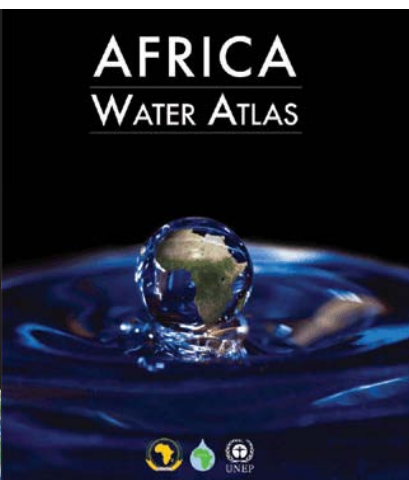
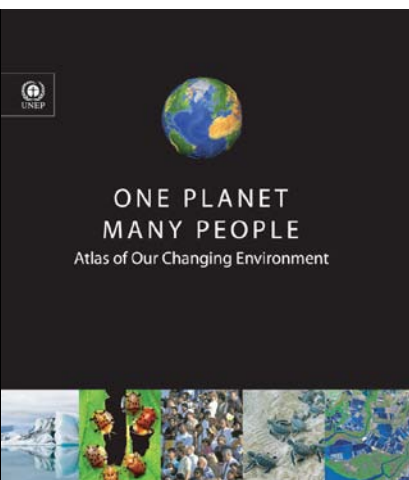




Atlas of Our Changing Environment

A MANUAL



ATLAS OF OUR CHANGING ENVIRONMENT

A MANUAL

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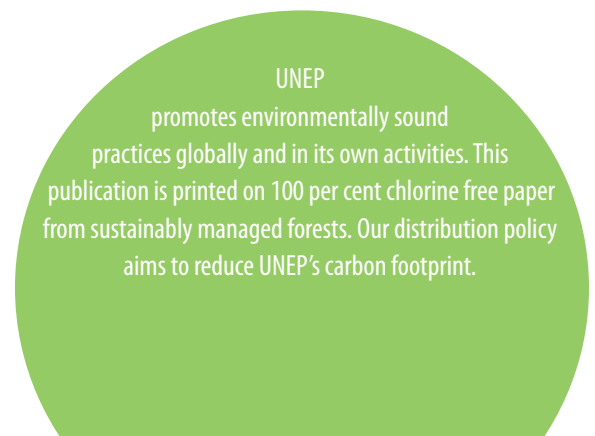
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Executive Summary

Introduction

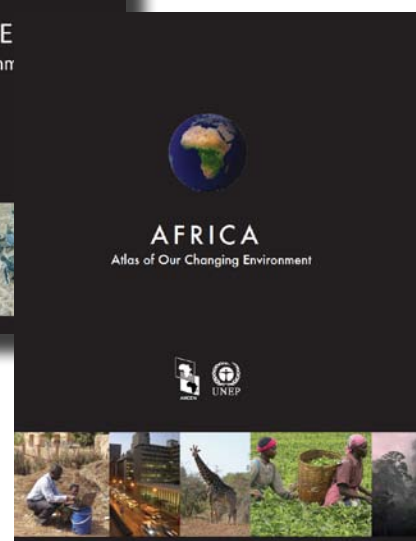
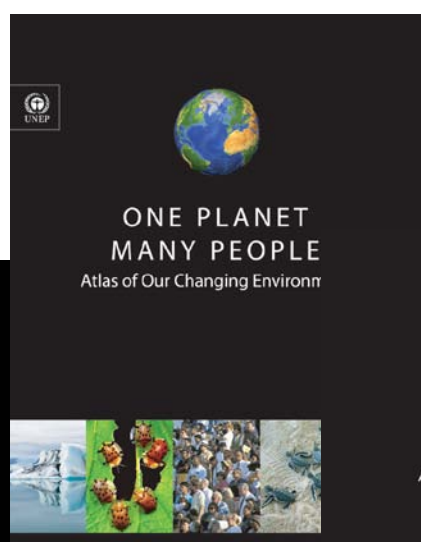
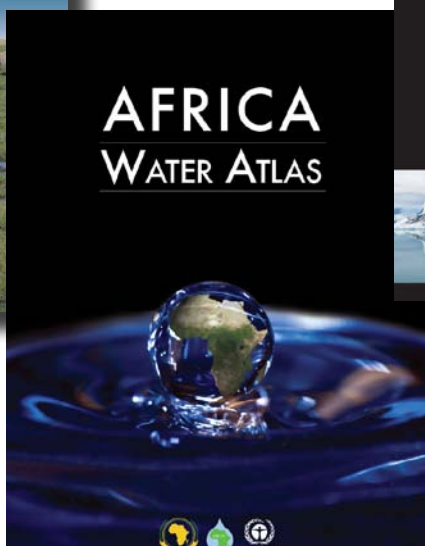
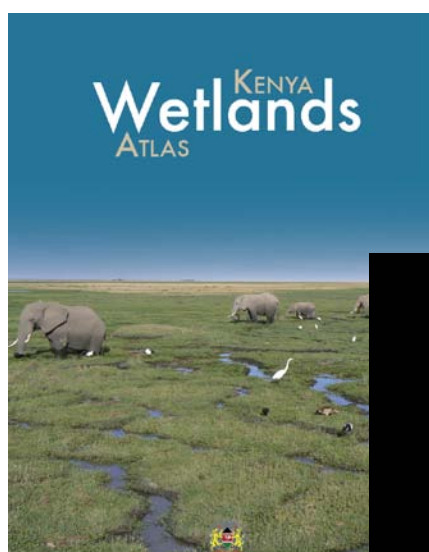
This booklet is a manual for GIS and remote sensing practitioners that provide a step-by-step method for communicating the scientific findings of time-series satellite imaging studies to a wide lay audience. It is based on the lessons learned by UNEP's GRID-Sioux Falls office in helping to develop Atlases 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 UNEP-supported 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 'ground-truthing' 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

Atlas Production Phases: In this section, the manual provides a list of the tasks associated with each of the three phases of the process, suggesting the time needed to allot to each one, allowing a minimum of one year to complete the product. To provide some instructive examples, it lists the tables of contents of three published Atlases, as well as a table showing the number of pages, words, satellite images, hotspots, ground photos and maps in each one, to illustrate the variety in content and in thematic grouping and structural organization. It notes the importance of surveying available data during the preparatory phase and using this knowledge in creating the vision and table of contents. In addition to the tasks outlined in the table

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 showing computer screen shots of typical folders and files is provided on p. 15.
- Create a set of standards to collect, organize and record GIS data as well as for the overall design, writing style, content limits, etc. The manual provides examples of mock-ups that are useful guiding tools and an Appendix includes the annotation standards guide used in producing the *Atlases of Our Changing Environment*.
- Create a set of organizing documents. The status of each example of geographical sites (change-pairs) can be tracked

in the form of a spreadsheet (example on p. 16), which allows coordinating different tasks being performed simultaneously.

Site Selection

This section suggests how to identify the geographical sites to be highlighted in the Atlas. Past experience has been based on three routes: 1. Start with a known issue of concern, then find examples of environmental change; 2. Begin with documented change in a specific place then find the imagery to support the story; 3. Discover time-series imagery at a given location, then document the evidence from the literature.

Each site identified for inclusion in the Atlas requires three elements and the tasks related to each should be undertaken in parallel: 1. Images showing evidence of change (see the manual's warning about data availability); 2. Examples of important environmental issues; 3. Supporting data and documentation from authoritative sources.

Preparing the Images

- Select the best data available and ensure the images and data have a common projection and are appropriately registered to each other.
- Select the appropriate bands for presenting the change pairs (see examples on pp. 21-23) and try to make the colours fairly intuitive for the lay audience. The manual provides the five standard applications used in the published Atlases and describes the functions they serve (p. 24).
- A process for creating a subset of an image and producing a 3-band (RGB) geotif is provided (pp. 25-28).
- Stretching the image histograms: see pp. 29-33, which include a description of how to complete the histogram stretch process in Adobe Photoshop. The purpose is to make the images more intuitive for the reader, to normalize them, to make sure the images have a similar look when displayed in Google Earth and to make the RGB to CMYK conversion for print and adjust where needed to obtain the RGB look.
- Georeference the new stretched image: this section (pp. 34-36) explains the method in ENVI and an alternative method (ArcMap), accompanied by graphics as teaching aids.

Adding Map Layers and Annotation

- *Creating map layers:* Using graphics, satellite images as examples and step-by-step instructions, this section shows how to create map layers in ArcMap (pp. 37).
- *Annotation:* It notes that Adobe Illustrator is the best application for adding quality annotation. It explains the

process that allows for maximum editing and flexibility, using screen shots from ArcMap-ArcInfo (pp. 41-47).

Maps

The manual provides criteria for including quality maps in the Atlas:

- Maps should be clear and understandable, show political borders and label major cities and geographical elements for context while remaining clear of distracting information.
- Use consistent map symbols (scale bar, legend, north arrow, etc). An Appendix provides a basic set of annotation guidelines and an ArcMap style file is available from GRID-Sioux Falls. An example map is provided.
- It is useful to create a model or example to guide map creation.
- ArcMap can save preferred symbol setting in an ESRI Style Set File.
- Request high-resolution proofs from the printer to ensure that light colours and fine lines show up and fonts are consistent and clear.

Ground Photos - Search and Selection

- Specifically appoint one person to find relevant, high resolution, large dimension photos and maintain an inventory.
- Pp. 49 list a number of important tips that should be noted.
- Instructions are provided for using non-copyrighted images from Flickr.com.

References

The UNEP Atlases commonly use the referencing style adopted for the Global Environment Outlook (GEO). This section provides instructions from the GEO style sheet (p. 51).

Design and Layout

- The manual recommends using professional design software such as Adobe InDesign or Quark Express, Adobe Photoshop, Adobe Illustrator and Adobe Acrobat Professional.
- Schedule about one month with a full-time designer for every 50 pages of a book-style Atlas.
- Guidelines are provided on pp. 51-52, including a list of UNEP criteria, an example disclaimer and criteria for a cover page with an example.

Printing

- Contact the printers for quotes about three months before the delivery date for the product's launch.

- Printing will take around two months (including shipping) after the finished Atlas is sent.
- High-quality PDFs of the completed publication are preferred.
- A Bid Annex must be prepared with specifications provided in the manual (pp. 72-73).
- Recommendations for selecting a printer are provided along with a list of those used by UNEP.
- Share electronic data with the printer
- Onsite proof checking is advisable. Other recommendations for this final step should be noted.

Launch

The manual makes some suggestions about how to ensure a successful launch, including tips about suitable presentations, promotional material, outreach efforts, venues, etc.

APPENDIX

Appendix A is the Illustrator Style Guide and Appendix B provides the Annotation Standards, as referred to in the text.



Resumen Ejecutivo

Introducción

Este folleto provee a los practicantes de SIG y teledetección un método paso a paso para la comunicación de los resultados científicos de estudios de series de tiempo por medio de imágenes, para un público no especializado. El folleto se basa en las lecciones aprendidas de la oficina GRID-Sioux Falls del PNUMA durante el desarrollo de los diferentes "Atlas de un Ambiente en Transformación" (Atlases of Our Changing Environment), en inglés. El éxito de estos atlas se debe al uso creativo de historias ambientales, imágenes satelitales, fotografías aéreas, mapas y otras fotografías que ilustran los cambios ambientales de una manera clara y comprensible. El objetivo final es mostrar evidencia científica, lo suficientemente persuasiva, que permita estimular la formulación de políticas ambientales sólidas. Este manual será especialmente útil para aprender a utilizar eficazmente pares de imágenes de cambio que reflejen con precisión la modificación de la superficie de la tierra. Por último, utilizar las presentes normas de diseño y guías de estilo, en cualquier publicación apoyada por el PNUMA y que sea incorporada en esta serie de atlas. A continuación, se muestra un breve resumen del contenido de este manual.

