

CARY SCIENCE CONVERSATION

The Afterlife of Trees

Presented by

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www.caryinstitute.org

FROM LIFE TO THE AFTERLIFE

FROM
CONSTRUCTION

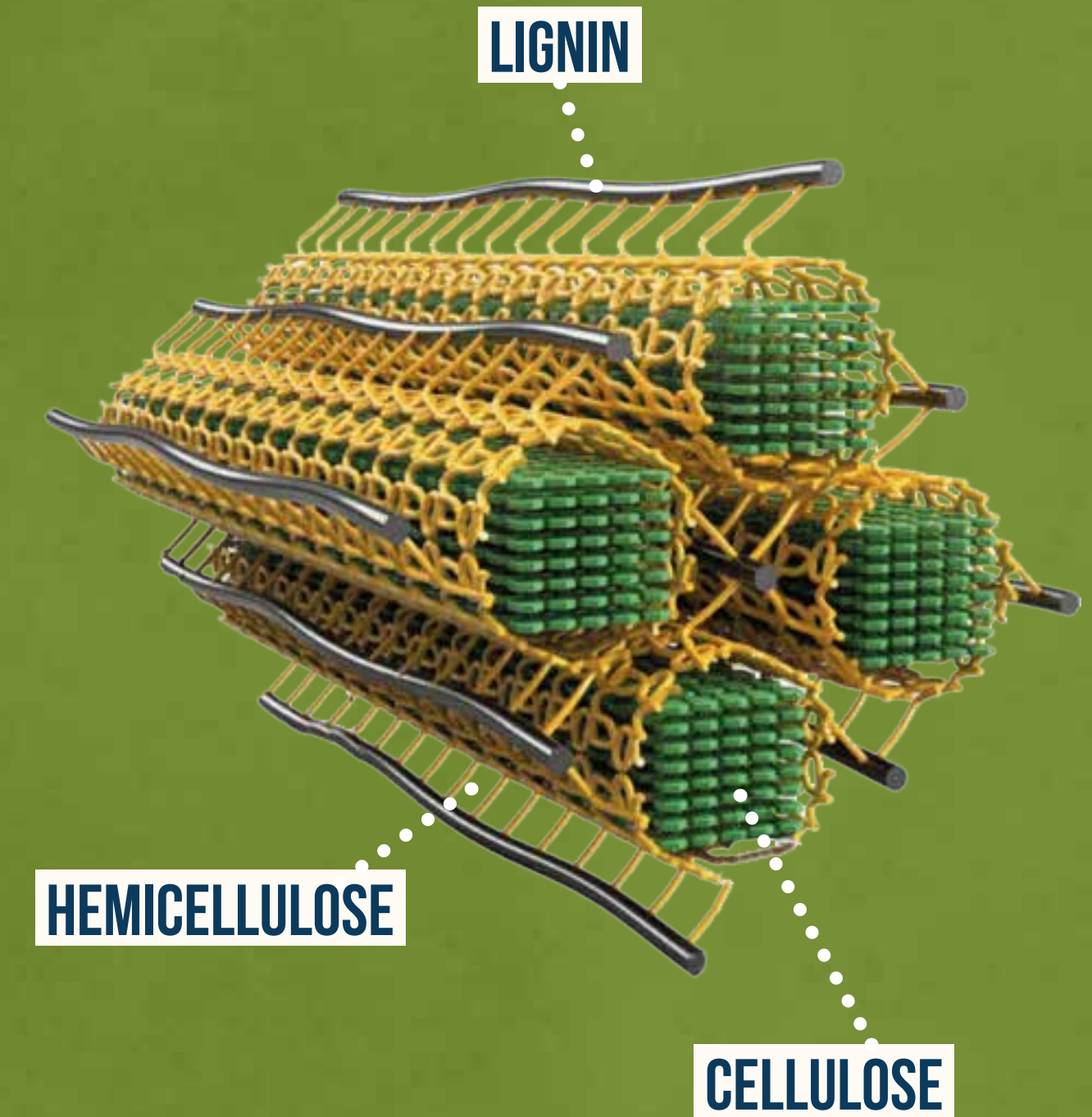


WOOD TRAITS

density

anatomy

chemistry



TO
DECONSTRUCTION

How do plant traits affect the fate of wood?

