIDSON | dual-frequency imaging sonar |
| DO | dissolved oxygen |
| | |
| EIS | environmental impact statement |
| ELIFA | enzyme-linked immunofiltration assay |
| ELISA | enzyme-linked immunosorbent assay |
| EMAP | Environmental Monitoring and Assessment Program (EPA) |
| EMEM | Eagle's minimum essential medium |
| ENSO | El Niño–Southern Oscillation |
| ENV | erythrocytic necrosis virus |
| EPC | epithelioma papillosum cyprini ¹ |
| ERM | enteric redmouth (disease) |
| ESU | evolutionarily significant unit |
| | |
| <i>F</i> | instantaneous fishing mortality |
| F_{MAX} | fishing mortality at which yield per recruit is at a maximum |
| FAME | fatty acid methyl ester |
| FHM | Fathead Minnow (a cell line) |
| | |
| GH | growth hormone |
| GLC | gas–liquid chromatography |
| GLM | general linear model |
| GLS | generalized least squares |
| GnRH | gonadotropin-releasing hormone (synonym of LHRH) |
| GSI | gonadosomatic index |
| GtH | gonadotropic hormone |
| | |
| H&E | hematoxylin and eosin (<i>or</i> HE; a group of stains) |
| Hb | hemoglobin |
| HBSS | Hanks' balanced salt solution |
| HCG | human chorionic gonadotropin |
| Hct | hematocrit |
| HPI axis | hypothalamic–pituitary–interrenal axis |
| HPLC | high-performance liquid chromatography |

¹ A cell line derived from an epithelial tumor of Common Carp.

| | |
|----------------------|--|
| HSD | honestly significantly different (<i>or</i> honestly significant difference) |
| HUFA | highly unsaturated fatty acid |
| IBI | index of biotic integrity |
| ICP | inductively coupled argon plasma emission spectrometry |
| ID | inside diameter |
| IgA | immunoglobulin A (other immunoglobulins: IgD, IgE, IgG, IgM) |
| IHNV | infectious hematopoietic necrosis virus |
| <i>I_n</i> | incipient lethal temperature |
| INAD | investigational new animal drug (a type of FDA permit) |
| ip | (<i>or</i> i.p.) intraperitoneal(ly) |
| IPNV | infectious pancreatic necrosis virus |
| <i>K</i> | condition factor (usually $10^5 \times \text{weight} / \text{fork length}^3$) |
| K/A | alkaline/acid |
| KDM | kidney disease medium |
| LC50 | concentration lethal to 50% of test organisms in a specified time |
| LD50 | dose lethal to 50% of test organisms in a specified time |
| LH | luteinizing hormone |
| LHRF | luteinizing hormone releasing factor (synonym for LHRH) |
| LHRH | luteinizing hormone releasing hormone |
| LILT | lower incipient lethal temperature |
| LOEC | lowest-observed-effect concentration |
| LPS | lipopolysaccharide |
| LSD | least significant difference |
| LT50 | temperature lethal to 50% of test organisms in a specified time |
| LWD | large woody debris |
| <i>M</i> | instantaneous natural mortality |
| MAB | (<i>or</i> MoAb) monoclonal antibody |
| MANOVA | multivariate analysis of variance |
| MATC | maximum acceptable toxicant concentration |
| <i>m/e</i> | (<i>or</i> <i>m/z</i>) ratio of molecular mass to ionic charge |
| MEI | morphoedaphic index |
| MEM | minimum essential medium |
| meq | milliequivalents (blood Na and K often expressed as meq/L) |
| MIC | minimum inhibitory concentration |
| mil | measure of thickness (1 mil = 0.001 in = 0.0254 mm) |
| MS | mean square |
| MSE | mean square error |
| MSH | melanocyte-stimulating hormone |
| msl | mean sea level |
| MSY | maximum sustainable yield |
| NOEC | no-observed-effect concentration |

| | |
|------------------|---|
| nRNA | nuclear RNA |
| OD | (1) optical density; (2) outside diameter |
| OLS | ordinary least squares |
| OSY | optimum sustainable yield |
| OTC | oxytetracycline |
| PAGE | polyacrylamide gel electrophoresis |
| PAH | polycyclic aromatic hydrocarbon |
| PAS | periodic acid–Schiff (a stain) |
| PAUP | phylogenetic analysis using parsimony |
| PBS | phosphate-buffered saline |
| PC(A) | principal component (analysis) |
| Pco ₂ | (<i>or pCO₂</i>) partial pressure of CO ₂ |
| PCR | polymerase chain reaction |
| pdf | probability density function |
| PGD | proliferative gill disease |
| PO ₂ | (<i>or pO₂</i>) partial pressure of oxygen gas |
| PONAR | dredge used to sample sediments (<i>not spelled out</i>) |
| PSD | proportional stock density |
| PUFA | polyunsaturated fatty acid |
| Q | discharge or flow of water ² |
| Q_{10} | factor by which a physiological rate increases per 10°C rise in temperature |
| RAPD | randomly amplified polymorphic DNA |
| RBC | (<i>or rbc</i>) red blood cell |
| RFLP | restriction fragment length polymorphism |
| RIA | radioimmunoassay |
| RKM | (<i>or rkm</i>) river kilometer (<i>define point of origin</i>) |
| RM | river mile |
| rms | root mean square |
| RSD | relative stock density |
| RTH | Rainbow Trout hepatoma (a cell line) |
| SDA | specific dynamic action (heat loss from digestion [J/{kg × h}]) |
| SDI | shoreline development index |
| SDS | sodium dodecyl sulfate |
| SGR | specific growth rate |
| SH | sulfhydryl |
| SOPHEIA | solid-phase enzyme immunoassay |
| sp. | species (singular; plural: spp.) |
| SPF | specific-pathogen free |
| S–R | stock–recruitment |

² Subscripts denote frequency (e.g., Q_{50} = a 50-year flood, $Q_{2.33}$ = a discharge that occurs every 2.33 years on average.)

| | |
|--------|--|
| SS | sum of squares |
| SSE | Sockeye Salmon embryo (a cell line) |
| ssp. | subspecies |
| SST | sea surface temperature |
| STE | salt–tris–EDTA |
| | |
| TAC | total allowable catch |
| TAE | tris–acetate–EDTA (a buffer) |
| TAN | total ammonia nitrogen |
| TBE | tris–boric acid (borate)–EDTA (a buffer) |
| TCID50 | tissue culture infective dose producing cytopathic effect in 50% of cultures |
| TDS | total dissolved solids |
| TE | tris–EDTA (a buffer) |
| TED | turtle excluder device |
| TLC | thin-layer chromatography |
| TSB | trypticase (<i>or</i> tryptic) soy broth |
| TYES | trypticase yeast extract agar + skim milk |
| | |
| UILT | upper incipient lethal temperature |
| UPGMA | unweighted pair-group method with arithmetic averages |
| | |
| VHS(V) | viral hemorrhagic septicemia (virus) |
| VPA | virtual population analysis |
| | |
| Z | instantaneous total mortality (natural + fishing) |