El manual es amplio, pero no especifica todos los pasos detalladamente. Se asume que la organización y el equipo de producción tendrán alguna experiencia previa en muchos de los aspectos del proceso descritos aquí. Estos son algunos de los detalles más esenciales:

- El equipo de producción debe incluir a usuarios expertos en herramientas de SIG, tal como ArcGIS de ESRI, y herramientas de teledetección, tal como ERDAS Imagine.
- Una muy buena conexión a Internet es crucial para poder seleccionar grandes archivos de imágenes.
- Una herramienta de SIG es absolutamente esencial y la mayoría de los ejemplos en este manual requieren de ArcGIS de ESRI.
- Si el resultado es un libro, se deben seleccionar escritores, editores, diseñadores, así como hardware y software son necesarios; para el desarrollo de una publicación; estos pasos no están incluidos en esta guía.

Mantenga presente estos tres principios durante todo el proceso:

1. Las imágenes deben 'contar la historia'; el lector debe reconocer el cambio entre los pares de imágenes y preguntar "¿por qué ha cambiado esto?", no, "¿qué ha cambiado?".



2. Las Imágenes satelitales no pueden comunicar todos los tipos de cambio ambientales; evite el uso de imágenes que muestren cambios imperceptibles donde los lectores pueden interpretarlos como insignificantes.
3. Corrobore el cambio percibido a través de relatos que completen la imagen usando datos de investigación sólida y publicada, estudios gubernamentales, datos alternativos, etc. Las limitaciones financieras y de tiempo generalmente no permiten verificaciones in situ de los cambios.

El producto necesita una visión global y orientación para su estructura:

- *Estándares y formatos:* Use un conjunto de guías para formato, tipos de archivos, normas de edición de texto, proporciones de mapas e imágenes, etc. Este manual suministra un prototipo y los atlas publicados pueden usarse como modelos.
- *Continuidad y coherencia:* Utilice una plantilla o modelo para una visión del producto; por ejemplo, los atlas publicados, una plantilla recién creada u orientación de un experto contratado para tal fin. Sea flexible en la organización de la tabla de contenido al principio, pero una vez que se haya consultado con las personas interesadas, la estructura debe ser finalizada para evitar interrupciones durante el proceso de producción.

Diferentes desafíos tendrán que ser superados:

- *Necesidades técnicas que pueden ser carentes:* la capacidad de los países y un entorno propicio; una costosa y complicada capacidad de observación de la tierra, habilidad para fusionar la teledetección y los SIG, e interfaces de usuario sencillas; acceso a internet de banda ancha y técnicas de compresión de datos; procedimientos de empaquetado y de comunicación; y política de información relevante, tal como los vínculos con las metas de desarrollo.
- *Retos prácticos:* imposibilidad de llevar a cabo un análisis completo para identificar positivamente los cambios más significativos, encontrando historias relevantes de política y proponiendo estrategias de mejoramiento; e integración de ciencias físicas y sociales.

Una lista de verificación es suministrada al coordinador del proyecto para usar se en la dirección del trabajo durante las etapas de preparación, producción y entrega del proceso.

Parte 1: Guías generales - Qué se necesita

Fases de producción del Atlas: En esta sección, el manual provee una lista de tareas asociadas a cada una de las tres fases del proceso, sugiriendo el tiempo necesario para cada una, permitiendo mínimo un año para completar el producto. Con el fin de dar algunos ejemplos informativos, se enumeran a continuación

las tablas de contenido de tres atlas ya publicados, así como una tabla mostrando el número de páginas, palabras, imágenes satelitales, áreas críticas (hotspots), fotografías y mapas en cada uno, las cuales ilustran la variedad en contenido y en agrupación temática y organización estructural. Esto muestra la importancia de evaluar los datos disponibles durante la fase preparatoria y de utilizar este conocimiento para la creación de la visión y la tabla de contenidos. Además de las tareas descritas en la tabla para la fase de producción, se enfatiza en la necesidad de obtener un ISBN (International Standard Book Number, por sus siglas en inglés) y claridad sobre los derechos de autor; utilizar hechos y cifras de referencias autorizadas en un estilo aceptado; compilar listas de agradecimientos, acrónimos y abreviaturas; construir un índice; y finalizar los arreglos con una empresa de impresión. Por último, las tareas durante la fase de entrega incluyen revisión editorial y de diseño y solicitud de pruebas de impresión de alta resolución o prueba de autor por parte de la empresa de impresión.

Recursos necesarios: El manual subraya la necesidad de fondos disponibles para todo el proceso. El equipo de trabajo debería incluir un coordinador de proyecto de tiempo completo para todo el año; científicos ambientales, investigadores y/o escritores de tiempo completo durante seis meses; un analista de teledetección de tiempo completo durante diez meses; un analista/cartógrafo de SIG de tiempo completo por tres a diez meses; un editor de tiempo completo durante un mes; un diseñador gráfico de tiempo completo por tres meses (para un libro de 150 páginas - para documentos más grandes se requiere de más tiempo; y un asistente administrativo de tiempo parcial. Además, se necesitan datos, imágenes, software y hardware; y financiamiento para impresión, distribución, cargos por corrección, material de divulgación y otros gastos varios. Se proporcionan ejemplos ilustrativos de los costos asociados a dos atlas ya publicados.

Parte 2: Especificaciones técnicas - Cómo hacerlo

Planificación

- Definir los productos finales (impresión, web, powerpoint, Google Earth, libro, sitio web?) y determinar los requisitos de cada uno para, hacer el proceso de producción eficiente y minimizar duplicación de esfuerzos. El manual expone estos requisitos a través de una serie de imágenes. Un atlas impreso requiere del plan más completo.
- La fecha de entrega para la impresión es un límite firme para todos los cambios.
- Crear un directorio de datos: organizar el resultado para monitorear el progreso, hacer una copia de respaldo del trabajo completo, estandarizar el producto y consultar el trabajo más adelante. Se suministra un ejemplo de una

estructura de directorios de datos mostrando carpetas y archivos típicos por medio de capturas de pantalla del computador.

- Crear un conjunto de estándares para recolectar, organizar y registrar datos de SIG, así como para el diseño general, estilo de escritura, límites de contenido, etc. El manual provee ejemplos de bosquejos que son herramientas de guía útiles y un apéndice que incluye una guía de estándares de anotación utilizada en la producción de los diferentes Atlas de Nuestro Medio Ambiente en Transformación (Atlases of Our Changing Environment).
- Crear un conjunto de documentos organizados. El estado de cada ejemplo de sitios geográficos (pares de cambio) se puede seguir en una hoja de cálculo, el cual permite la coordinación de diferentes tareas llevadas a cabo simultáneamente.

Selección del sitio

Esta sección sugiere cómo identificar los sitios geográficos a destacar en el atlas. La experiencia pasada se ha basado en tres rutas: 1. Comenzar con un problema conocido que sea de preocupación, y luego encontrar ejemplos de cambio ambiental; 2. Iniciar con el cambio documentado en un lugar específico y después encontrar imágenes que apoyen la historia; 3. Descubrir imágenes de series de tiempo en un lugar determinado, y luego documentar la evidencia por medio de literatura.

Cada sitio identificado que se quiera incorporar en el atlas requiere de tres elementos y tareas relacionadas, cada uno de los cuales debe realizarse en paralelo: 1. Imágenes mostrando evidencia del cambio (véase la advertencia del manual acerca de disponibilidad de datos); 2. Ejemplos de temas ambientales importantes; 3. Soporte de los datos y la documentación por medio de fuentes autorizadas.

Preparación de las imágenes

- Seleccione los mejores datos disponibles y asegúrese de que las imágenes y los datos tienen una proyección común y que estén debidamente registrados entre sí.
- Seleccione las bandas apropiadas para presentar los pares de cambio y trate de hacer que los colores sean bastante intuitivos para el público no especializado. El manual suministra cinco aplicaciones estándares utilizadas en los atlas publicados y describe las funciones ejercidas.
- Se proporciona un procedimiento para seleccionar un área específica en una imagen y producir un archivo en formato GeoTIF de 3 bandas (RGB).
- Ecuilibrar los histogramas de las imágenes, se incluye una descripción de cómo completar el proceso de ecualización del histograma en Adobe Photoshop. El objetivo es

hacer que las imágenes sean más intuitivas para el lector, normalizándolas, para asegurarse de que las imágenes tengan una apariencia similar a la que aparece en Google Earth y para hacer la conversión de RGB a CMYK para impresión, así como para ajustar cuando sea necesario obtener la apariencia RGB.

- Georreferenciar la imagen normalizada: esta sección explica el método en ENVI y un método alternativo (ArcMap), acompañado de gráficos como ayudas de enseñanza.

Adición de capas de mapa y anotación

- *Creación de capas de mapa:* En esta sección se muestra cómo crear capas de mapa en ArcMap usando gráficos e imágenes satelitales como ejemplo y dando instrucciones paso a paso.
- *Anotación:* Considere que Adobe Illustrator es la mejor aplicación para añadir anotaciones de calidad. En esta sección se explica el proceso que permite la máxima flexibilidad y edición, por medio de capturas de pantalla de ArcMap-ArcInfo.

Mapas

El manual proporciona criterios para incluir mapas de calidad en el atlas:

- Los mapas deben ser claros y comprensibles, mostrando límites políticos y etiquetas de las principales ciudades y elementos geográficos como contexto. Así, el mapa es claro y se eliminan elementos que distraigan la interpretación.
- Utilice símbolos que sean consistentes en el mapa (barra de escala, leyenda, flecha apuntando al norte, etc.). Un apéndice ofrece un conjunto básico de guías de anotación y un archivo de estilo de ArcMap suministrado por GRID-Sioux Falls. Se provee un ejemplo de mapa.
- Es útil crear un modelo o ejemplo para guiar la creación del mapa.
- ArcMap puede guardar ajustes de simbología preferidos en un archivo de conjunto de estilos de ESRI.
- Para asegurarse de que los colores claros y las líneas finas se destacan en los mapas y que los tipos de letras sean coherentes y claros, se debe solicitar pruebas de alta resolución a la imprenta.

Fotografía - Búsqueda y selección

- Asigne específicamente a una persona para encontrar imágenes de alta resolución y amplia dimensión, y mantener un inventario.
- En las páginas 64-65 se enumeran una serie de consejos importantes que deben ser destacados.

- Se suministran instrucciones para el uso de imágenes sin derechos de autor desde Flickr.com.

Referencias

Los diferentes atlas del PNUMA comúnmente usan el estilo de referencia adoptado por la serie de informes “ Perspectivas del Medio Ambiente Mundial ” (Global Environment Outlook-GEO , en inglés). En esta sección se provee instrucciones de la hoja de estilo de GEO.

Diseño y maquetación

- El manual recomienda el uso de software de diseño profesional, tal como Adobe InDesign o Quark Express, Adobe Photoshop, Adobe Illustrator y Adobe Acrobat Professional.
- Planifique aproximadamente un mes con un diseñador de tiempo completo por cada 50 páginas de un atlas estilo libro.
- Se proporcionan guías, incluyendo una lista de criterios del PNUMA, un ejemplo de advertencia y criterios para diseñar una portada con un ejemplo.

Impresión

- Contacte empresas de impresión para obtener cotizaciones más o menos tres meses antes de la fecha de entrega para el lanzamiento del producto.
- La impresión tomará alrededor de dos meses (incluyendo envío) después de que los archivos finales del atlas son enviados.

- Se recomienda el uso de archivos PDFs de alta calidad de la publicación completa.

- Un apéndice con las ofertas y cotizaciones debe prepararse de acuerdo con las especificaciones establecidas en el manual.

- Se suministran recomendaciones para la selección la empresa de impresión junto con una lista de las utilizadas por el PNUMA.

- Comparta los datos electrónicos con la empresa de impresión.