THE IMPORTANCE OF DEADWOOD

SUPPORTS LIFE



FOOD WEBS



HABITAT FOR LIVING THINGS



BIODIVERSITY

NUTRIENT CYCLING + SOIL HEALTH



CARBON CYCLE

82.6 BILLION TONNES

estimated carbon stored by
deadwood

sink

9 BILLION TONNES

estimated carbon released by
deadwood annually

source

“At the time a tree dies, it has only partially fulfilled its potential ecological function.”

— Jerry Franklin, ecologist

WHAT DETERMINES HOW WOOD DECAYS?

WOOD TRAITS

density
anatomy
chemistry



AGENTS OF DECAY

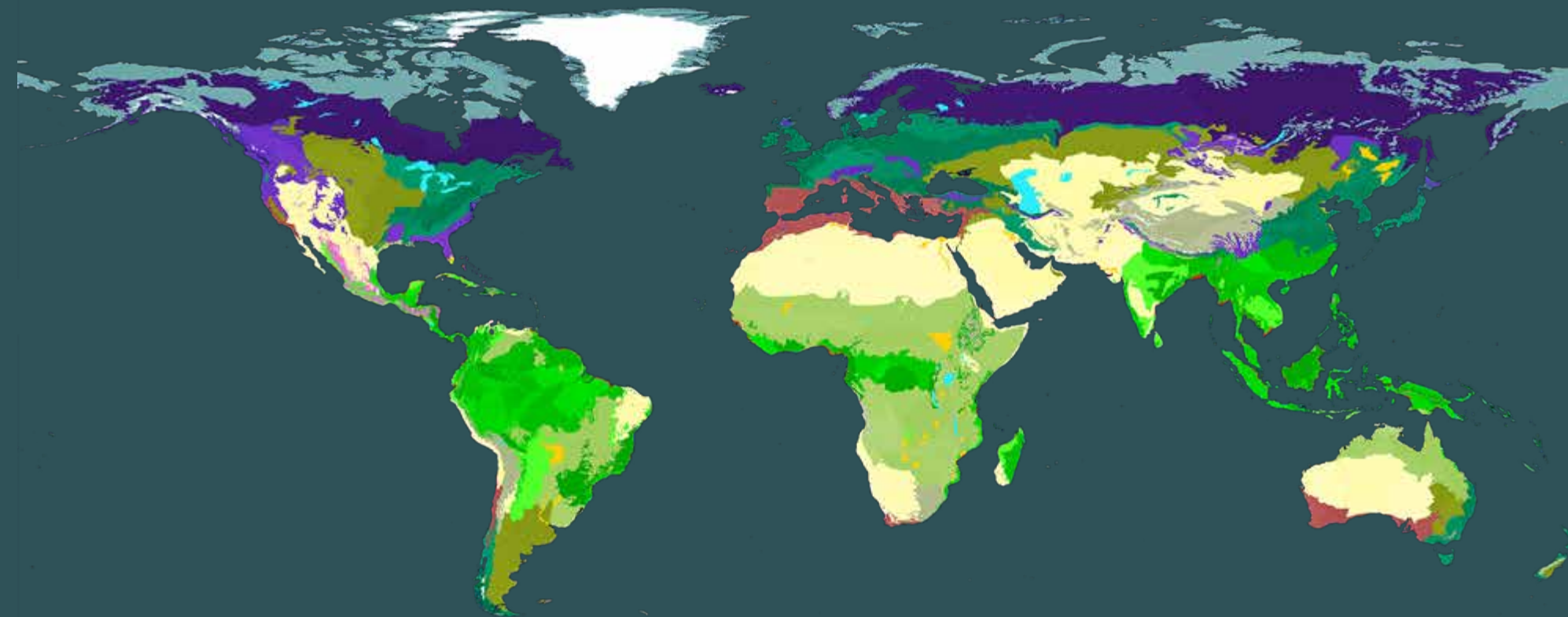
ABIOTIC (NON-LIVING)



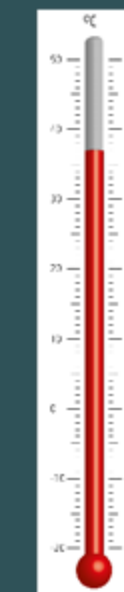
BIOTIC (LIVING)



