List of superlative trees

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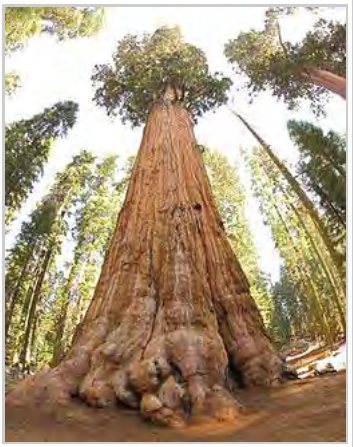
The world's **superlative trees** can be ranked by any factor. Records have been kept for trees with superlative height, trunk diameter or girth, canopy coverage, airspace volume, wood volume, estimated mass, and age.



View of the General Sherman tree from below. The General Sherman tree is largest by volume: this view exaggerates apparent height

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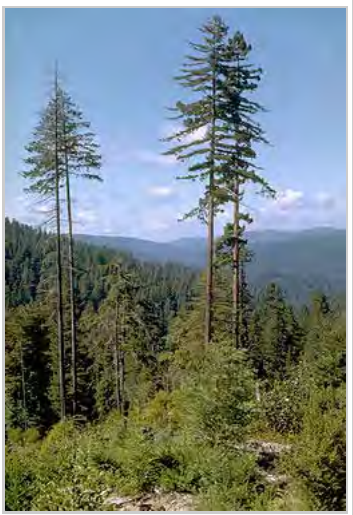
Tallest

The heights of the tallest trees in the world have been the subject of considerable dispute and much exaggeration. Modern verified measurements with laser rangefinders, or with tape drop measurements made by tree climbers (such as those carried out by canopy researchers), have shown that some older measuring methods and measurements are often unreliable, sometimes producing exaggerations of 5% to 15% or more above the real height.[1] Historical claims of trees growing to 130 m (430 ft), and even 150 m (490 ft), are now largely disregarded as unreliable, and attributed to human error.



The coniferous Coast Redwood (*Sequoia sempervirens*) is the tallest tree species on earth.

The following are the tallest reliably measured specimens from the top species. This list shows only currently standing specimens:

1. Coast Redwood (*Sequoia sempervirens*): **115.92 m (380.3 ft)**, "Hyperion", Redwood National Park, California, United States. Latest updated height[2][3][4][5]
2. Coast Douglas-Fir (*Pseudotsuga menziesii var. menziesii*): **99.7 m (327 ft)**, Brummit Creek, Coos County, Oregon, United States[6][7][8]
3. Mountain Ash (*Eucalyptus regnans*): **99.6 m (326.8 ft)**, "Centurion", Arve Valley, Tasmania, Australia[9][10]
4. Sitka Spruce (*Picea sitchensis*): **96.7 m (317 ft)**, Prairie Creek Redwoods State Park, California, United States[11][12]
5. Giant Sequoia (*Sequoiadendron giganteum*): **95.7 m (314 ft)**, Sequoia National Forest, California, United States[13][14]
6. Yellow Meranti (*Shorea faguetiana*): **94.1 m (309 ft)**, Danum Valley, in Sabah on the island of

Borneo[15]

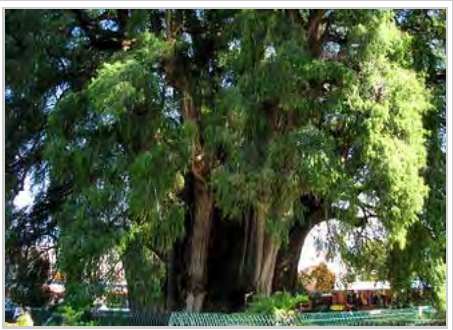
7. Manna Gum (*Eucalyptus viminalis*): **91 m (299 ft)**, "White Knight", Evercreech Forest Reserve, Tasmania, Australia[16]
8. Southern Blue Gum (*Eucalyptus globulus*): **90.7 m (298 ft)**, Tasmania, Australia[17]
9. Alpine Ash (*Eucalyptus delegatensis*): **87.9 m (288 ft)**, Tasmania, Australia[17]
10. Brown Top Stringbark (*Eucalyptus obliqua*): **86 m (282 ft)** "King Stringy", Tasmania, Australia.[18]
11. Sugar Pine (*Pinus lambertiana*): **83.45 m (273.8 ft)** near Yosemite National Park, California.[19]
12. Western Hemlock (*Tsuga heterophylla*): **83.34 m (273.4 ft)** was discovered in November 2014 by Mario Vaden and Chris Atkins in Prairie Creek Redwoods State Park, California.[20]
13. Ponderosa Pine (*Pinus ponderosa*): **81.77 m (268.3 ft)** in Myers Creek drainage of Rogue River – Siskiyou National Forest, Oregon.[21][22]
14. Entandrophragma excelsum: **81.5 m (267 ft)** at Kilimanjaro [23]
15. Grand Fir (*Abies grandis*): **81.4 m (267 ft)** in the Glacier Peak Wilderness, Washington.[24]
16. Lawson Cypress (*Chamaecyparis lawsoniana*): **81.08 m (266.0 ft)**, In Jedediah Smith Redwoods State Park, California.[25]