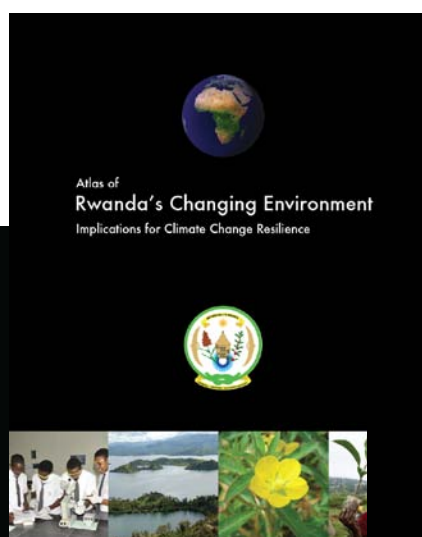
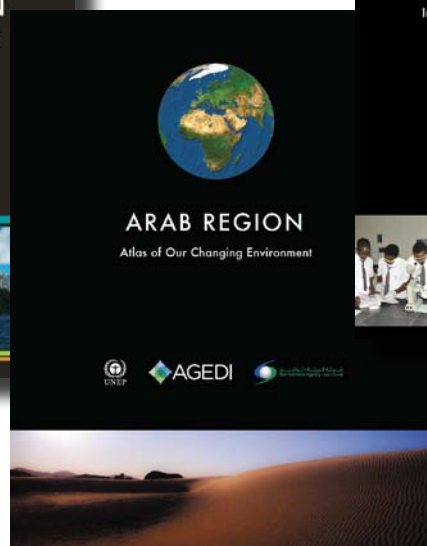
- Chequeo de prueba de las instalaciones es aconsejable. Otras recomendaciones para este paso final deben tenerse en cuenta.

Lanzamiento

El manual da algunas sugerencias sobre cómo asegurar un lanzamiento exitoso, incluyendo consejos sobre presentaciones adecuadas, material promocional, actividades de divulgación, lugares, etc.

APENDICE

El Apéndice A es la Guía de Estilo de Illustrator y el Apéndice B provee Estándares de Anotación, como se indica en el texto.



Résumé

Introduction

Ce manuel fournit aux spécialistes des SIG et de la télédétection, une méthode pas à pas pour communiquer à un large public les résultats d'études scientifiques de séries chronologiques d'images satellites. Cette méthode est basée sur les enseignements tirés par le bureau du PNUE-GRID-Sioux Falls, lors du développement des « Atlas de notre environnement en mutation ». Leur succès est dû à l'utilisation créative de faits environnementaux, d'images satellites, de photographies aériennes, de cartes et d'autres clichés divers pour illustrer le changement de l'environnement d'une manière claire et compréhensible. L'ultime objectif est de rendre les preuves scientifiques suffisamment convaincantes pour motiver l'élaboration de solides politiques de protection de l'environnement. Ce manuel sera particulièrement utile pour apprendre à utiliser efficacement les paires d'images qui comparent des états avant-après pour refléter précisément les modifications sur le terrain. Finalement, il est essentiel pour n'importe quelle publication du PNUE produite pour être incluse dans cette série d'Atlas, d'utiliser ces normes de conception et ces guides de styles. Ci-dessous, un bref résumé du contenu de ce manuel.

Cette brochure est aussi complète que possible mais ne peut pas décrire toutes les étapes en détails. Il est donc supposé que l'organisation et l'équipe de production ont une expérience préalable dans de nombreux aspects du processus décrit ci-dessous. Voici quelques-uns des éléments essentiels :

- L'équipe de production doit inclure des personnes familières dans l'utilisation des logiciels SIG, tels qu'ESRI-ArcGIS, et des logiciels de télédétection, comme ERDAS Imagine.
- Une très bonne connexion internet est essentielle pour pouvoir trier d'importantes archives d'images.
- Un logiciel de SIG est absolument obligatoire, et la plupart des exemples de ce manuel requièrent le logiciel ESRI-ArcGIS.
- Si un livre est prévu comme résultat final, les auteurs, éditeurs, personnes s'occupant de la mise en page, ainsi que le matériel et les logiciels nécessaires doivent être prévus. Ces étapes ne sont pas décrites dans ce manuel.

Ces trois principes doivent être gardés à l'esprit tout au long du processus:

11. Les images doivent « raconter l'histoire ». Le lecteur doit pouvoir reconnaître les changements entre les images et



se demander « pourquoi y a-t-il eu ce changement ? », et non pas « qu'est-ce qui a changé ? ».

2. Les images de télédétection ne peuvent pas représenter tous les types de changements environnementaux; il faut donc éviter d'utiliser des images qui montrent des changements subtils que les lecteurs pourraient interpréter comme insignifiant.
3. Corroborer le changement perçu par des écrits qui complètent l'image en s'appuyant sur de sérieuses publications, des études gouvernementales, d'autres données, etc. Les contraintes temporelles et financières n'autorisent généralement pas la « vérification sur le terrain » des changements.

Le produit final a besoin d'une vision et d'une orientation globale pour sa structure :

- *Normes et formats*: Utiliser un ensemble de règles pour la mise en forme, les types de fichiers, les normes d'édition de texte, les proportions des cartes et images, etc. Ce manuel fournit un prototype et les Atlas déjà publiés peuvent être utilisés comme modèles.
- *Continuité et cohérence*: Utiliser un modèle pour une vision du produit, par exemple, des Atlas déjà publiés, un modèle nouvellement conçu, ou les conseils d'un tiers employé spécifiquement pour ce travail. Au début, soyez flexible dans l'organisation de la table des matières, mais une fois que toutes les parties prenantes ont été consultées, la structure doit être finalisée pour éviter de perturber le processus de production.

Un certain nombre de défis devront être surmontés :

- *Les besoins techniques qui pourraient faire défaut* : la capacité des pays et un environnement favorable, la capacité d'observation de la terre qui est chère et compliquée, la capacité à fusionner la télédétection et les SIG avec des interfaces utilisateur simples, l'accès à Internet haut débit et les techniques de compression de données, les présentations et les moyens de communication, et enfin les informations importantes sur les politiques, tels que les liens avec les objectifs de développement.
- *Les défis pratiques* : l'impossibilité de procéder à une analyse complète afin d'identifier irréfutablement les changements les plus importants, identifier les politiques appropriées et proposer des stratégies d'amélioration, et enfin intégrer les sciences physiques et sociales.

Une liste de vérification est fournie au coordinateur du projet pour qu'il l'utilise dans la conduite des travaux, pendant les étapes de préparation, production, et distribution.

PARTIE 1: Indications Générales – Ce qui est nécessaire

Phases de production de l'Atlas : Dans cette section, le manuel fournit une liste des tâches associées à chacune des trois phases du processus, et suggère le temps nécessaire à attribuer à chacune de ces phases, en prévoyant un minimum d'un an pour compléter le produit. Pour donner quelques exemples instructifs, cette section répertorie les tables des matières des trois atlas déjà publiés, ainsi qu'un tableau indiquant le nombre de pages, mots, images satellites, zones spécifiques, photos au sol, et cartes de chacun, pour illustrer la variété de contenu, de thèmes, et d'organisation structurelle. Cette section souligne l'importance de s'informer des données disponibles au cours de la phase préparatoire et d'utiliser ces informations dans la définition de l'orientation du rapport et de la table des matières. En plus des tâches décrites dans le tableau de la phase de production, cette section souligne la nécessité d'obtenir un numéro ISBN et l'affranchissement des droits d'auteur, de justifier les faits et les chiffres par des documents de référence faisant autorité dans un style accepté, d'établir des listes de remerciements, acronymes et abréviations, de construire un répertoire, et de finaliser les accords avec une société d'impression. Enfin, les tâches à accomplir pendant la phase de distribution comprennent la vérification des épreuves, ainsi que la demande de celles-ci en haute résolution à l'imprimeur.

Ressources requises: Le manuel souligne la nécessité d'avoir des fonds disponibles pour l'ensemble du processus. L'équipe devrait comprendre un coordinateur de projet à temps plein pour toute l'année, des environnementalistes à temps plein, des chercheurs et/ou auteurs pour six mois, un analyste télédétection à temps plein pendant dix mois, un analyste SIG ou cartographe à temps plein pour trois à dix mois, un éditeur à temps plein pour un mois, un graphiste qui fera la mise en page à temps plein pendant trois mois (pour un livre de 150 pages - plus de temps est nécessaire pour des documents plus volumineux), et un assistant administratif à temps partiel. De plus, des données, images, matériels et logiciels sont nécessaires, ainsi que des fonds pour l'impression, l'envoi, les frais de correction, les documents de sensibilisation, et les autres dépenses diverses. Des exemples qui illustrent les coûts associés à la publication de deux atlas sont fournis.

PARTIE 2: Spécifications Techniques – Comment faire

Planification

- Définir les produits finaux (médias écrits, web, PowerPoint, Google Earth, livre, site internet ?) et déterminer les exigences pour chacun d'entre eux afin de rendre le processus de production efficace et d'éviter les doubles emplois. Le manuel énonce ces exigences à travers une série d'images. Un Atlas imprimé nécessite la planification la plus complète.
- La date d'envoi à l'imprimeur est la limite inflexible pour tous les changements.
- Créer un répertoire de données: organiser les résultats du projet pour pouvoir suivre les avancées, sauvegarder le travail accompli, normaliser les résultats pour pouvoir accéder au travail plus tard. Un exemple d'une structure de répertoire de données montrant des captures d'écran d'ordinateur de dossiers et fichiers typiques est fourni.
- Créer un ensemble de normes pour collecter, organiser, et enregistrer les données SIG ainsi que pour la conception en générale, le style d'écriture, les limites de contenu, etc. Ce manuel donne des exemples de maquettes qui sont des outils utiles à utiliser comme guide, et une annexe qui comprend le guide des normes d'annotation utilisées lors de la production des « Atlas de notre environnement en mutation ».
- Créer un ensemble de documents d'organisation. L'état de chaque site géographique pris en exemple (les paires de photographies montrant les changements avant-après) peut être suivi sous la forme d'une feuille de calcul, qui permet la coordination des différentes tâches réalisées simultanément.

Sélection des Sites

Cette section explique comment identifier les sites géographiques qui seront mis en avant dans l'Atlas. D'après les expériences passées, la sélection des sites est réalisée selon trois options : 1. Commencer avec un problème connu, et ensuite trouver des exemples de changement environnemental ; 2. Commencer avec un changement documenté dans un endroit particulier, et ensuite trouver les images pour justifier cet exemple ; 3. Découvrir une série d'images chronologiques d'un endroit donné, et ensuite documenter cet exemple avec des preuves bibliographiques.

Chaque site identifié pour être inclus dans l'Atlas nécessite trois éléments, et les tâches à accomplir pour chacun d'eux doivent être entreprises en parallèle : 1. Images montrant des signes de changements (voire l'avertissement décrit dans le manuel à propos de la disponibilité des données) ; 2. Exemples

d'importants problèmes environnementaux ; 3. Données et documents justificatifs provenant de sources fiables.

Préparer les Images

- Sélectionner les meilleures données disponibles et s'assurer que les images et données ont une projection commune et sont correctement enregistrées les unes par rapport aux autres.
- Sélectionner les bandes appropriées pour présenter les paires de photos représentant les changements, et essayer de rendre les couleurs intuitives pour un large public. Le manuel fournit les cinq applications standards utilisées dans les Atlas publiés et décrit les fonctions servies par chacune.
- La procédure pour créer un sous-ensemble d'une image et produire un GeoTIFF à 3-bandes (RVB) est fournie.
- Étirer les histogrammes de l'image. Le manuel inclut une description de la procédure d'étirement de l'histogramme dans Adobe Photoshop. Le but est de rendre les images plus intuitives pour le lecteur, de les normaliser, pour s'assurer que les images ont un aspect similaire lorsqu'elles s'affichent dans Google Earth, et de faire la conversion RVB-CMJN pour l'impression et les ajuster si nécessaire pour obtenir le rendu RVB.
- Géoréférencer la nouvelle image étirée : cette section explique la méthode dans ENVI et une méthode alternative (ArcMap), accompagnées de graphiques comme outils pédagogiques.

