



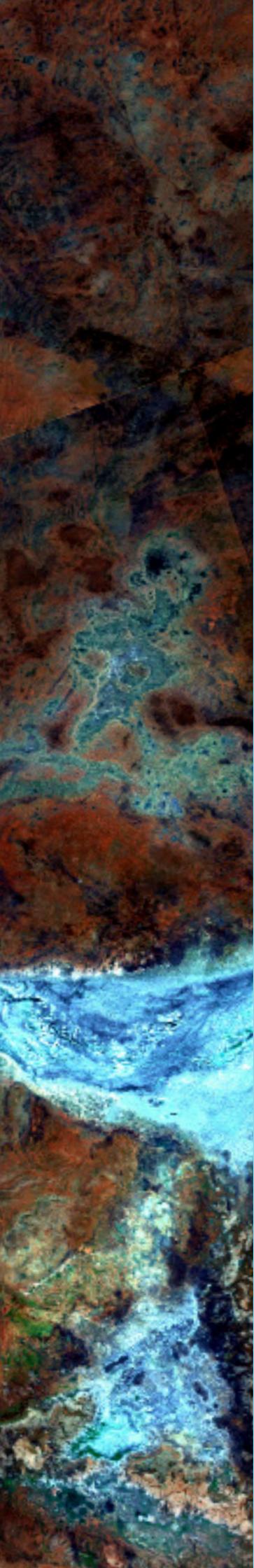
SPACE READY

THE LAUNCHPAD FOR EMERGING AGENCIES



University of
South Australia





Our mission

“An international comparison and analysis of space agencies and to provide recommendations for the benefit of emerging space states.”

Outer space, including the Moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality...

**Outer Space Treaty, 1967
Art I, Para II**

It is now widely accepted that all states can benefit from the access, exploration and utilization of space. National space programs have contributed to economic and social development through activities such as space exploration, space science, technology, and applications. National governments establish space agencies to pursue, fund, and oversee space activities in order to reap the benefits that space offers.

This document is a summary of the work completed at the International Space University's Southern Hemisphere Space Studies Program 2018 in cooperation with the University of South Australia. The team project report **Space Ready: The Launchpad for Emerging Agencies** (subsequently referred to as 'Space Ready') comprises the work of 24 professionals from nine countries. The purpose of the project was to build upon *A Roadmap for Emerging Space States (ARESS)*, the International Space University Space Studies Program's earlier team project published in 2017, in Cork, Ireland. The purpose of this subsequent team project is to develop a set of recommendations for emerging space states considering developing a space agency.

Space Ready recognizes the importance of selecting the most appropriate agency model based on individual states' needs. It aims to provide both case studies and a holistic overview of considerations relevant to the development of a national space agency. It delivers an international comparison of fourteen agencies from across the globe to provide a diverse and inclusive approach for any state striving to establish a domestic space capacity.

Justification

The recent announcement in September 2017 that Australia intends to establish its own space agency has prompted national discussions about the best way forward to achieve this goal. The establishment of an agency is a complex undertaking. **Space Ready** has combined the knowledge and lessons learned from a variety of established space agencies in one document. It serves as a guide outlining the considerations necessary for an emerging space state to independently establish an effective agency that will address its own needs and capabilities. **Space Ready** has divided these considerations into the four main themes of program *aims*, program *activities*, agency *structure* and *funding*.

Agencies examined:

Brazil
Canada
Chile
China
European Space Agency
India
Luxembourg
Malaysia
New Zealand
South Africa
Spain
United Arab Emirates
United Kingdom
United States of America



Aims

The recent announcement in September 2017 that Australia intends to establish a space agency has prompted national discussion about the best way forward to achieve this goal. The establishment of an agency is a complex undertaking. Space Ready has combined the knowledge and lessons learned from a variety of agencies in one document. It serves as a guide leading to the considerations necessary for an emerging space state to establish an effective agency that will address its own needs and capabilities.

An emerging space state should construct its agency aims to be:

- transparent;
- specifically defined with a clear intent;
- measurable in nature and publicly reported;
- consistent with national interests; and
- consistent with the United Nations Sustainable Development Goals.