Deepest

A wild Fig tree growing in Echo Caves near Ohrigstad, South Africa has roots going 121.92 m (400.0 ft) deep, giving it the deepest roots known of any tree. [26]

Largest by single-stem wood volume

The largest trees in total wood volume are both tall and large in diameter and, in particular, hold a large diameter high up the trunk. Measurement is very complex, particularly if branch volume is to be included as well as the trunk volume, so measurements have only been made for a small number of trees, and generally only for the trunk. Few attempts have ever been made to include root or leaf volume.


Árbol del Tule

The top eleven species measured so far are*:

1. Giant Sequoia (*Sequoiadendron giganteum*): **1,487 m³** (52,508 cu ft), General Sherman[27] Sequoia National Park
2. Coast Redwood (*Sequoia sempervirens*): **1,084+ m³** (38,299+ cu ft), Grogan's Fault[28]
3. Montezuma Cypress (*Taxodium mucronatum*): **750 m³** (25,000 cu ft), Árbol del Tule[29]
4. Kauri (*Agathis australis*) : **516 m³** (18,222 cu ft), Tāne Mahuta, Waipoua Forest, New Zealand[30]
5. Western Redcedar (*Thuja plicata*): **500 m³** (17,650 cu ft), Quinault Lake Redcedar[27]
6. *Eucalyptus regnans*: **391 m³** (13,808 cu ft), Still Sorrow[31]
7. Tasmanian Blue Gum (*Eucalyptus globulus*): **368 m³** (13,000 cu ft), Rullah Longatyle (Strong Girl, also Grieving Giant)[17]
8. Coast Douglas-fir (*Pseudotsuga menziesii*) **349 m³** (12,320 cu ft) Red Creek Tree
9. Sitka Spruce (*Picea sitchensis*) **337 m³** (11,920 cu ft) Queets Spruce[32]
10. *Eucalyptus obliqua*: **337 m³** (11,920 cu ft) "Gothmog," Styx Tall Trees FP, Tasmania.[17]

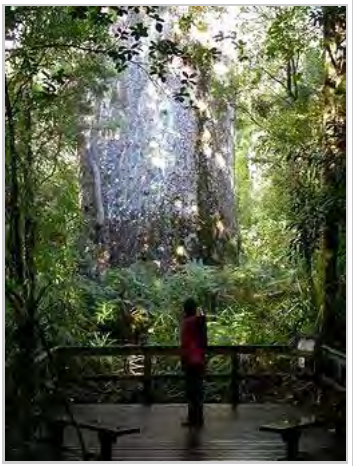
11. *Eucalyptus delegatensis*: **286 m³** (10,100 cu ft), located in Styx River Valley[17]

(*)This list does not take into account specimens no longer living.

Stoutest

The girth of a tree is usually much easier to measure than the height, as it is a simple matter of stretching a tape round the trunk, and pulling it taut to find the circumference. Despite this, UK tree author Alan Mitchell made the following comment about measurements of yew trees:

> The aberrations of past measurements of yews are beyond belief. For example, the tree at Tisbury has a well-defined, clean, if irregular bole at least 1.5 m long. It has been found to have a girth that dilated and shrunk in the following way: 11.28 m (1834 Loudon), 9.3 m (1892 Lowe), 10.67 m (1903 Elwes and Henry), 9.0 m (1924 E. Swanton), 9.45 m (1959 Mitchell) ... Earlier measurements have therefore been omitted.
>
> — Alan Mitchell; in a handbook "*Conifers in the British Isles*".[33]