Ajouter des Couches Cartographiques et Annotations

- *Création de couches cartographiques*: Utilisation des graphiques et des images satellites comme exemples et utilisation des instructions étape-par-étape, cette section montre comment créer des couches de données cartographiques dans ArcMap.
- *Annotation*: Adobe Illustrator est la meilleure application pour ajouter des annotations de qualité. Le processus qui permet une édition et une flexibilité maximale est expliqué dans cette section, en utilisant des captures d'écran d'ArcMap-ArcInfo.

Cartes

Le manuel fournit les critères pour s'assurer d'inclure des cartes de qualité dans l'Atlas:

- Les cartes doivent être claires et être compréhensibles, les frontières politiques doivent être tracées, les grandes villes et les éléments géographiques doivent être indiqués pour le contexte, tout en évitant un excès d'information qui pourrait être distrayant.

- Utiliser des symboles cartographiques cohérents (barre d'échelle, légende, flèche montrant le Nord, etc.). En annexe un guide contenant un ensemble d'annotations de base est fourni, ainsi qu'un fichier de style ArcMap, mis à disposition par GRID-Sioux Falls. Un exemple de carte est aussi fourni.
- Il est utile de créer un modèle ou exemple pour guider la création de cartes.
- ArcMap peut enregistrer les options de préférence pour les symboles dans un fichier ESRI liste de styles.
- Demander les épreuves hautes résolutions à l'imprimeur pour s'assurer que les couleurs claires et les fines lignes apparaissent, ainsi que pour vérifier que les polices de caractères soient cohérentes et claires.

Photos de Terrain – Recherche et Sélection

- Nommer une personne en particulier pour trouver des photos appropriées, de haute résolution et de larges dimensions, et pour en tenir un inventaire.
- Pp.64-65 énumère une liste de conseils importants qu'il convient de noter.
- Les instructions sont fournies pour utiliser des images non-protégées par des droits d'auteur à partir de Flickr.com.

Références

Les atlas du PNUE utilisent couramment le style de référencement utilisé dans le *Global Environment Outlook - GEO* (Avenir de l'environnement mondial). Cette section fournit des instructions provenant de la feuille de style du processus Avenir de l'environnement mondial (GEO)..

Conception et Présentation

- Le manuel recommande d'utiliser des logiciels de conception professionnels comme Adobe InDesign ou Quark Express, Adobe Photoshop, Adobe Illustrator et Adobe Acrobat Professional.

- Prévoir environ un mois avec un graphiste à temps plein pour 50 pages d'un livre de type Atlas.
- Des indications sont fournies, elles incluent une liste des critères du PNUE, un exemple de clause de non-responsabilité, ainsi qu'un exemple et les critères pour une page de garde.

Impression

- Contacter des imprimeurs pour des devis environ trois mois avant la date du lancement du produit.
- L'impression prend environ deux mois (envoi inclus) après que l'Atlas fini soit envoyé.
- Des PDFs de haute qualité de la publication terminée sont préférés.
- Une annexe contenant les appels d'offres doit être préparée avec les spécifications fournies dans le manuel.
- Les recommandations pour sélectionner un imprimeur sont fournies avec une liste de ceux utilisés par le PNUE.
- Partager les données électroniques avec l'imprimeur.
- La vérification des épreuves directement chez l'imprimeur est recommandée. D'autres recommandations pour cette étape finale doivent être notées.

Lancement

Le manuel fait des recommandations sur la façon d'assurer un lancement réussi, y compris des conseils sur des présentations, matériel promotionnel, efforts de sensibilisation, lieux de réception appropriés, etc.

ANNEXE

L'annexe A est le guide des styles dans Illustrator et l'Annexe B fournit les normes d'annotation, comme mentionné dans le texte précédemment.

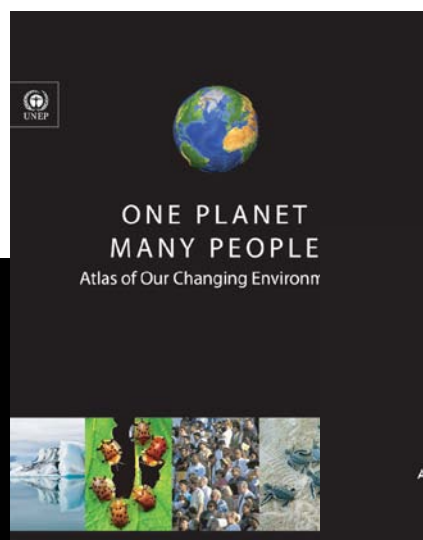
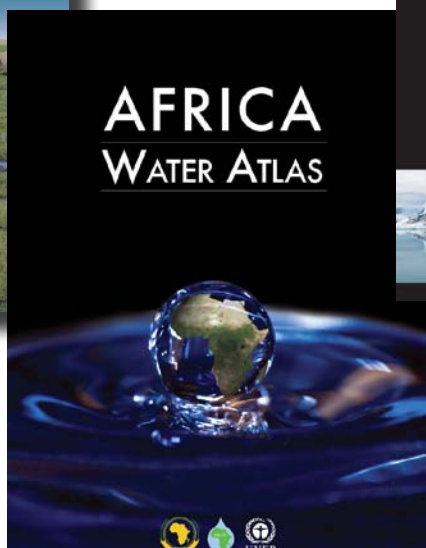
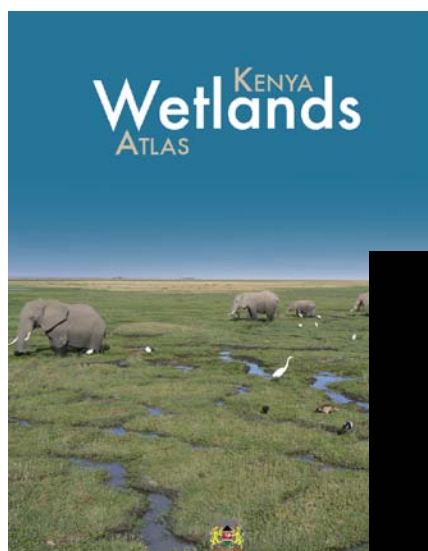
Резюме

Введение

Это руководство предоставляет ГИС и специалистам-практикам дистанционного зондирования пошаговое руководство по передаче научных результатов исследований спутниковых изображений временных рядов для широкой аудитории. Оно основано на уроках, извлеченных офисом ГРИД-Сио-Фолс ЮНЕП при оказании помощи в разработке «Атласов изменений окружающей нас среды». Их успех обусловлен творческим использованием экологических историй, спутниковых снимков, аэрофотоснимков, карт и фотографий для иллюстрации изменений окружающей среды в ясной и доступной форме. Конечной целью является сделать научные доказательства достаточно убедительными, чтобы стимулировать научно-обоснованную выработку экологических политических мер. Настоящее руководство будет особенно полезно в изучении того, как эффективно использовать парные изображения изменений для точного отражения изменений на поверхности. Наконец, для любой публикации при поддержке ЮНЕП, произведённой для включения в эту серию атласов, крайне важно использовать эти стандарты проектирования и руководящие принципы по стилю.

Руководство является всеобъемлющим, но не может указать подробно все необходимые шаги. Предполагается, что производственная организация и команда будут иметь некоторый предварительный опыт по многим аспектам описанного здесь процесса. Ниже приведены некоторые из основных требований:

- Производственная команда должна включать квалифицированных пользователей программного обеспечения ГИС, как ESRI-ArcGIS и программного обеспечения дистанционного зондирования, такого как ERDAS Imagine.
- Очень хороший доступ в интернет на большой скорости имеет решающее значение, чтобы иметь возможность разобраться в больших архивах изображений.
- Программное обеспечение ГИС является абсолютно необходимым, и большинство примеров в этой брошюре требуют ESRI-ArcGIS.
- Если результатом работы будет публикация, то необходимы писатели, редакторы, верстальщики и необходимое аппаратное и программное обеспечение; эти шаги не включены в данное руководство.



На протяжении всего процесса следует иметь в виду три принципа:

1. Изображения должны «рассказать историю»; читатель должен признать изменения между парами изображений и спросить: «почему они изменились?», а не «что изменилось?»
2. Изображения дистанционного зондирования не могут передать все виды экологических изменений; избегайте использования изображений, показывающих незначительные изменения, которые читатели могут интерпретировать как неважные.
3. Подтверждайте воспринимаемые изменения повествованием, которое завершает картину, опираясь на надёжные опубликованные исследования, государственные исследования, альтернативные данные и т.д. Финансовые и временные ограничения обычно препятствуют «наземному контролю» изменений.

Конечный продукт требует единой концепции и структуры, ниже приведены некоторые указания:

- *Стандарты и форматы:* Используйте набор руководящих принципов для форматирования, типов файлов, стандартов редактирования текста, пропорций карт и изображений, и т.д. Данное руководство содержит прототип, и опубликованные атласы могут быть использованы в качестве образца.
- *Непрерывность и последовательность:* Используйте шаблон или образец для видения продукта: например, опубликованные атласы, недавно построенный шаблон или указания от третьего лица, нанятого для этой цели. Будьте гибкими в создании оглавления в начале, но как только со всеми заинтересованными сторонами закончатся консультации, структуру следует считать окончательной, чтобы избежать нарушения производственного процесса.

Необходимо будет преодолеть ряд проблем:

- *Технические потребности, которых может не доставать:* потенциал страны и благоприятные условия; дорогостоящие и сложные мощности наблюдения Земли; способность совмещения дистанционного зондирования, и ГИС и простых пользовательских интерфейсов; доступ к широкополосному Интернету и методам сжатия данных; процедуры создания пакетов информации и связи; политическая соответствующая информация, например, связи с целями в области развития.
- *Практические проблемы:* невозможность проведения полного сканирования для точного определения

наиболее существенных изменений; трудности в поиске политически значимых историй и предложения стратегии для улучшения; интеграции физических и социальных наук.

Контрольный список (стр. 7) предназначен для координатора проекта с целью использования при руководстве работой в ходе стадий процессов подготовки, изготовления и доставки.

ЧАСТЬ 1: Общие направления – что необходимо

Этапы производства Атласа: В этом разделе руководство содержит список задач, связанных с каждой из трёх фаз процесса, с указанием времени, которое необходимо выделить каждой фазе, что позволяет минимум за год выпустить продукт. Чтобы представить некоторые поучительные примеры, в нём перечислены оглавления трёх опубликованных Атласов, а также приведена таблица, показывающая количество страниц, слов, спутниковых снимков, горячих точек, наземных фотографий и карт в каждом из них, чтобы проиллюстрировать различия по содержанию, по группировке тем и по организационной структуре. В нём отмечается важность рассмотрения имеющихся данных в ходе подготовительного этапа и использования этих знаний в создании видения и оглавления. В дополнение к задачам, изложенным в таблице для стадии производства, в нём подчеркивается необходимость получения результатов ISBN (Международный стандартный номер книги) и решение вопросов авторского права; поддержки фактов и цифр авторитетными источниками в принятом стиле; составления списков благодарностей, аббревиатур и сокращений; создание алфавитного указателя; достижения окончательных договорённостей с типографией, где применимо. Наконец, задачи на этапе доставки включают проверку доказательств и требование доказательств высокого разрешения от компании, выполняющей печать.

Необходимые ресурсы: В руководстве подчёркивается необходимость доступных средств для всего процесса. Команда должна включать координатора проекта, занятого полный рабочий день в течение всего года; ученых, исследователей и/или писателей в области окружающей среды на полный рабочий день в течение шести месяцев; аналитика дистанционного зондирования на полный рабочий день в течение десяти месяцев; аналитика ГИС/картографа на полный рабочий день на период от трёх до десяти месяцев; редактора на полный рабочий день в течение одного месяца; макетчика и графического дизайнера на полный рабочий день в течение трёх месяцев (для публикации в объёме 150 страниц – требуется больше времени для больших документов); и помощника по административным вопросам

на неполный рабочий день. Кроме того, необходимы данные, изображения, аппаратное и программное обеспечение; финансовые средства на печать, доставку, затраты на коррекцию, на пропагандистские материалы и прочие расходы. Представлены наглядные примеры затрат, связанных с двумя опубликованными Атласами.

