

AGTA  
Awards  
Winner 2022



# DRONES IN FORESTRY

CURRICULUM MAPPING

Years 9–10



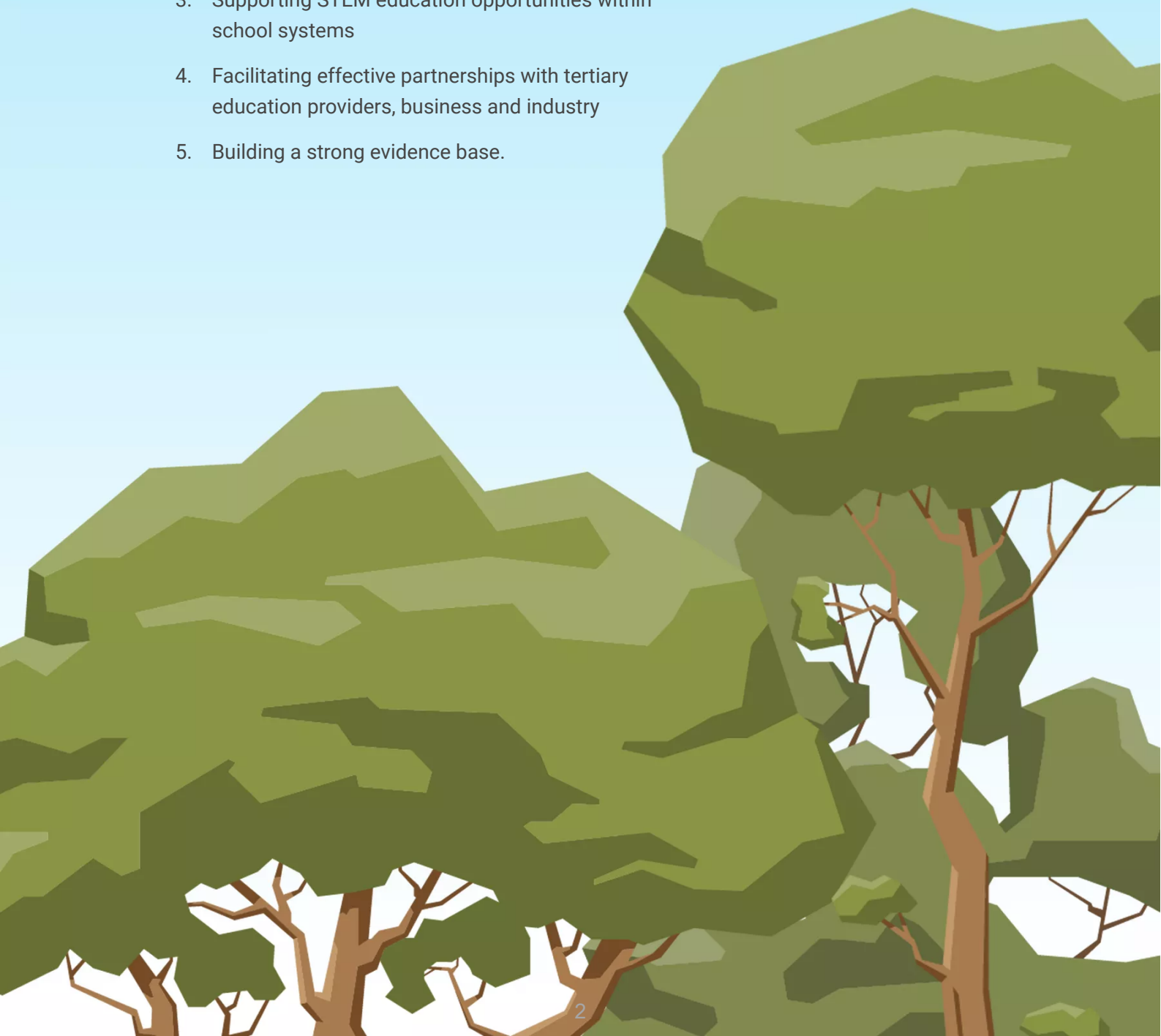
All units of work designed and created by She Maps are linked to the Australian Curriculum across multiple learning areas both inside and outside the STEM-identified subjects.

By using these programs you help to equip your students with the necessary STEM skills and knowledge that will enable them to engage with the careers of the future.

Working in collaboration with schools we set out to achieve the five strategies of action outlined in the [Australian STEM education strategy](#).

This includes:

1. Increasing student STEM ability, engagement, participation, and aspiration
2. Increasing teacher capability and STEM teaching quality
3. Supporting STEM education opportunities within school systems
4. Facilitating effective partnerships with tertiary education providers, business and industry
5. Building a strong evidence base.