Trunk of Te Matua Ngahere

As a general standard, tree girth is taken at "breast height". This is converted to and cited as **dbh** (diameter at breast height) in tree and forestry literature.[34][35] Breast height is defined differently in different situations, with most forestry measurements taking girth at 1.3 m above ground,[35] while those who measure ornamental trees usually measure at 1.5 m above ground;[34] in most cases this makes little difference to the measured girth. On sloping ground, the "above ground" reference point is usually taken as the highest point on the ground touching the trunk,[34][35] but in North America a point, that is the average of the highest point and the lowest point the tree trunk appears to contact the soil, is usually used.[36] Some of the inflated old measurements may have been taken at ground level. Some past exaggerated measurements also result from measuring the complete next-to-bark measurement, pushing the tape in and out over every crevice and buttress.[33] The measurements could also be influenced by deviation of the tape measure from a horizontal plane (which might seem called for if the trunk does not grow straight up), and the presence of features such as branches, spikes, *etc*.

Modern trends are to cite the tree's diameter rather than the circumference. The diameter of the tree is calculated by finding the mean diameter of the trunk, in most cases obtained by dividing the measured circumference by π; this assumes the trunk is mostly circular in cross-section (an oval or irregular cross-section would result in a mean diameter slightly greater than the assumed circle). Accurately measuring circumference or diameter is difficult in species with the large buttresses that are characteristic of many species of rainforest trees. Simple measurement of circumference of such trees can be misleading when the circumference includes much empty space between buttresses. See also Tree girth measurement

Baobabs (genus *Adansonia*) store large amounts of water in the very soft wood in their trunks. This leads to marked variation in their girth over the year (though not more than about 2.5%[37]), reaching maximum at the end of the rainy season, and minimum at the end of the dry season.

The stoutest living single-trunk species in diameter are:

1. Montezuma Cypress (*Taxodium mucronatum*): **11.62 m (38.1 ft)**, "Árbol del Tule", Santa Maria del Tule, Oaxaca, Mexico.[38] This diameter includes buttressing. A more accurate mean diameter for this tree is 9.38 m (30.8 ft).[38]
2. Baobab (*Adansonia digitata*): **10.64 m (34.9 ft)**, "Sunland Baobab", South Africa. Renowned because a bar and wine cellar operates inside its hollow trunk.
3. Coast Redwood (*Sequoia sempervirens*): **8.90 m (29.2 ft)**, "Jupiter", Redwood National Park, California, United States[39][40]
4. Giant Sequoia (*Sequoiadendron giganteum*): **8.85 m (29.0 ft)**, "General Grant", General Grant Grove, California, United States[41]
5. Za (*Adansonia za*): **8.85 m (29.0 ft)**,"The Ampanihy Baobab", North of Morombe, S.W. Madagascar,[42]
6. Chinese Camphor Tree (*Cinnamomum camphora*) **8.23 m (27.0 ft)**,"Kamou no Okusu", Kamou, Kagoshima, Japan.[43][44]
7. *Eucalyptus obliqua*: **6.72 m (22.0 ft)**
8. *Eucalyptus regnans*: **6.52 m (21.4 ft)**, "Big Foot", Geeveston, Tasmania
9. Western Redcedar (*Thuja plicata*): **5.94 m (19.5 ft)**, "Quinault Lake Cedar", Olympic National Park[45]
10. *Eucalyptus delegatensis*: **5.82 m (19.1 ft)**, "Troll", Hermons Road, Tasmania, Australia.
11. Sitka Spruce (*Picea sitchensis*): **5.39 m (17.7 ft)**, "Quinault Lake Spruce", Olympic National Park
12. Kauri (*Agathis australis*): **5.33 m (17.5 ft)**, "Te Matua Ngahere", Waipoua Forest, New Zealand[46]

Measurements become ambiguous when multiple trunks (whether from an individual tree or multiple trees) grow together. The Sacred Fig grows adventitious roots from its branches, which become new trunks when the root reaches the ground and thickens; a single sacred fig tree can have hundreds of such trunks.[47] The multi-stemmed Hundred Horse Chestnut was known to have a circumference of 57.9 m (190 ft) when it was measured in 1780.

There are known more than 50 species of trees exceeding the diameter of 4.45 m or circumference of 14 m.