ЧАСТЬ 2: Технические характеристики – как это сделать

Планирование

- Определить конечные продукты (печатное издание, Интернет, презентация PowerPoint, Google Планета Земля, книга, электронная книга, мультимедийные приложения, веб-сайт?) и определить требования к каждому из них, чтобы сделать процесс производства эффективным и минимизировать дублирование. Руководство выкладывает эти требования через серию изображений (стр. 12-14). Печатный Атлас требует наиболее полного плана.
- Дата отправки в печать является строгим ограничением представления всех правок и изменений.
- Создайте каталог данных: организуйте производство для отслеживания прогресса, делайте резервное копирование выполненных работ, стандартизируйте продукт и получение доступа к работе позже. Пример структуры каталога данных в виде снимков экрана компьютера с типичными папками и файлами представлен на стр. 15.
- Создайте набор стандартов по сбору, организации и записи данных ГИС, а также для общего дизайна, стилей письма, ограничений содержания и т.д. Руководство содержит примеры макетов, которые представляют собой полезные руководящие инструменты и Приложение включает аннотацию руководящих стандартов, использованных при производстве «Атласов нашей изменяющейся окружающей среды».
- Создайте набор организационных документов. Состояние каждого примера географических объектов (изменяемых пар) можно отслеживать в виде таблицы, что позволяет координировать разные задачи, выполняемые одновременно.

Выбор площадки

В этом разделе руководства показывается, как определить географические площадки для выделения в Атласе. Прошлый опыт был основан на трёх подходах: 1. Начните с известной

проблемы, затем найдите примеры изменения окружающей среды; 2. Начните с документированного изменения в конкретном месте, затем найдите визуальные образы, чтобы подтвердить изменения; 3. Откройте визуальные образы в течение времени для данного места, затем задокументируйте доказательства из научной литературы.

Каждая площадка, выбранная для включения в Атлас, требует три элемента – изображения, важные экологические проблемы, научные исследования – и задачи, связанные с каждым элементом следует выполнять параллельно:

1. Изображения, показывающие изменения (см. предупреждение данного руководства о наличии данных);
2. Примеры важных экологических проблем;
3. Подтверждающие данные и документация из авторитетных источников.

Подготовка изображений

- Выберите лучшие доступные данные и убедитесь, что все изображения и данные имеют общую проекцию и надлежащим образом зарегистрированы друг с другом.
- Выберите соответствующие диапазоны для представления изменяющихся пар (см. примеры на стр. 21-23) и попытайтесь сделать цвета интуитивно понятными для широкой аудитории. Руководство содержит пять стандартных программ, используемых в опубликованных Атласах и описывает функции, которым они служат (стр. 24).
- Предоставляется процесс создания подмножества изображения и производства 3-полосного (RGB) geotif (стр. 25-28).
- Растяжка гистограмм изображения, см. стр. 29-33, которые включают описание того, как завершить процесс растяжения гистограммы в Adobe Photoshop. Цель состоит в том, чтобы сделать изображения более интуитивно понятными для читателя, нормализовать их, чтобы убедиться, что изображения имеют одинаковый вид при отображении в Google Планета Земля и сделать преобразование RGB в CMYK, которая является более совершенной моделью цветной печати, для печати и настройки при необходимости, чтобы получить вид RGB.
- Географическая привязка нового растянутого изображения: в данном разделе (стр. 34-36) описывается метод в ENVI и альтернативный метод (Arc Map), в сопровождении графики, в качестве учебно-методического пособия.

Добавление слоёв к картам и аннотация

- Создание слоёв карты: Использование графики, спутниковых изображений в качестве примеров и пошаговых инструкций, в этом разделе показано, как создать слои карт в Arc Map (стр. 37).
- Аннотация: В разделе отмечено, что Adobe Illustrator является лучшим приложением для добавления качественной аннотации. В нём объясняется процесс, который позволяет более полно редактировать и имеет максимальную гибкость, с использованием снимков экрана из Arc Map-Arc Info (стр. 41-47).

Карты

Руководство содержит критерии для включения качественных карт в Атлас:

- Карты должны быть ясные и понятные, показывать политические границы и иметь названия крупных городов и географических элементов для контекста, оставаясь при этом чистыми от отвлекающей внимание информации.
- Используйте постоянные символы на карте (шкалу масштаба, легенду, стрелку, указывающую на север, и т.д.). Приложение предоставляет базовый набор принципов по аннотации и файл стиля Arc Map. Представлен пример карты.
- Полезно создать модель или пример для руководства созданием карты.
- В Arc Map можно сохранить настройки в файле ESRI Style Set.
- Запросите для подтверждения изображение высокого разрешения от компании, осуществляющей печать, чтобы убедиться, что светлые цвета и тонкие линии видны и шрифты последовательны и ясны.

Наземные фотографии – поиск и отбор

- Специально назначьте одного человека, чтобы он нашёл соответствующие фотографии большого размера с высоким разрешением и вёл реестр.
- На страницах 49 приведён ряд важных советов, которые следует иметь в виду.
- Приведены инструкции для использования не защищенных авторским правом изображений с Flickr.com.

Ссылки

В атласах ЮНЕП обычно используется стиль ссылок, принятый для докладов Глобальной экологической перспективы (ГЭП).

В этом разделе руководства содержатся инструкции из листа стилей ГЭП (стр. 51).

Дизайн и компоновка

- В руководстве рекомендуется использовать программное обеспечение для профессионального дизайна, такое как Adobe InDesign или Quark Express, Adobe Photoshop, Adobe Illustrator и Adobe Acrobat Professional.
- Рассчитывайте на примерно один месяц работы дизайнера с полным рабочим днём для каждых 50 страниц Атласа в стиле книги.
- На стр. 69-71 предоставлены руководства, в том числе перечень критериев ЮНЕП для проектирования и компоновки, примеры отказа от ответственности и критерии для титульного листа.

Печать

- Обратитесь к компаниям, осуществляющих печать, за коммерческими предложениями примерно за три месяца до даты запуска продукта.
- Печать займет около двух месяцев (включая доставку) после того, как отправлен законченный Атлас.
- Предпочтительны высококачественные PDF-файлы завершённой публикации.
- Должно быть подготовлено Приложение со ставками по спецификациям, представленным в руководстве.
- Рекомендации по выбору печатника предоставляются вместе со списком печатников, которые используются ЮНЕП.
- Передавайте печатнику электронные данные.
- Рекомендуется вычитка текстов на месте. Другие рекомендации для этой конечной стадии следует иметь в виду,

Запуск

В руководстве даются некоторые предложения о том, как обеспечить успешный запуск продукта, в том числе советы о подходящих презентациях, рекламных материалах, информационно-пропагандистской деятельности, местах и т.д.

ПРИЛОЖЕНИЕ

Приложение А является руководством по стилю Adobe Illustrator и Приложение В содержит стандарты аннотаций, как об этом говорится в тексте.

المخلص التنفيذي

مقدمة

يعد هذا الكتيب دليل خطوة بخطوة لممارسين نظم المعلومات الجغرافية والاستشعار عن بعد لكيفية إيصال النتائج العلمية لدراسات صور الأقمار الصناعية المتسلسلة زمنياً لقاعدة واسعة من الجمهور.

ويعتمد الدليل على الدروس المستفادة من مركز جريد يونيب سو فولز (GRID UNEP Sioux Falls) في إعداد اطالس بيئتنا المتغيرة. ويرجع نجاحه للاستخدام المبكر للقصص البيئية وصور الأقمار الصناعية والصور الجوية والخرائط والصور الفوتوغرافية لتوضيح التغيرات البيئية بطريقة واضحة وشاملة. والهدف النهائي هو جعل الدليل العلمي مقنع بما فيه الكفاية لتحفيز عملية صنع السياسات البيئية القائمة على الأدلة. هذا الدليل سيكون مفيداً بشكل خاص في تعلم كيفية الاستخدام الفعال لأزواج صور التغير لتعكس بدقة التغيرات على الأرض. أخيراً، فهو اساسى لاي مطبوعة مدعومة من قبل برنامج الامم المتحدة للبيئة (يونيبي) والتي تنتج لأدراجها في سلسلة الاطالس التي تستخدم معايير التصميم واسلوب المبادئ التوجيهية الخاصة بيونيبي.

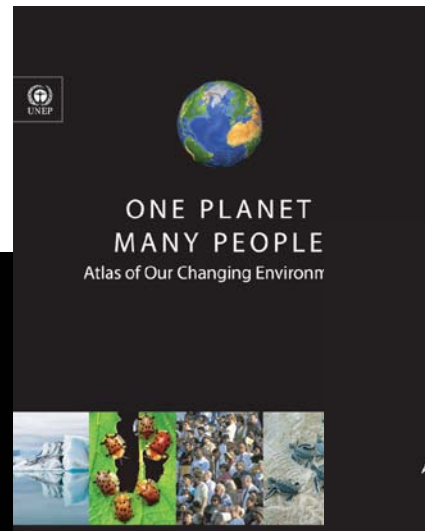
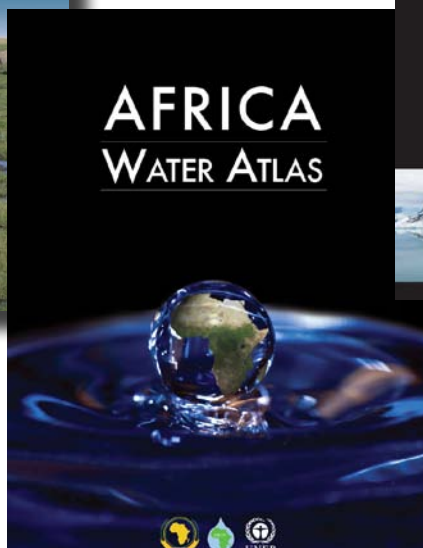
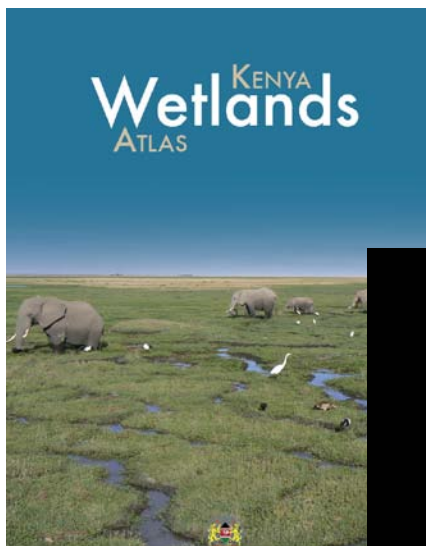
إن الدليل شامل ولكنه لا يحدد كل الخطوات التفصيلية الضرورية. انه يفترض ان المنظمة المنتجة وفريقها لديهم بعض الخبرة السابقة في العديد من جوانب العملية الموصوفة هنا. وهذه بعض من المتطلبات:

- يجب ان يتضمن فريق الانتاج مستخدمين مهرة لبرمجيات نظم المعلومات الجغرافية ESRI-ArcGIS وبرامجيات الاستشعار عن بعد مثل ERDAS Imagine.
- اتصال جيد جداً بالانترنت والذي يعد امراً حاسماً ليتمكن البحث في ارشيف ضخمة من صور الأقمار الصناعية.
- برمجيات نظم المعلومات الجغرافية أمر ضروري للغاية ومعظم الأمثلة في هذا الكتيب تتطلب نظام ESRI-ArcGIS.