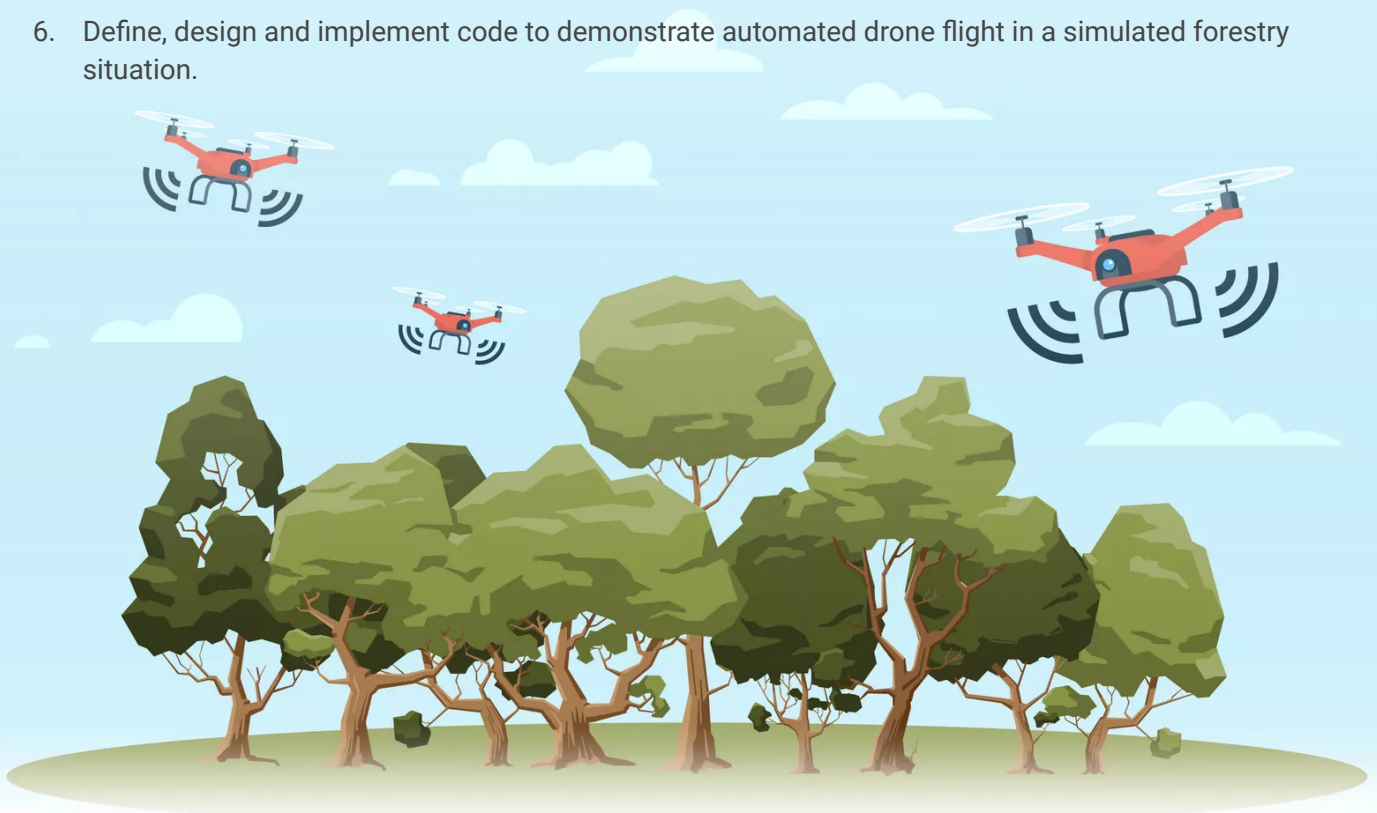
# DIGITAL TECHNOLOGIES AND GEOGRAPHY UNIT

## Digital Systems In Forestry

Students will explore and understand how drones and Geographic Information systems (GIS) assist forestry workers to manage the forest environments that provide sustainable resources for society. They will learn through the use of systems thinking, research digital systems in forestry and understand how they are managed considering environmental, social, economic and technical factors. Students will research and present a case study of how a forestry worker uses drones and digital systems and present this information in the form of a website. They will then complete a simulated forestry drone mission.