Oldest

The oldest trees are determined by growth rings, which can be seen if the tree is cut down, or in cores taken from the bark to the center of the tree. Accurate determination is only possible for trees that produce growth rings, generally those in seasonal climates. Trees in uniform non-seasonal tropical climates grow continuously and do not have distinct growth rings. It is also only possible for trees that are solid to the center. Many very old trees become hollow as the dead heartwood decays. For some of these species, age estimates have been made on the basis of extrapolating current growth rates, but the results are usually largely speculation. White (1998)[48] proposes a method of estimating the age of large and veteran trees in the United Kingdom through the correlation of a tree's age with its diameter and growth character.

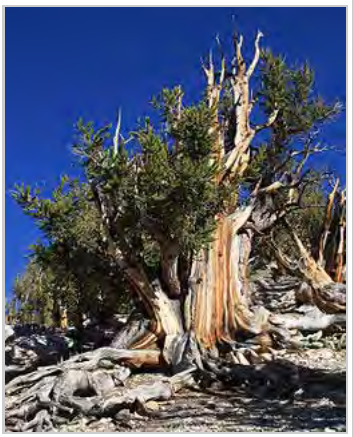
The verified oldest measured ages are:

1. Great Basin Bristlecone Pine (*Pinus longaeva*): 5,066 years[49]
2. Alerce (*Fitzroya cupressoides*): 3,645 years[50]
3. Giant Sequoia (*Sequoiadendron giganteum*): 3,266 years[49]
4. Western Juniper (*Juniperus occidentalis*): 2,675 years[49]

Other species suspected of reaching exceptional age include European Yew (*Taxus baccata*) (probably over 2,000 years[51][52]), Sugi (*Cryptomeria japonica*) (3,000 years or more[53]), and Western Redcedar (*Thuja plicata*). The oldest known European Yew may be the Llangernyw Yew in the Churchyard of Llangernyw village in North Wales, or the Fortingall Yew in Perthshire, Scotland. These yews may be from 1,500 to 3,000 years old.[54]

The olive tree also can live for centuries. The oldest verified age is 900 years[55] at Gethsemane (Mount of Olives, as mentioned in the Bible), while several other olive trees are suspected of being 2,000 to 3,000 years old.[56]

The pond cypress, *Taxodium ascendens*, has been known to live more than 1,000 years. One specimen in particular, named "The Senator", was estimated to be more than 3,400 years old at the time of its demise in early 2012.



Great Basin bristlecone pine (*Pinus longaeva*) is the longest living tree species on earth.

See also

- Ancient woodland
- Arboretum
- Clearcutting
- Deforestation
- Dendrology
- Dendrometry
- Exploding tree
- Forest
- Forest management
- Frost crack
- Fruit tree
- Gilroy Gardens
- Illegal logging
- List of trees
- Lists of trees
- List of old-growth forests
- List of tree genera
- List of trees and shrubs by taxonomic family
- List of world records held by plants
- Mother of the Forest
- Multipurpose tree
- Old-growth forest
- Topiary
- Tree allometry
- Tree climbing
- Tree crown measurement
- Tree fork
- Tree girth measurement
- Tree health
- Tree height measurement

- Tree line
- Tree measurement
- Tree sitting
- Tree volume measurement
- Urban forestry
- Woodland

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External links

- Notable and Ancient Trees in Britain and Ireland (http://www.treeregister.org/)
- Monumental trees (http://www.monumentaltrees.com/en/)
- M. D. Vaden, arborist who measures tree sizes (http://www.mdvaden.com/news.shtml)
- Calaveras Big Trees Association (CBTA) (http://bigtrees.org/)
- Tasmania's giant trees (http://www.webcitation.org/5Qf1WBFjP)
- National Register of Big Trees. Australia's Champion Trees (http://www.nationalregisterofbigtrees.com.au/)
- The New Zealand Tree Register - A project of the New Zealand Notable Trees Trust (NZNTT) (http://www.notabletrees.org.nz/)
- Old Trees in The Netherlands and Western Europe (http://www.bomeninfo.nl/english1.htm)
- Photo Tours: Science Atop the World's Largest Trees (http://wayback.archive.org/web/20091018143824/http://www.humboldt.edu/redwoods/photos)
- article about The Senator (http://wayback.archive.org/web/20120211233658/http://www.floridata.com/tracks/thesenator/thesenator.cfm)

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