إذا كانت النتيجة المطلوبة هو انتاج مطبوعه كالأطلس. فهناك احتياج لكتاب ومحررين ومصممين واجهزة وبرمجيات. هذه الخطوات ليست متضمنة في هذا الدليل.

يجب أن تبقى ثلاثة مبادئ في الاعتبار في جميع مراحل العملية:

1. ينبغي ان ان تروى الصور القصة. و ينبغي أن يتعرف القارئ على التغير بين أزواج الصور ويتسأل لماذا حدث هذا التغير.



٢. صور الأقمار الصناعية لا يمكنها إبلاغ كل أنواع التغير البيئي. لذلك تجنب استخدام الصور التي تبين تغيرات طفيفة التي قد يفسرها القارئ على أنها ضئيلة.
٣. عزز التغيرات المتصورة بالروايات التي تكمل الصورة بالاعتماد على البحوث المنشورة ذات المصادقية. الدراسات الحكومية. البيانات البديلة. الخ ... القيود المالية والزمنية قد عموما من التحقق الأرضي للتغيرات.

ان المنتج النهائي يحتاج لشكل ومظهر متسق، وفيما يلي بعض التوجيهات لهيكلة:

- المعايير والاشكال: استخدم مجموعة من المبادئ التوجيهية في الشكل. أنواع الملفات. معايير تحرير النص. نسب الخريطة والصورة. الخ ... هذا الدليل يقدم نموذج مصغر بينما الاطالس المنشورة يمكن الاشارة لها كامثلة.
- الاستمرارية والتناسك: استخدم قالب أو نموذج لعمل رؤية للمنتج. على سبيل المثال. الاطالس المنشورة تقدم قالب أو نموذج انتج حديثا من طرف ثلث يمكن استخدامه لهذا الغرض. وكون مرّن في البداية في تنظيم جدول المحتويات. ولكن بمجرد ان يتم التشاور مع جميع اصحاب المصلحة. اعتبره المحتوى النهائي لتجنب الاخلال بعملية الانتاج.

مجموعة من التحديات يجب تخطيها:

- الاحتياجات الفنية التي قد تكون ناقصة: قدرة الدولة وبيئة تمكينية. قدرة مراقبة الأرض المكلفة والمعقدة. القدرة على دمج الاستشعار عن بعد ونظم المعلومات الجغرافية. واجهات مستخدم بسيطة: الوصول إلى شبكة الانترنت عرضة النطاق وتقنيات ضغط البيانات: إجراءات التعبئة والتغليف والاتصالات: والمعلومات ذات الصلة بالسياسات. مثل الروابط مع التنمية.
- التحديات العملية: استحالة إجراء مسح كامل لتحديد إيجابي لأهم التغيرات: إيجاد قصص ذات صلة بالسياسات واقتراح استراتيجيات للتحسين: ودمج العلوم الفيزيائية والاجتماعية.

وتقدم قائمة مرجعية لمنسق المشروع لاستخدامها في توجيه العمل خلال مراحل التحضير والإنتاج والتسليم العملية.

الجزء ١: إرشادات عامة - ما هو مطلوب

مراحل إنتاج الاطلس: في هذا القسم. يوفر الدليل قائمة من المهام المرتبطة بكل مرحلة من المراحل الثلاث للعملية. مقترحا بالوقت اللازم تخصيصه لكل مرحلة. بما يسمح بسنة واحدة على الأقل لاستكمال المنتج. لتوفير بعض الأمثلة المفيدة. فهو يسرد جداول محتويات ثلاثة أطالس منشورة. فضلا عن جدول يبين عدد الصفحات والكلمات وصور الأقمار الصناعية. والنقاط الساخنة والصور الأرضية والخرائط في كل أطلس. لتوضيح التنوع في المحتوى وفي جميع المواضيع والتنظيم الهيكلي. أنها تشير إلى أهمية مسح البيانات المتاحة خلال المرحلة التحضيرية واستخدام هذه المعرفة في خلق الرؤية وجدول المحتويات.

بالإضافة إلى المهام المحددة في الجدول لمرحلة الإنتاج. فإنه يؤكد الحاجة للحصول على ISBN (الرقم الدولي المعياري للكتاب) وإزالة حقوق التأليف والنشر: ودعم الحقائق والأرقام عن طريق المراجع الموثوقة بأسلوب مقبول: وجميع قوائم الشكر والختصرات والاختصارات: لبناء فهرس: ووضع الترتيبات النهائية مع شركة الطباعة حيثما ينطبق ذلك. أخيرا. المهام خلال مرحلة التسليم وتشمل التدقيق وطلب اختبارات طباعة عالية الدقة من المطبعة.

الموارد المطلوبة: يؤكد الدليل على الحاجة إلى أموال تكون متاحة للعملية برمتها. وينبغي أن يتضمن الفريق منسق مشروع بدوام كامل لمدة سنة كاملة: وعلماء بيئة بدوام كامل. وباحثين و/أو كتاب لمدة ستة أشهر: ومحلل إستشعار عن بعد بدوام كامل لمدة عشرة أشهر: ومحلل نظم معلومات جغرافية / رسام خرائط بدوام كامل لمدة ثلاثة إلى عشرة أشهر. محرر بدوام كامل لمدة شهر واحد: مصمم ومخطط رسومات بدوام كامل لمدة ثلاثة أشهر (لمطبوعة ١٥٠ صفحة - هناك حاجة إلى مزيد من الوقت للوثائق الأكبر): ومساعد إداري بدوام جزئي. بالإضافة إلى ذلك. هناك حاجة إلى البيانات والصور والأجهزة والبرمجيات: وأموال للطباعة والشحن ورسوم التصحيح. ومواد التوعية ونفقات أخرى متنوعة. ويقدم الدليل أمثلة توضيحية من التكاليف المرتبطة باثنين من الأطالس المنشورة.

الجزء ٢: المواصفات الفنية - كيف نفعل ذلك

التخطيط

- تحديد المنتجات النهائية (الطباعة. على شبكة الإنترنت. باور بوينت. برنامج Google Earth. الكتاب. الكتب الإلكترونية. تطبيقات الوسائط المتعددة) وتحديد الاحتياجات لكل واحد لجعل عملية الإنتاج عالية ذات كفاءة وتقليل الجهود الازدواجية. يحدد الدليل هذه المتطلبات من خلال سلسلة من الصور. ويتطلب الأطلس المطبوع خطة أكثر شمولية.
- تاريخ التسليم إلى المطبعة هو حد زمني قاطع لجميع التغييرات.
- إنشاء دليل البيانات: تنظيم المنتج لتتبع التقدم المحرز. عمل نسخة احتياطية من ملفات العمل المنجز. وتوحيد المنتج والوصول إلى العمل في وقت لاحق. ونقدم مثالا على بنية دليل البيانات يظهر لقطات شاشة الكمبيوتر من مجلدات وملفات نموذجية.
- إنشاء مجموعة من المعايير لجمع وتنظيم وتسجيل بيانات نظم المعلومات الجغرافية فضلا عن التصميم العام. أسلوب الكتابة. وحدود المحتوى. وما إلى ذلك. ويقدم الدليل أمثلة لنماذج أدوات إرشادية مفيدة و يتضمن ملحق بدليل معايير التوصيف والتي تستخدم في إنتاج أطالس بيئتنا المتغيرة.
- إنشاء مجموعة من الوثائق التنظيمية. يمكن تتبع حالة كل مثال من المواقع الجغرافية (ازواج صور التغير) في شكل جداول. والذي يسمح بتنسيق المهام المختلفة التي يتم تنفيذها في وقت واحد.

اختيار الموقع

هذا القسم من الدليل يثبث إلى كيفية التعرف على المواقع الجغرافية المراد إبرازها في الأطلس. وقد استندت التجربة الماضية على ثلاثة مناهج: ١. نبدأ بقضية معينة معروفة، ثم العثور على أمثلة للتغير البيئي؛ ٢. البدء بمكان محدد ذو تغير موثق ثم العثور على صور لدعم القصة؛ ٣. استكشاف صور متسلسلة زمنياً في مكان معين، ثم توثيق الأدلة من المؤلفات العلمية.

كل موقع تم تحديده لإدراجه في الأطلس يتطلب ثلاثة عناصر - صور، والقضايا البيئية الهامة، والبحث العلمي - وينبغي الاضطلاع بالمهام المتعلقة بكل بطريقة متوازنة:

١. صور تظهر أدلة على تغير (انظر التحذير في دليل حول توافر البيانات):

٢. أمثلة على القضايا البيئية الهامة؛

٣. البيانات والوثائق الداعمة من مصادر موثوقة.

تحضير الصور

• اختيار أفضل البيانات المتاحة وضمان الصور والبيانات لديها الإسقاط الجغرافي المشترك ومسجلة جغرافياً لتتطابق مع بعضها البعض.

• تحديد الاطراف المناسبة لتقديم أزواج صور التغير ومحاولة لجعل الألوان بديهية إلى حد ما للجمهور العادي. يوفر الدليل التطبيقات الخمسة القياسية المستخدمة في الأطالس المنشورة ويصف الوظائف التي تخدمها.

• يرد في الدليل عملية إنتاج صورة جزئية من الصورة الأكبر من ثلاثة اطياف (الأحمر والأخضر والأزرق (RGB geotif).

• مد الرسوم البيانية للاضائة (histograms) لتحسين الصورة، والذي يشمل وصفاً لكيفية إتمام عملية تحسين الصورة في أدوبي فوتوشوب، والغرض من ذلك هو جعل الصور أكثر سهولة للقارئ، للتطبيق لهم، للتأكد من أن الصور لديهم نظرة مشابهة عند عرضها في برنامج Google Earth وللتحويل من نظام الأحمر-الأخضر-الأزرق (RGB) إلى نظام سماوي، أرجواني، أصفر أسود (CMYK)، والذي هو نموذج الطباعة الملونة الأكثر اسهالاً، للطباعة والضبط عند الحاجة للحصول على نظرة أحمر-أخضر-أزرق RGB.

• عمل الاحداثيات الجغرافية للصور الجديدة المحسنة ضوئياً: يشرح هذا القسم منهجية ENVI وطريقة بديلة لها (ArcMap). مرفقة برسومات كوسائل تعليمية.

إضافة طبقات الخريطة والترميز

• خلق طبقات الخريطة: باستخدام الرسوم والصور الفضائية كأمثلة مع تعليمات خطوة بخطوة، يظهر هذا القسم كيفية إنشاء طبقات الخريطة في ArcMap.

• التوصيف (Annotation): وتشير إلى أن أدوبي المصور (Adobe Illustrator) هو أفضل تطبيق لإضافة توصيف نوعي للخريطة، وتفسير للعملية التي تسمح بأقصى قدر من المرونة والتحرير، وذلك باستخدام لقطات الشاشة من ArcMap-ArcInfo.

الخرائط

يوفر الدليل المعايير لإدراج خرائط عالية الجودة في الأطلس:

• يجب أن تكون الخرائط واضحة ومفهومة، وتظهر الحدود السياسية وتسمية المدن الكبرى والعناصر الجغرافية للسباق في حين تبقى خالية من المعلومات المشتتة.

• استخدم رموزاً متسقة للخريطة (شريط مقياس الرسم، دليل الخريطة، سهم الشمال، الخ). وملحق مجموعة أساسية من المبادئ التوجيهية للتوصيف وملف نمط ArcMap. مرفق طيه خريطة كمثال.

• من المفيد خلق نموذج أو مثال يساعد في خلق الخريطة.

• يستطيع ArcMap أن يحفظ وضع الرمز المفضل في ملف باسلوب ESRI.

• أطلب بروفات طباعة عالية الدقة من المطبعة لضمان أن الألوان الخفيفة والخطوط الدقيقة تظهر والخط ثابت وواضح.

الصور الأرضية- البحث والاختيار

• تعيين شخص على وجه التحديد للبحث عن صور ذات صلة عالية التفاصيل، كبيرة الأبعاد، وعمل سجل لها.