By completing all modules in this unit, students will:

1. Understand systems thinking
2. Analyse the environmental, social and economic impact of digital systems in Forestry
3. Develop a Digital Systems in Forestry Report for potential clients or financial backers including a risk assessment plan.
4. Research content, source assets and develop a website using HTML and CSS to present a case study of a Forestry worker
5. Design, define and implement a manual flight plan in a simulated forestry training environment
6. Define, design and implement code to demonstrate automated drone flight in a simulated forestry situation.





# YEARS 9 - 10

## YEARS 9 AND 10 DIGITAL TECHNOLOGIES ACHIEVEMENT STANDARD

By the end of Year 10, *students explain the control and management of networked digital systems and the security implications of the interaction between hardware, software and users. They explain simple data compression, and why content data are separated from presentation.*

*Students plan and manage digital projects using an iterative approach. They define and decompose complex problems in terms of functional and non-functional requirements. Students design and evaluate user experiences and algorithms. They design and implement modular programs, including an object-oriented program, using algorithms and data structures involving modular functions that reflect the relationships of real-world data and data entities. They take account of privacy and security requirements when selecting and validating data. Students test and predict results and implement digital solutions. They evaluate information systems and their solutions in terms of risk, sustainability and potential for innovation and enterprise. They share and collaborate online, establishing protocols for the use, transmission and maintenance of data and projects.*

| CONTENT DESCRIPTIONS                                 |   | YEARS 9 AND 10 |
|--|---|----------------|
| Digital Technologies – Knowledge and understanding   | Investigate the role of hardware and software in managing, controlling and securing the movement of and access to data in networked digital systems                           | ACTDIK034      |
|  | Analyse simple compression of data and how content data are separated from presentation   | ACTDIK035      |
| Digital Technologies – Process and Production Skills | Develop techniques for acquiring, storing and validating quantitative and qualitative data from a range of sources, considering privacy and security requirements             | ACTDIP036      |
|  | Define and decompose real- world problems precisely, taking into account functional and non-functional requirements and including interviewing stakeholders to identify needs | ACTDIP038      |
|  | Design the user experience of a digital system by evaluating alternative designs against criteria including functionality, accessibility, usability, and aesthetics           | ACTDIP039      |
|  | Design algorithms represented diagrammatically and in structured English and validate algorithms and programs through tracing and test cases                                  | ACTDIP040      |
|  | Implement modular programs, applying selected algorithms and data structures including using an object-oriented programming language  | ACTDIP041      |



| CONTENT DESCRIPTIONS   |  | YEARS 9 AND 10 |
|--|--|----------------|
| Digital Technologies – Process and Production Skills (cont') | Evaluate critically how student solutions and existing information systems and policies, take account of future risks and sustainability and provide opportunities for innovation and enterprise | ACTDIP042      |
|  | Create interactive solutions for sharing ideas and information online, taking into account safety, social contexts and legal responsibilities  | ACTDIP043      |
|  | Plan and manage projects using an iterative and collaborative approach, identifying risks and considering safety and sustainability  | ACTDIP044      |



## YEAR 9 GEOGRAPHY ACHIEVEMENT STANDARD

*By the end of Year 9, students explain how geographical processes change the characteristics of places. They analyse interconnections between people, places and environments and explain how these interconnections influence people, and change places and environments. They predict changes in the characteristics of places over time and identify the possible implications of change for the future. Students analyse alternative strategies to a geographical challenge using environmental, social and economic criteria.*

*Students use initial research to identify geographically significant questions to frame an inquiry. They evaluate a range of primary and secondary sources to select and collect relevant and reliable geographical information and data. They record and represent multi-variable data in a range of appropriate digital and non-digital forms, including a range of maps that comply with cartographic conventions. They use a range of methods and digital technologies to interpret and analyse maps, data and other information to propose explanations for patterns, trends, relationships and anomalies across time and space, and to predict outcomes. Students synthesise data and information to draw reasoned conclusions. They present findings, arguments and explanations using relevant geographical terminology and digital representations in a range of appropriate communication forms. Students propose action in response to a geographical challenge, taking account of environmental, economic and social factors, and predict the outcomes and consequences of their proposal.*

## YEAR 10 GEOGRAPHY ACHIEVEMENT STANDARD

*By the end of Year 10, students explain how interactions between geographical processes at different scales change the characteristics of places. Students identify, analyse and explain significant interconnections between people, places and environments and explain changes that result from these interconnections and their consequences. They predict changes in the characteristics of places and environments over time, across space and at different scales and explain the predicted consequences of change. They evaluate alternative views on a geographical challenge and alternative strategies to address this challenge using environmental, economic, political and social criteria.*