ENVIRONMENTAL CONDITIONS



temperature



rainfall



CONSUMERS OF THE DEAD

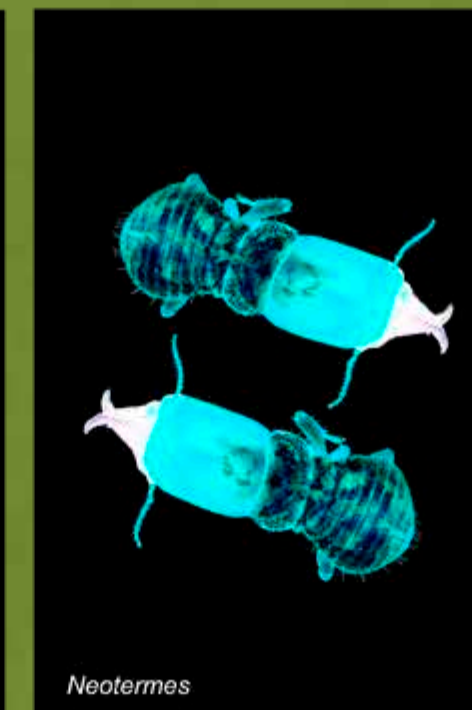
FUNGI



~2.2 to 3.8 million fungal species; 90% still unknown to science
Fungal biomass is ~6x the total biomass of all animals on Earth

TERMITES

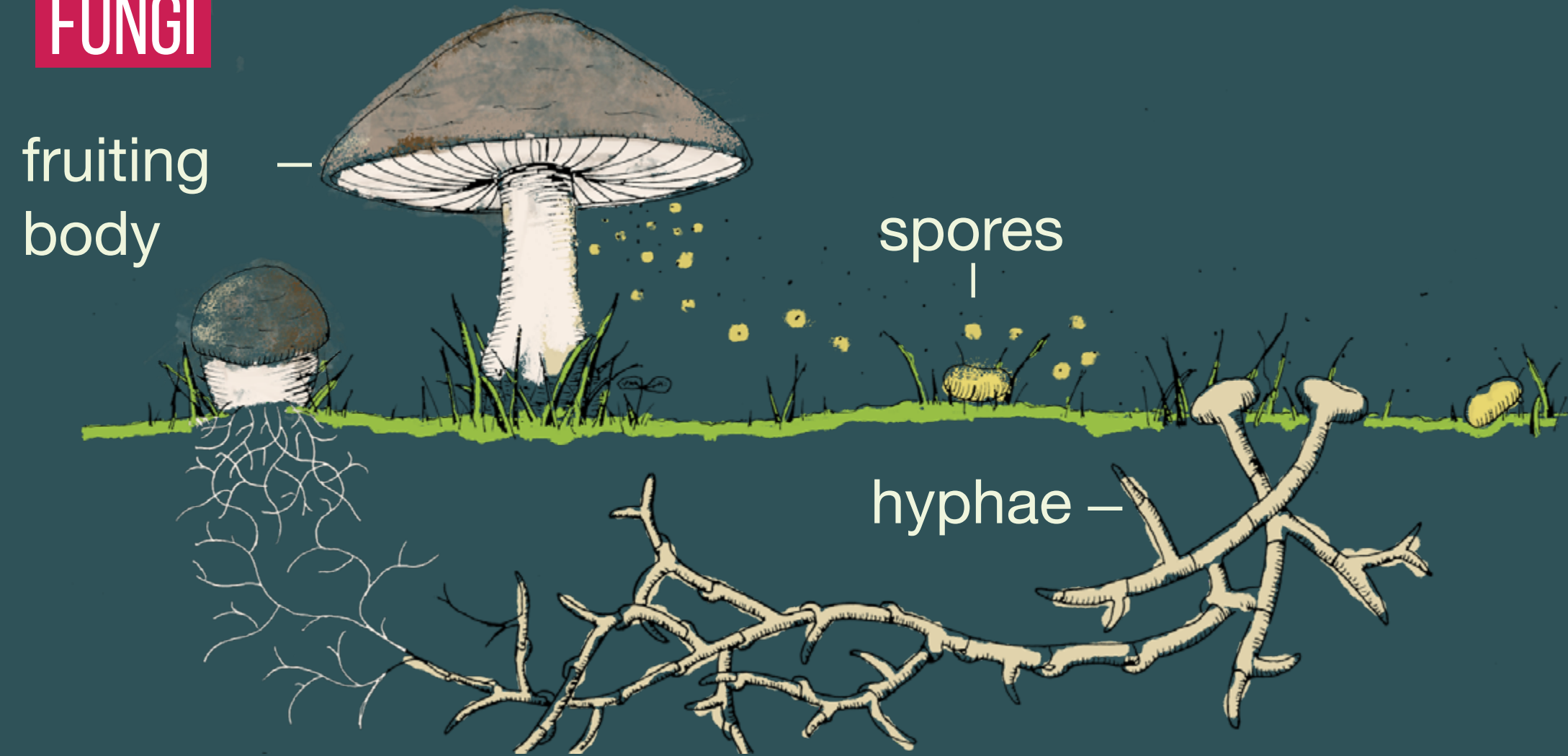
Artwork by Donna Davis with micro
imagery supplied by Rebecca Clement