• الصفحات ١٤-١٥ تقدم عدداً من النصائح الهامة التي ينبغي أن تلاحظ.

• مقدم إرشادات لاستخدام الصور غير محفوظة الحقوق، من Flickr.com.

المراجع

١. عادة ما تستخدم أطلاليس UNEP أسلوب المراجع المعتمدة لتقارير توقعات البيئة العالمية (GEO). هذا القسم من الدليل يوفر تعليمات من ورقة أنماط GEO.

تصميم وتخطيط

• يوصي الدليل باستخدام برمجيات التصميم المهنية مثل أدوبي إنديزين Adobe InDesign أو كوارك إكسبريس، أدوبي فوتوشوب، أدوبي المصور وأدوبي أكروبات المهني..

• جدول حوالي شهر لمصمم بدوام كامل لكل ٥٠ صفحة لكتاب على غرار الأطلس.

• يتم توفير المبادئ التوجيهية، بما في ذلك قائمة من تصاميم برنامج الأمم المتحدة للبيئة ومعايير التخطيط (layout)، ومثال تنويه ومعايير لصفحة غلاف مع مثال.

الطباعة

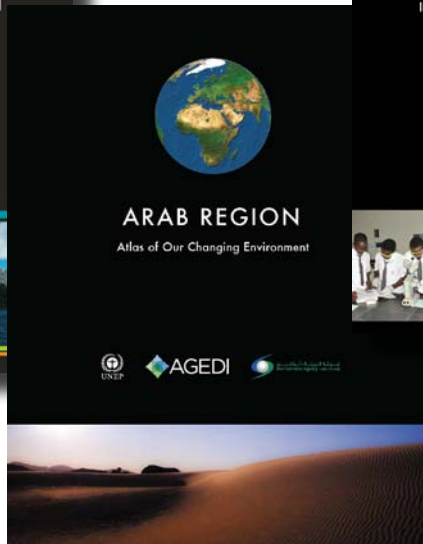
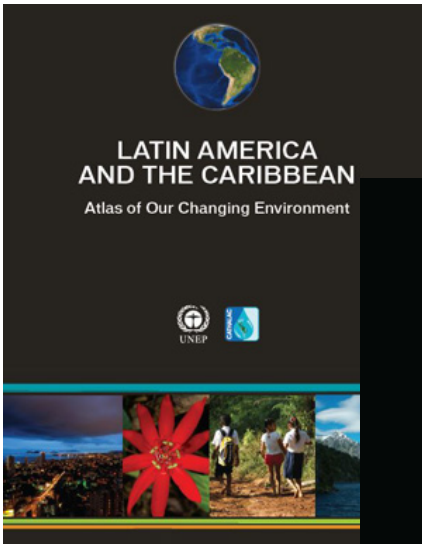
- اتصل بالمطابع لتقديم أسعار حوالى ثلاثة أشهر قبل تاريخ التسليم لإطلاق المنتج.
- سوف تستغرق الطباعة حوالى شهرين (بما في ذلك الشحن) بعد إرسال الأطلس المكمّل.
- ويفضل ملفات PDF عالية الجودة من المطبوعة المكمّلة.
- يجب اعداد مرفق المناقصة بالمواصفات المعطاه فى الدليل.
- يتم توفير توصيات لاختيار مطبعة مع قائمة من تلك المطابع التي يستخدمها برنامج الأمم المتحدة للبيئة.
- شارك البيانات الالكترونية مع المطبعة.
- من المستحسن التحقق في الموقع في عملية تدقيق الطباعة. وتجدر الإشارة إلى التوصيات الأخرى لهذه الخطوة النهائية.

الاطلاق

يقدم الدليل بعض الاقتراحات حول كيفية ضمان إطلاق منتج ناجح. بما في ذلك نصائح حول عمل عروض مناسبة، والمواد الترويجية، جهود التوعية، وأماكن الإطلاق، الخ.

الملحق

الملحق أ هو دليل نمط illustrator والملحق ب يوفر معايير توصيف الخريطة، على النحو المشار إليه في النص.



概要

介绍

本指南为地理信息系统（GIS）及遥感从业人员提供了分步骤详尽指导，以便他们能将时间序列卫星成像研究结果介绍给普通民众。本指南的编写借鉴了联合国环境规划署全球资源信息数据库苏福尔斯（GRID-Sioux Falls）办公室协助制作《环境变化图集》中获得的经验。他们的成功来源于创造性地使用环境故事、卫星影像、航拍照片、地图和照片，以清晰和易于理解的方式说明环境变化。本指南最终目的是用具有信服力的科学证据来支持以证据为基础的环境政策制定。本指南尤其对如何使用对比图像来精确的反映地面的变化有明显助益。最后，任何环境署支持的出版物，如果被纳入本系列地图册，则必须使用这些设计标准和风格指南。

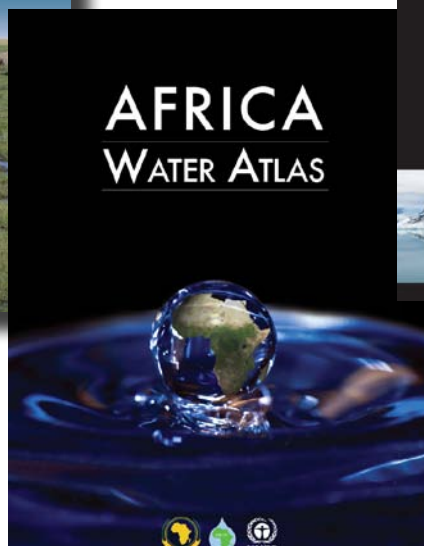
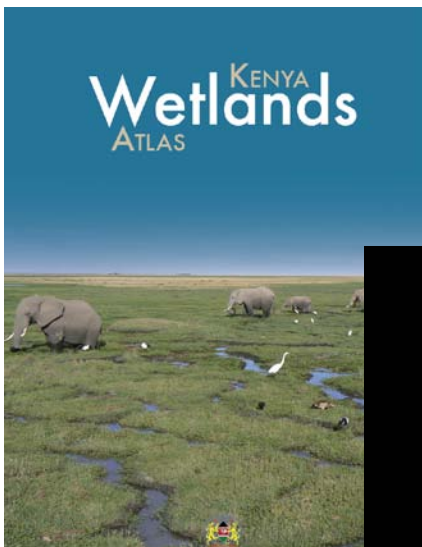
本指南涵盖方面多，但由于篇幅有限，不能一一列出所有必需的详细步骤。我们假设制作组织和团队对接下来描述的过程有一些经验。一些基本要求如下：

- 制作团队必须能够熟练操作GIS软件，如ESRI-Arc-GIS，和遥感软件，如ERDAS Imagine。

- 拥有一个很好的网络连接至关重要，以便整理大图像档案。
- 必备GIS软件，本手册许多例子都要求安装ESRI-ArcGIS。
- 但如果希望制作出版物，那么需要有作家、编辑、排版人员以及必要的硬件和软件，这些步骤本指南不包括。

整个过程中需牢记三条原则：

1. 图片应能说出故事；读者应能意识到图像对之间的变化，并提出“为什么有这样的变化”而不是“什么变化了”的问题。
2. 遥感图像不能涵盖所有类型的环境变化，应避免使用变化微小的图像，可能使读者误认为变化无关紧要。
3. 通过引用可靠的已发表研究、政府调研、替代数据等对图片进行说明补充，能使变化被更明显地感知。因为资金和时间的限制，通常无法“地面实况调查”变化。



最终的产品需要一个一致的外观与感觉，以下为对其结构的一些指导：

- **标准和格式：**使用一组指南，规定文件版式、文件类型、文本编辑格式、地图和图像比例等。本指南提供了一个样本；已出版的地图也供参考。
- **连续性和一致性：**使用模板或模型作为产品的标准：如已出版的地图册，新构想的模板，或第三方的指导。一开始，目录的组织可以相对灵活，但一旦咨询了利益相关者后，结构需最终定稿以免打乱生产过程。

需要克服的挑战：

- **可能缺乏的技术需求：**国家能力和有利环境；昂贵且复杂的地球观测能力；融合遥感和GIS的能力，用户界面简单；宽带网络和数据压缩技术；包装和通信程序；政策相关信息，如与发展目标的联系。
- **现实挑战：**不可能进行一个完整扫描来积极识别最重要的变化；发现与政策有关的故事并提出改进的策略；集成物理与社会科学。

这里提供一个核对清单，供项目协调员使用，从而安排准备、制作和交付阶段的工作。

第一部分：大纲——需要什么

图集生产阶段：在本节中，指南提供了一个三个阶段的任务清单，并提出了对完成每个阶段任务分配时间的建议，建议用至少一年的时间来完成产品。为提出一些指导性例子，本指南列出了已出版的三本地图集的目录。同时为了说明内容、主题分类和结构组织的多样性，本指南还列出了每本地图集页数、文字、卫星图像、热点地区、地面照片和地图制表。报告指出在准备阶段测量可用数据的重要性，并利用这些知识来创造图像和目录。制作阶段除了表中列出的任务，还需获得一个ISBN（国际标准书号）和版权许可；以被认可的格式引用权威来支持事实与数据；准备鸣谢、简称和缩写清单；构建索引；安排合适的印刷公司。最后，交付阶段的任务包括样图审校以及要求高分辨率打印模版及打印机。

所需资源：指南强调整个过程资金的必要性。团队需要一个全职的项目协调员，工期一年；全职的环境科学家，研究人员或作家，工期六个月；全职遥感分析人员，工期十个月；全职的GIS分析员/制图师，工期三到十个月；全职编辑，工期一个月；

全职排版及图形设计师，工期三个月（对150页出版物而言——更大的文档需时更长。）；和兼职行政助理。此外，数据，图像，必备的硬件和软件，以及用于印刷，运输，校正，宣传材料以及其它杂项支出的资金。指南提供了两本已出版地图集花销的相关例子。

第二部分：技术规格——如何做

计划

- **定义最终产品**（出版物，网络，幻灯片，谷歌地球，书籍，电子书，多媒体应用，还是网站？），并且确定每一个产品的要求，使生产过程高效化并最大限度的减少重复工作。本指南通过一系列图片指出了这些要求。一本印刷图集的制作要求最全面的计划。
- **印刷公司一旦交货，便不能再做修改。**
- **创建一个数据目录：**组织追踪项目进程，备份已完成工作，标准化产品，了解后续工作。本指南利用典型文件夹和文件的电脑截屏提供一个数据目录结构的例子。创建一套收集、组织、GIS数据记录以及整体设计、写作风格、内容限制的标准。指南提供了一图样作为有效的指导工具，附录包括在制作《环境变化图集》中使用到的注释标准指南。
- **建立一系列组织文件。**用电子表格记录每个地理位置（对比图像），从而使同时协调不同任务成为可能。

地点选择

本节内容为如何识别地图集中强调的地理位置。以往经验基于以下三种方法：

1. 以一个已关注的问题开始，然后找到环境变化的例子。
2. 找到特定地点的有记录的变化，然后找到图像证据来支持整个故事。
3. 在一个给定位置寻找发现时间序列图像，然后从科学文献中找寻证据记录。

包含在地图集中的站点需要包括三个要素——图像、重要的环境问题和科学

研究——并且与每个要素相关的任务需同时进行。

1. 图像提供变化的证据（参见指南数据可用性的警告）
2. 重要的环境问题的例子
3. 来源权威的支持数据和文件

图片准备

- 选择最好的可用数据，确保图片和数据有一致的表现且互相之间有适当的联系。
- 显示变化时，选用合适的色标，使颜色能很容易的被观众识别。指南提供了已出版地图集中的五个标准应用，并解释了它们的功能。
- 创建一个图像的子集，生成一个RGB的geo-tif文件。
- 延伸图像直方图，应该包括如何在Adobe Photoshop里完成直方图延伸过程的描述。旨在使图像更加直观、规范，并在谷歌地球里显示时，以及RGB和CMYK格式转换时看起来一致。这需要一个更精密的彩色打印模型，因为打印和调整时都需用到RGB值。
- 地理参照新的拉伸图像：这节解释了ENVI的使用方法以及替代选择（ArcMap），并使用图形作为教学工具。