*Students use initial research to develop and modify geographically significant questions to frame an inquiry. They critically evaluate a range of primary and secondary sources to select and collect relevant, reliable and unbiased geographical information and data. Students record and represent multi-variable data in of the most appropriate digital and non-digital forms, including a range of graphs and maps that use suitable scales and comply with cartographic conventions. They use a range of methods and digital technologies to interpret and analyse maps, data and other information to make generalisations and inferences, propose explanations for significant patterns, trends, relationships and anomalies across time and space and at different scales, and predict outcomes. They analyse and synthesise data and other information to draw reasoned conclusions, taking into account alternative perspectives. Students present findings, arguments and explanations using relevant geographical terminology and graphic representations and digital technologies in a range of selected and appropriate communication forms. They evaluate their findings and propose action in response to a contemporary geographical challenge, taking account of environmental, economic, political and social considerations. They explain the predicted outcomes and consequences of their proposal.*





| CONTENT DESCRIPTIONS                                      |  | YEAR 9   |          |
|---|--|----------|----------|
| <b>Biomes and Food security</b>                           | Distribution and characteristics of biomes as regions with distinctive climates, soils, vegetation and productivity  | ACHGK060 |          |
|   | Human alteration of biomes to produce food, industrial materials and fibres, and the use of systems thinking to analyse the environmental effects of these alterations   | ACHGK061 |          |
|   | Environmental, economic and technological factors that influence crop yields in Australia and across the world   | ACHGK062 |          |
|   |  | YEAR 10  |          |
| <b>Environmental change and Management</b>                | Human-induced environmental changes that challenge sustainability  | ACHGK070 |          |
|   | The application of systems thinking to understanding the causes and likely consequences of the environmental change being investigated   | ACHGK073 |          |
|   | The application of geographical concepts and methods to the management of the environmental change being investigated  | ACHGK074 |          |
|   | The application of environmental economic and social criteria in evaluating management responses to the change   | ACHGK075 |          |
|   |  | YEAR 9   | YEAR 10  |
| <b>Observing, questioning and planning</b>                | Develop geographically significant questions and plan an inquiry that identifies and applies appropriate geographical methodologies and concepts   | ACHGS063 | ACHGS072 |
| <b>Collecting, recording, evaluating and representing</b> | Evaluate sources for their reliability, bias and usefulness and select, collect, record and organise relevant geographical data and information, using ethical protocols, from a range of appropriate primary and secondary sources  | ACHGS064 | ACHGS073 |
| <b>Interpreting, analysing and concluding</b>             | Interpret and analyse multi-variable data and other geographical information using qualitative and quantitative methods, and digital and spatial technologies as appropriate, to make generalisations and inferences, propose explanations for patterns, trends, relationships and anomalies, and predict outcomes | ACHGS067 | ACHGS076 |



| CONTENT DESCRIPTIONS                          |  | YEAR 9   | YEAR 10  |
|---|--|----------|----------|
| <b>Interpreting, analysing and concluding</b> | Apply geographical concepts to synthesise information from various sources and draw conclusions based on the analysis of data and information, taking into account alternative points of view  | ACHGS068 | ACHGS077 |
|   | Identify how geographical information systems (GIS) might be used to analyse geographical data and make predictions  | ACHGS069 | ACHGS078 |
| <b>Communicating</b>                          | Present findings, arguments and explanations in a range of appropriate communication forms, selected for their effectiveness and to suit audience and purpose; using relevant geographical terminology, and digital technologies as appropriate  | ACHGS070 | ACHGS079 |
| <b>Reflecting and responding</b>              | Reflect on and evaluate findings of an inquiry to propose individual and collective action in response to a contemporary geographical challenge, taking account of environmental, economic, political and social considerations; and explain the predicted outcomes and consequences of their proposal | ACHGS071 | ACHGS080 |



# THANK YOU!



This unit of work has been brought to you by She Maps and was developed in partnership with ForestLearning. You can find out more about ForestLearning at [forestlearning.edu.au](https://forestlearning.edu.au)

We hope that you love our resources, and that you are excited for what we will release next! To see more She Maps resources check out our [Teacher resources page](#).