An emerging space state should consider how the agency aims may be shaped by:

- social, religious, national security and political climate of the nation;
- condition of the national economy and the public perception of space spending;
- regional influences such as geography and the geopolitical environment;
- existing regional space entities and alliances;
- existing space-related organizations such as government departments, commercial industrial entities and public institutions; and
- existing commercial industrial entities and national technical capability.

Structure

It is important for emerging space states to consider the impact that organisational structure will have in the overall functioning of their agency. There are a number of possible models used by agencies including centralized and decentralized systems (Al Habsi, et al., 2017). The breakdown of departments within the agency is also important. Some common examples of departments include policy development, research, frequency allocation, education outreach, commercial engagement, and regulatory or licensing services. It is vital for agencies to choose maximise synergy (Luxembourg Space Cluster, 2017) through the selection of the most appropriate structural model for their requirements.

An emerging space state may consider structuring its new agency:

- to have a degree of legislated autonomy and flexibility in order to pursue meaningful aims in a timely and efficient manner; or
- as a unit within an existing department to perform strictly regulatory and bureaucratic functions.

An emerging space state may consider having simplified bureaucratic oversight of its new agency as this will:

- simplify future expansion or revision of scope of aims and activities;
- expedite authority approval to achieve its objectives in a meaningful time frame; and
- reduce agency vulnerability to a loss of political will towards the space industry.

An emerging space state may confer a degree of autonomy and discretionary behavior to a new agency enabling it to:

- pursue meaningful activities that might not fit within a single budgetary cycle or would be delayed while awaiting government funding approval; and
- adapt to future changes in aims or activities and remain relevant as a space operator.

An abstract painting with a central horizontal river or path in shades of green and blue, flowing through a landscape of warm, earthy tones like reds, oranges, and browns. The style is expressive and textured, with visible brushstrokes and a sense of depth and movement.

Recommendations

Funding

Funding arrangements and structures are critical to the success of a space program and the aims of a space agency. The funding of an agency dictates its scope, capacity and activities and is critical that emerging space states consider their economic capacity to commit to ongoing agency funding. States must be able to decide on the funding structure of its space agency based on the mandate of the agency, and the program it seeks to implement should be realistic and sustainable.

An emerging space state should consider the funding model of a new agency to ensure:

- frequency of budget revision balances the need for short-term and long-term planning;
- the state provides direct funding for the essential space capabilities that it wishes to develop;
- public-private partnerships are considered for the development of both new high-tech capabilities and the growth of the private sector;
- the portion of their domestic budget allocated to the agency is based on the essential programs they expect it to deliver;
- autonomy and discretionary spending will promote beneficial partnerships and collaboration; and
- financial transparency will build institutional authority and credentials and new partnerships with commercial industry.

Activities

The activities an agency initially undertakes are critical for its successful development due to several important factors and can impact the support garnered from the private and commercial sector. Changes in the activities of space agencies over the past decade can be attributed to improved collaboration between agencies and the private sector (David, 2016). Additionally, technology miniaturization, spin-in technologies from the IT sector, and advanced manufacturing methods have unveiled new possibilities for emerging agencies (Nardini, 2018).

An emerging space state should undertake space activities:

- under a regulatory, space-faring actor or hybrid model;
- consistent with the activities of other nations with similar economic, geographic or political landscapes;
- intended to establish and maintain direct commercial, governmental and inter-agency partnerships;
- engaging in commercial partnerships to maximize their technical and economic capacity;
- engaging in global partnerships to understand the intricacies of inter-agency coordination and support agency development;
- supporting new and ongoing projects, based on their specific interests or capabilities; and
- maximizing national support through the promotion of its activities via public outreach and education as a core activity.

Conclusion

Space Ready: The Launchpad for Emerging Agencies is a guidance tool intended to assist emerging space states in the establishment of a new agency. It has considered a diverse range of global entities in the formulation of the recommendations listed above. Governments planning to develop an agency should consider the interdependent roles of agency aims, structures, funding and activities to achieve the best model for their effective national capacity and goals.

