

# Atlas of Our Changing Environment

## A MANUAL



# ATLAS OF OUR CHANGING ENVIRONMENT

### **A MANUAL**

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#### **EXECUTIVE SUMMARY**

i
v
ix
xiii
xvii
xxi

#### **INTRODUCTION**

Purpose	1
Reference Book	1
Bringing it All Together	5
Challenges	6
Checklist	7

#### PART 1

General Guidelines – "What is Needed"	10
Production Phases	10
Required Resources	12

#### PART 2

Technical Details	.16
1. Planning	.16
2. Site Selection	.21
3. Preparation of the Images	.24
4. Adding Map Layers & Annotation	.41
Maps	.51
Ground Photos - Search and Selection	.53
References	.55
Design and Layout	.55
Cover	.57
Printing	.58

#### **APPENDIX**

Appendix A: Illustrator Style Guide	62
Appendix B: Annotation Standards	63



ATLAS OF OUR CHANGING ENVIRONMENT: A MANUAL

#### Executive Summary Introduction

This booklet is a manual for GIS and remote sensing practitioners that provide a step-by-step method for communicating the scientific findings of time-series satellite imaging studies to a wide lay audience. It is based on the lessons learned by UNEP's GRID-Sioux Falls office in helping to develop Atlases of Our Changing Environment. Their success is due to the creative use of environmental stories, satellite images, aerial photos, maps and pictures to illustrate environmental change in a clear and comprehensible way. The ultimate aim is to make the scientific evidence compelling enough to stimulate sound environmental policy-making. This manual will be especially useful in learning how to effectively use change-pair images to accurately reflect modification on the ground. Finally, it is essential for any UNEPsupported publication produced for inclusion in this series of Atlases to use these design standards and style guidelines. Below is a brief summary of the manual's contents.

The manual is comprehensive but cannot specify all the detailed steps. It is assumed the production organization and team will have some prior experience in many aspects of the process described here. These are some of the essentials:

- The production team must include skilled users of GIS software such as ESRI-ArcGIS and remote sensing software such as ERDAS Imagine.
- A very good internet connection is crucial to be able to sort through large archives of images.
- GIS Software is absolutely essential and most of the examples in this booklet require ESRI-ArcGIS.
- If the result is to be a book, writers, editors, layout persons and the necessary hardware and software are needed; these steps are not included in this guidebook.

Keep these three principles in mind throughout the process:

- 1. The images should 'tell the story'; the reader should recognize the change between image pairs and ask 'why has it changed?' not 'what has changed?'
- 2. Remote sensing images cannot communicate all types of environmental change; avoid using images that show subtle changes that readers may interpret as insignificant.
- 3. Corroborate the perceived change through narratives that complete the picture by drawing on solid published



research, government studies, alternative data, etc. Financial and time constraints generally prohibit 'groundtruthing' the changes.

The product needs an overall vision and guidance for its structure:

- *Standards and formats:* Use a set of guidelines for formatting, file types, text editing standards, map and image proportions, etc. This manual provides a prototype and the published Atlases can be referred to as models.
- Continuity and coherence: Use a template or model for a vision of the product: for example, published Atlases, a newly conceived template or guidance from a third party employed for the purpose. Be flexible in organizing the table of contents at the beginning, but once all stakeholders have been consulted, the structure should be finalized to avoid disrupting the production process.

A number of challenges will need to be overcome:

- Technical needs that might be lacking: country capacity and an enabling environment; expensive and complicated earth observation capacity; ability to fuse remote sensing and GIS, and simple user interfaces; access to broadband internet and data compression techniques; packaging and communication procedures; and policy relevant information, such as linkages with development goals.
- *Practical challenges:* the impossibility of conducting a complete scan to positively identify the most significant changes; finding policy relevant stories and proposing strategies for improvement; and integrating physical and social sciences.

A checklist is provided (pp. 7) for the project coordinator to use in steering the work during the preparatory, production and delivery stages of the process.

#### PART 1: General Guidelines – What is Needed

for the production phase, it underscores the need to obtain an ISBN and copyright clearance; to support facts and figures by authoritative references in an accepted style; to compile lists of acknowledgements, acronyms and abbreviations; to construct an index; and to finalize arrangements with a printing company. Finally, tasks during the delivery phase include proof checking and requesting high-resolution proofs from the printer.

*Required Resources*: The manual underscores the need for available funds for the whole process. The team should include a full-time project coordinator for the entire year; full-time environmental scientists, researchers and/or writers for six months; a full-time remote sensing analyst for ten months; a full-time GIS analyst/ cartographer for three to ten months; a full-time editor for one month; a full-time layout and graphics designer for three months (for a 150-page book – more time is needed for larger documents); and a part-time administrative assistant. In addition, data, imagery, hardware and software are needed; and funds for printing, shipping, correction charges, outreach material and other miscellaneous expenses. Illustrative examples of the costs associated with two published Atlases are provided.

#### PART 2: Technical Specifications – How To Do It

#### Planning

- Define the end products (print, web, powerpoint, Google Earth, book, website?) and determine the requirements for each one to make the production process efficient and minimize duplication efforts. The manual lays out these requirements through a series of images (pp. 12-14). A printed Atlas requires the most complete plan.
- The delivery date to the printer is a firm cutoff for all changes.
- Create a data directory: organize the output to track progress, back up completed work, standardize the product and access the work later on. An example of a data directory structure

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