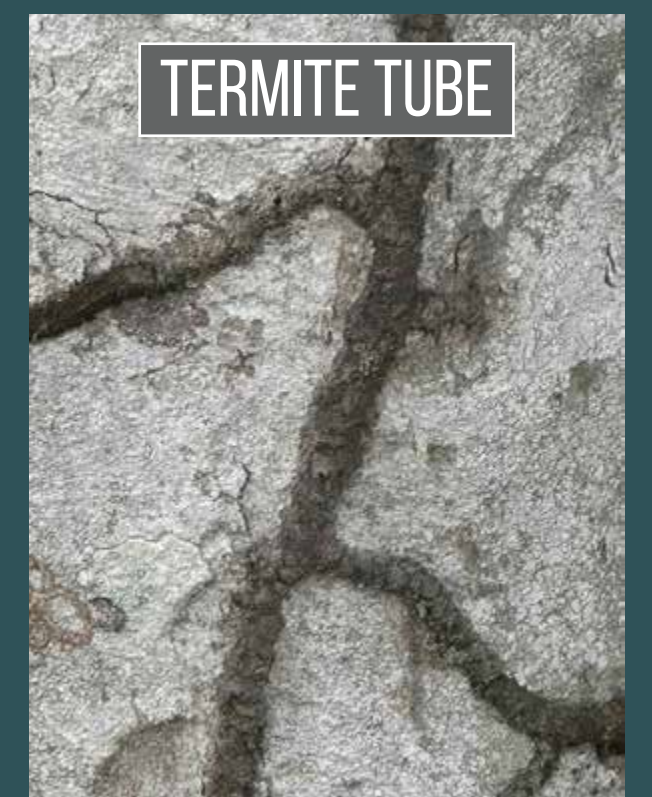
3,000+ termite species; only 3% are pests to humans
Global biomass of termites $\cong$ cows $\cong$ humans