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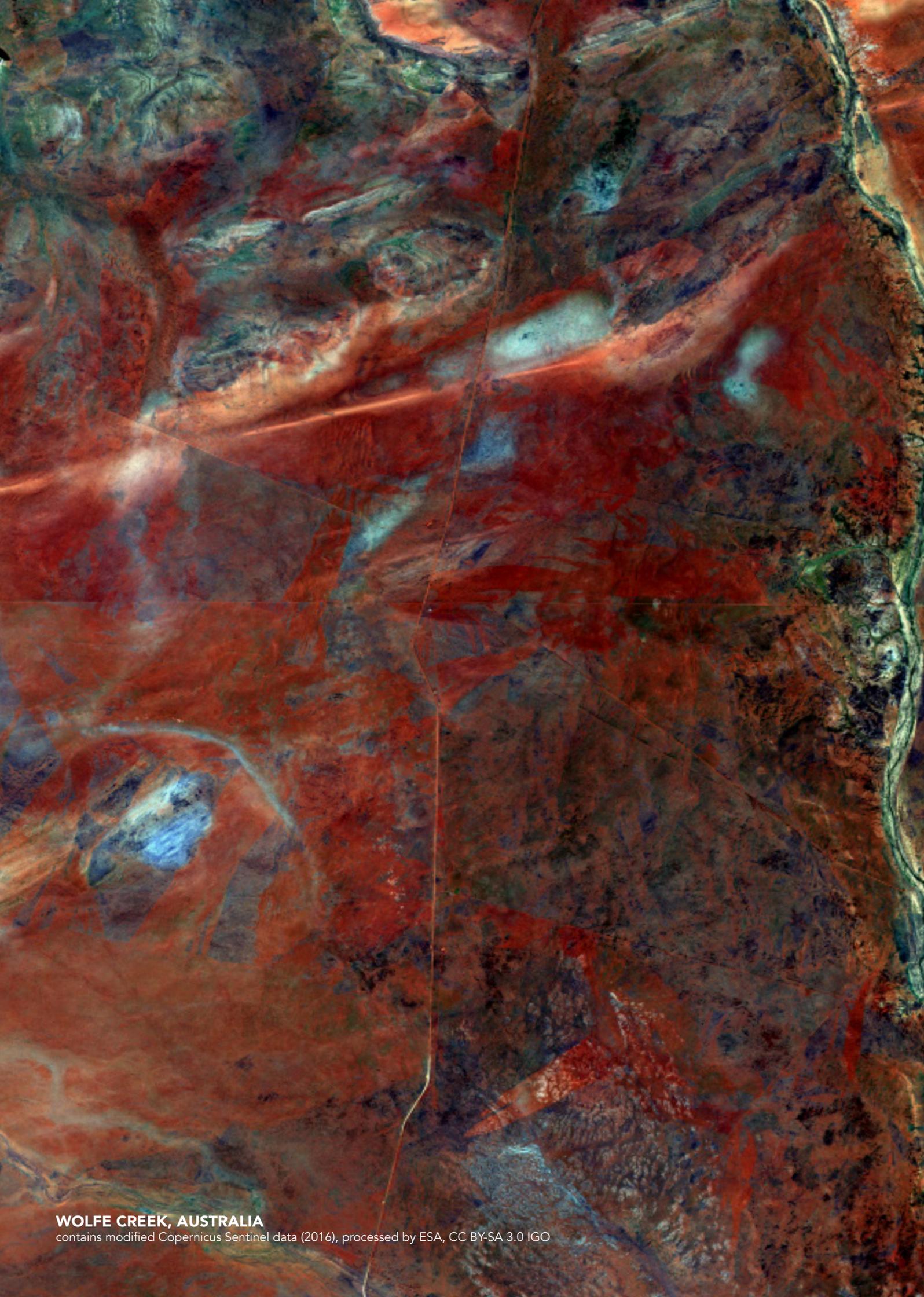
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