1300 895 785 | [hello@shemaps.com](mailto:hello@shemaps.com) | [www.shemaps.com](http://www.shemaps.com)

## WHAT DO YOU NEED?

We're always looking for recommendations for topics or themes for drone and geospatial teaching resources. If you've got something in mind, then please email

[programs@shemaps.com](mailto:programs@shemaps.com)



# AGTA Awards



## Winner 2022

Category:  
**Digital/Online Resource**

Resource:  
***Years 5-6 Drones in Forestry***  
***Years 9-10 Drones in Forestry***

Publisher:  
**ForestLearning and She Maps**

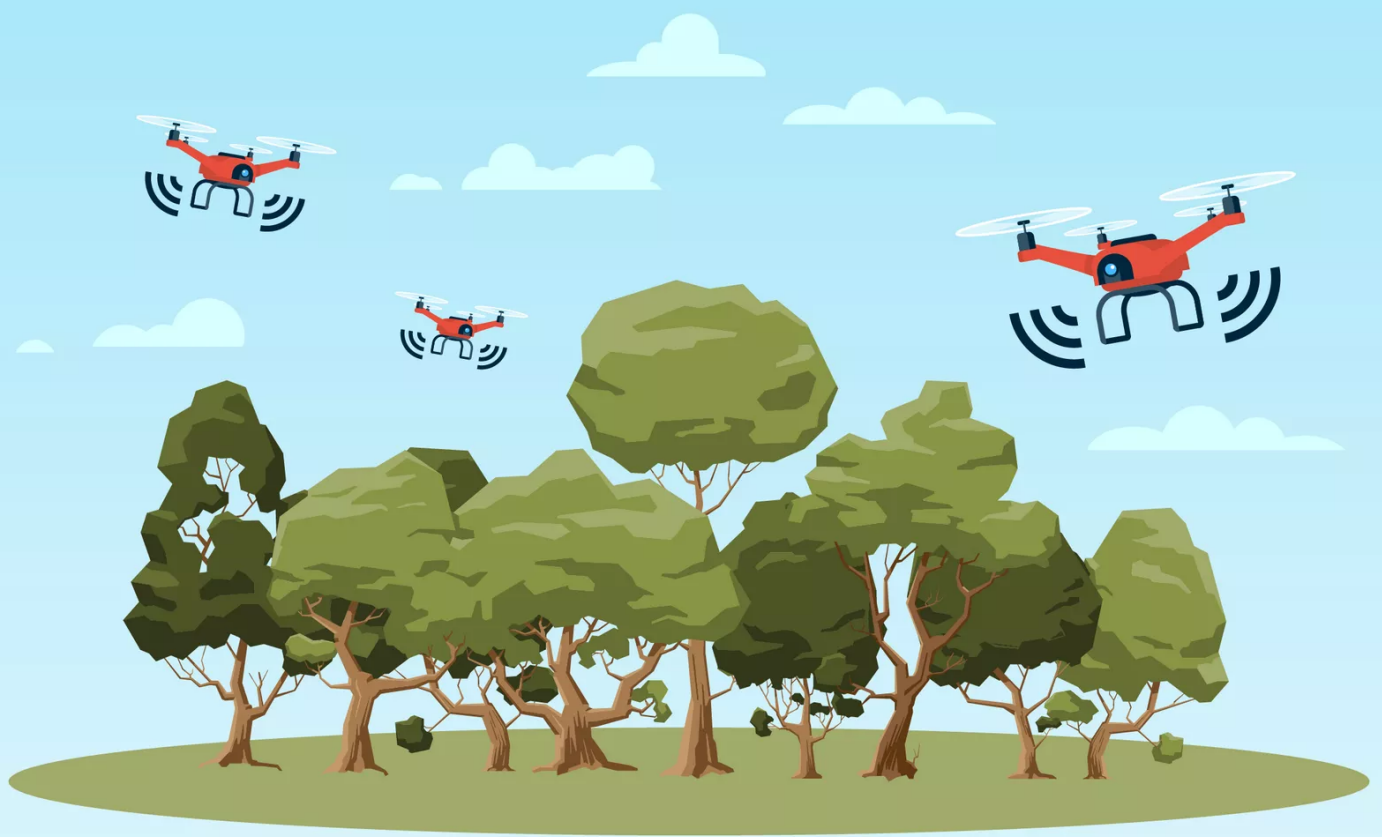
This certificate has been presented in recognition of the quality of the product in terms of its:

- ❖ currency
- ❖ authenticity
- ❖ application of contemporary understandings about how students learn
- ❖ the use of cutting-edge production, and
- ❖ contemporary and innovative style in supporting geographical education in Australian schools.

*The ForestLearning and She Maps Drones in Forestry units dynamically engage with emerging technology for a contemporary learning experience for all students. The significant support and resourcing attached to the unit empowers teachers to implement contemporary geographic tools in their curriculum, underpinned by strong vocational links.*

*Presented at the 2022 AGTA Conference, Hobart, Tasmania, September 2022*

**Dr Susan Caldis**  
Chairperson of AGTA Board



1300 895 795  
hello@shemaps.com  
www.shemaps.com