FROM DISCOVERY TO DECAY

FUNGI



TERMITES





TEMPERATE FORESTS: WOOD TRAITS & DECAY



MIXED DECIDUOUS FOREST



Different tree species = Different rates of decay

ROT PLOTS



LOSS OF BIOMASS

YEAR 1

~27%

YEAR 3

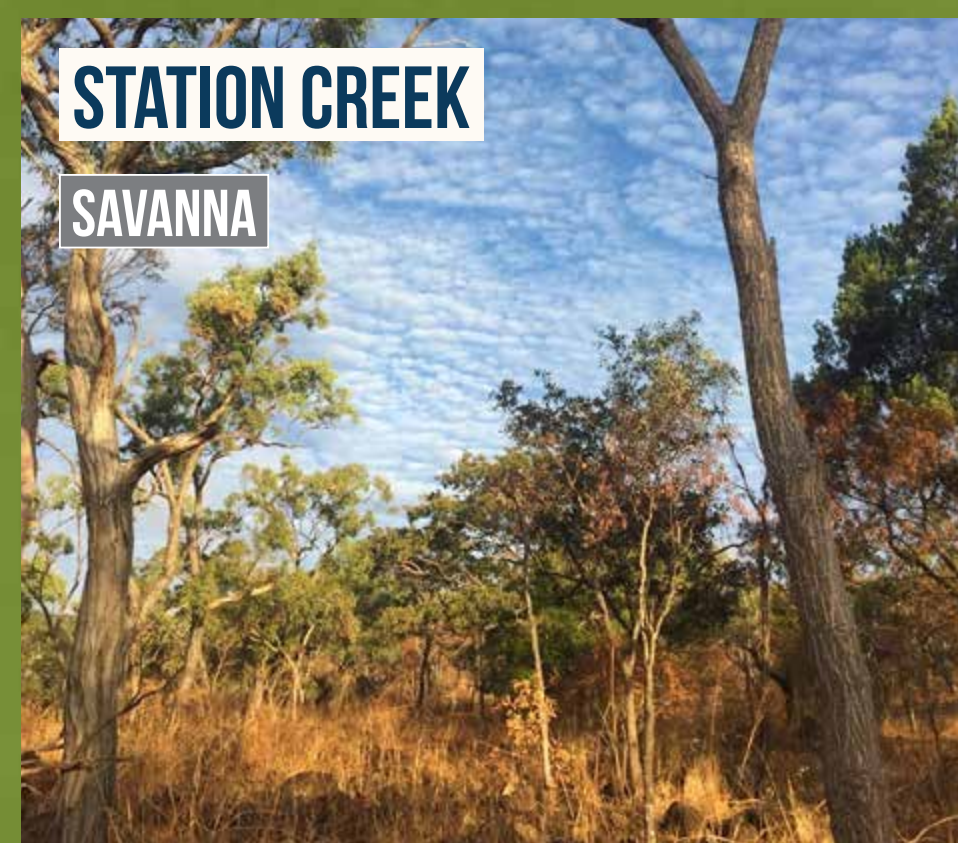
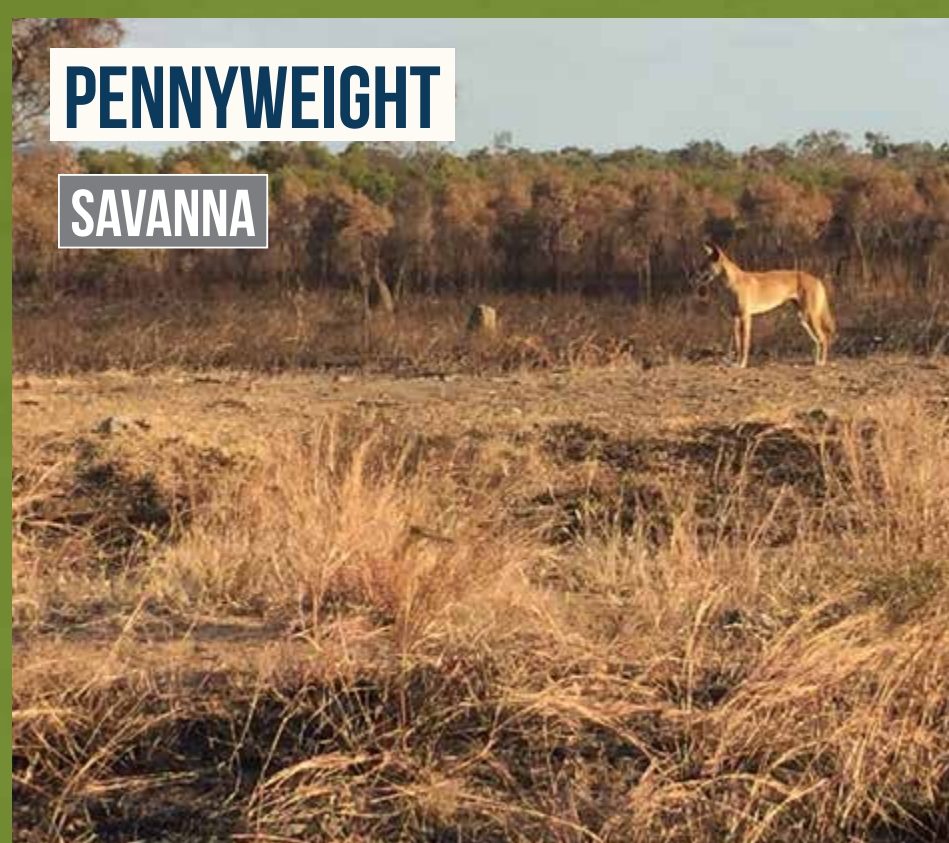
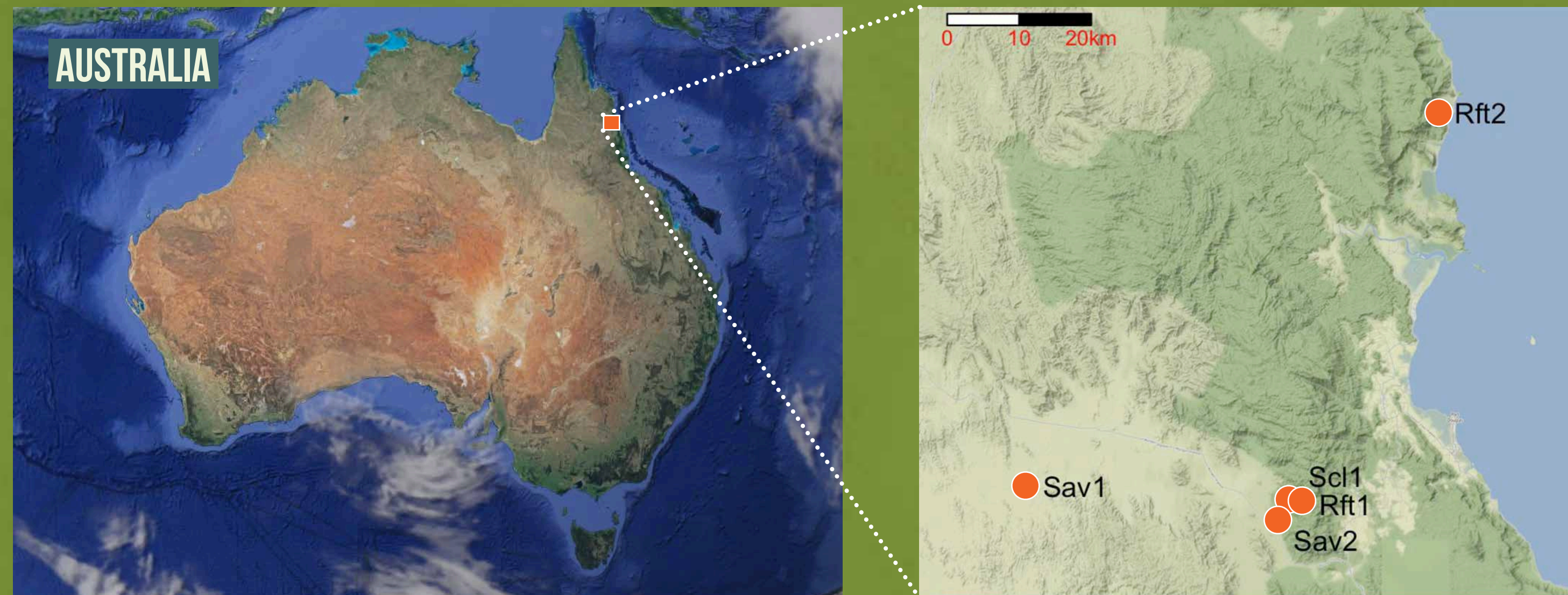
~52%

FOLLOWING THE DEAD: RESEARCH IN THE TROPICS

A woman with blonde hair tied back, wearing a dark t-shirt and a blue headband, is crouching in a field of tall, dry grass. She is holding a large, round, woven basket made of dried grass or straw. The background is a dense thicket of tropical vegetation. The scene is brightly lit, suggesting daylight.

Most of the deadwood pool is in the tropics.

THE AFTERLIFE IN QUEENSLAND



driest
600-700mm/yr

wettest
6000-7000mm/yr

TERMITES & THE CARBON CYCLE

ROT PLOTS



HOLLOW TREES



TERMITE MOUNDS



CROWD-SOURCING A GLOBAL TERMITE STUDY



108 COLLABORATORS.

6 CONTINENTS.

133 SITES.



FINDING

termite wood decay increases by more than **6.8X** for every **10°C** rise in temperature

THE FATE OF CARBON: TERMITE MOUNDS & TROPICAL DEADWOOD



WHAT CAN YOU DO?

Leave the Dead Alone



Resist the urge to keep things tidy. Dead and dying plants play a vital role in a healthy ecosystem.

Support Science



Invest in the research needed to understand how the world works.

Use Your Voice



Advocate for the preservation of wild places.