添加地图层和注释：

- 创建地图层：以图像，卫星图像为例，按步骤进行指导，本节解释了如何在ArcMap中创建地图层。
- 注释：本节指出Adobe Illustrator是添加高质量注释的最佳应用软件。它允许最大编辑和灵活性，并可使用ArcMap-ArcInfo屏幕截图。

地图

指南提供了在地图集中纳入高质量地图的标准：

- 地图应该清晰易懂，保证分散信息明晰的同时又清楚显示政治边界，主要城市标记，以及上下文中的地理元素。
- 使用统一的地图符号（比例尺，图例，指北针等）。附录中提供了一组基本的注释指南和一个ArcMap样式文件，并提供了一个地图样本。
- 创建一个模型或者示例来指导地图创建是有益的。
- 要求高分辨率打印模版及打印机确保浅颜色和细线的正常显示以及字体的清晰一致。

地面照片——搜索和选择

- 特别任命一个人负责寻找相关高分辨率的大尺寸照片，并做详细记载。
- 51-52页列出了需要注意的重要建议
- 关于使用Flickr.com网上无版权图片的说明。

引用

联合国规划署地图册通常使用全球环境展望（GEO）报告的引用格式。本节提供了GEO样式表以供参考。

设计和排版

- 建议使用专业设计软件，如Adobe InDesign, Quark Express, Adobe Photoshop, Adobe Illustrator，和Adobe Acrobat Professional.
- 完成一本书籍样式的地图册的每50页，需要一名全职设计师工作大约一个月。
- 提供了联合国环境规划署设计和排版标准清单，以及免责声明和封面页标准的示例。

印刷

- 在报告发布的交货日期前三个月与印刷公司商议打印价格。
- 成品图集发送后，打印需要耗时大约两个月（包括运输）。
- 已完成的出版物首要选择高质量的PDFs版本。需按照指南中提供的规格说明准备报价附件。
- 提供选择印刷公司的建议，并附上环境署所用印刷公司名单。

- 与印刷公司共享电子数据。

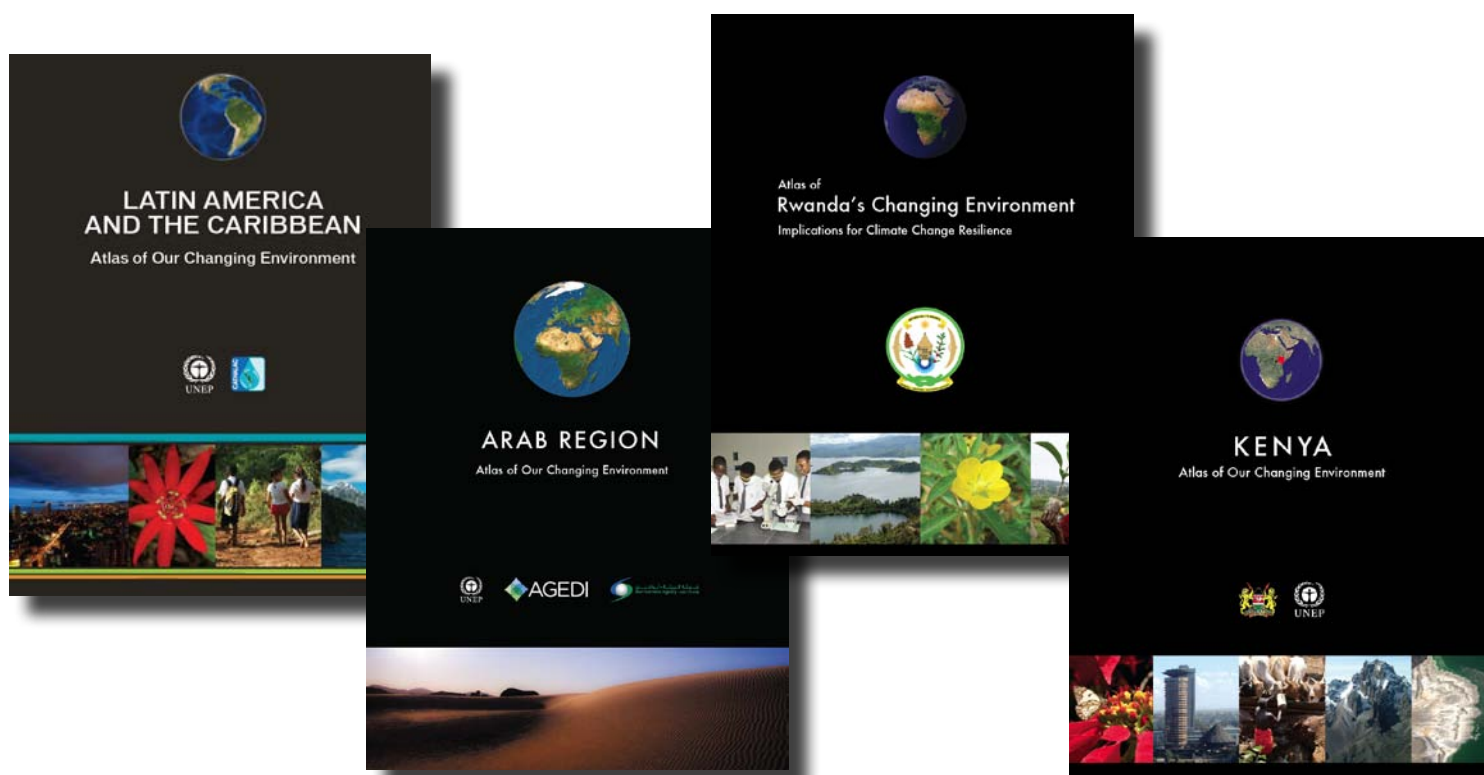
- 现场检查证据为宜。此环节最后一步的其他建议也应当被重视。

发布

指南提供了如何成功地举办报告发布会的建议，包括合适的演讲、宣传材料、宣传工作和场地等。

附录

附录A提供图像形式的指导，附录B提供注释标准，如前文所示。



PURPOSE

This booklet is aimed at the very specific purpose of teaching GIS and remote sensing professionals an effective approach to communicating the findings of environmental science to a wide variety of audiences. It is the approach that UNEP/GRID-Sioux Falls has developed during the past eight years as GRID-Sioux Falls has produced or co-produced several hardcover publications including:

One Planet, Many People, Atlas of Our Changing Environment,
Africa's Lakes, Atlas of Our Changing Environment,
Africa, Atlas of Our Changing Environment,
Kenya, Atlas of Our Changing Environment,
Uganda, Atlas of Our Changing Environment,
Africa Water Atlas,
Rwanda, Atlas of Our Changing Environment

The concept behind these publications is to use environmental stories, satellite images, aerial photographs, maps and photographs to present examples of environmental change in ways that are easily understood and compelling. Why? Because all of the environmental data in the world will not help guide sound environmental policy making if no one reads or understands it!

The booklet focuses on the identification, production and presentation of time series sets of satellite images which graphically show environmental change. In general, the individual techniques used in these Atlases are not unique. The value of this booklet is that it collects a set of techniques (together with eight years of experience in applying those techniques) into a manual which can be used to produce similar change images. Anyone wishing to produce publications similar to the ones listed above should benefit greatly from our experiences as reflected in this booklet. You might say that "we have made the mistakes so you don't have to." In addition, any publications produced for inclusion in

this series of Atlases under the support of UNEP will need to conform to many of the design standards and style guidelines outlined in this booklet.

While it is necessary to be comprehensive, it is impossible to be complete. All of these lessons are part of a process and therefore it is important to present that process from beginning to end. However, it is impossible to include all of the details of this process. It is assumed that any organisations attempting to use this booklet as a guide will have some background in remote sensing and GIS. **People skilled in the use of GIS software such as ESRI-ArcGIS and remote sensing software such as ERDAS Imagine, are a must.** This booklet and accompanying materials will give those professionals new ways of presenting remote sensing images so that they are compelling, easy to understand and scientifically sound.

A few other requirements that should be mentioned up front:

A very good internet connection is a must. To create meaningful change pairs and time series of remote sensing images you will need to be able to sort through large archives of images such as those available through USGS – EROS Data Center. Without a good internet connection, this type of work is almost impossible.

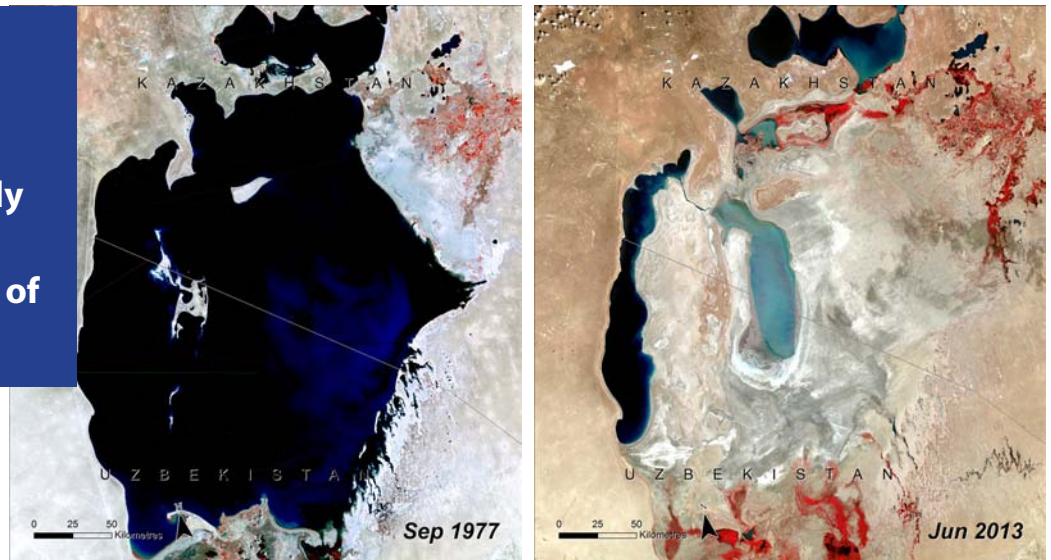
GIS Software is absolutely essential and most of the examples in this booklet are done in ESRI-ArcGIS.

In addition, **if this is to become a book, writers, editors, layout persons and the necessary hardware and software** will be required. Those roles are not unique to this type of remote sensing visualisation and so they are not addressed here.

REFERENCE BOOK

This book focuses on step by step instructions for producing remote sensing time series studies for a lay audience. This process is only useful if a few overarching principles are kept in mind at all times:

The example of the Aral Sea shown here is powerful because the reader immediately sees the change and understands the scale of that change.



A. The images should “tell the story.”

The purpose of using remote sensing images to communicate stories of environmental change is that they can quickly, intuitively and powerfully convey information to the viewer. **If an image does not tell the reader anything, then it does not serve a purpose and should not be used.**

The most successful sites that have been produced for this series of change Atlases are the ones in which the reader does not have to ask what has changed. The question we want to raise in the reader’s mind is “Why has this changed?” – not “What is the difference between these two images?”

The example of the Aral Sea shown above is powerful because the reader immediately sees the change and understands the scale of that change.

The example of the growing refugee camps in Pader District, Uganda (change pair below) is much less compelling – for several reasons. Burn scars throughout the image distract the reader from the significant change in the size of refugee camps at the center of the image. The image includes too much area where the change is not taking place rather than being cropped to just the change area. The scale of the change is too small to effectively show with medium resolution imagery.

The example of the growing refugee camps in Pader District, Uganda is much less compelling.



The change is very subtle and cannot be seen in the two images from the 1970s and early 2000s.



Early 1970s



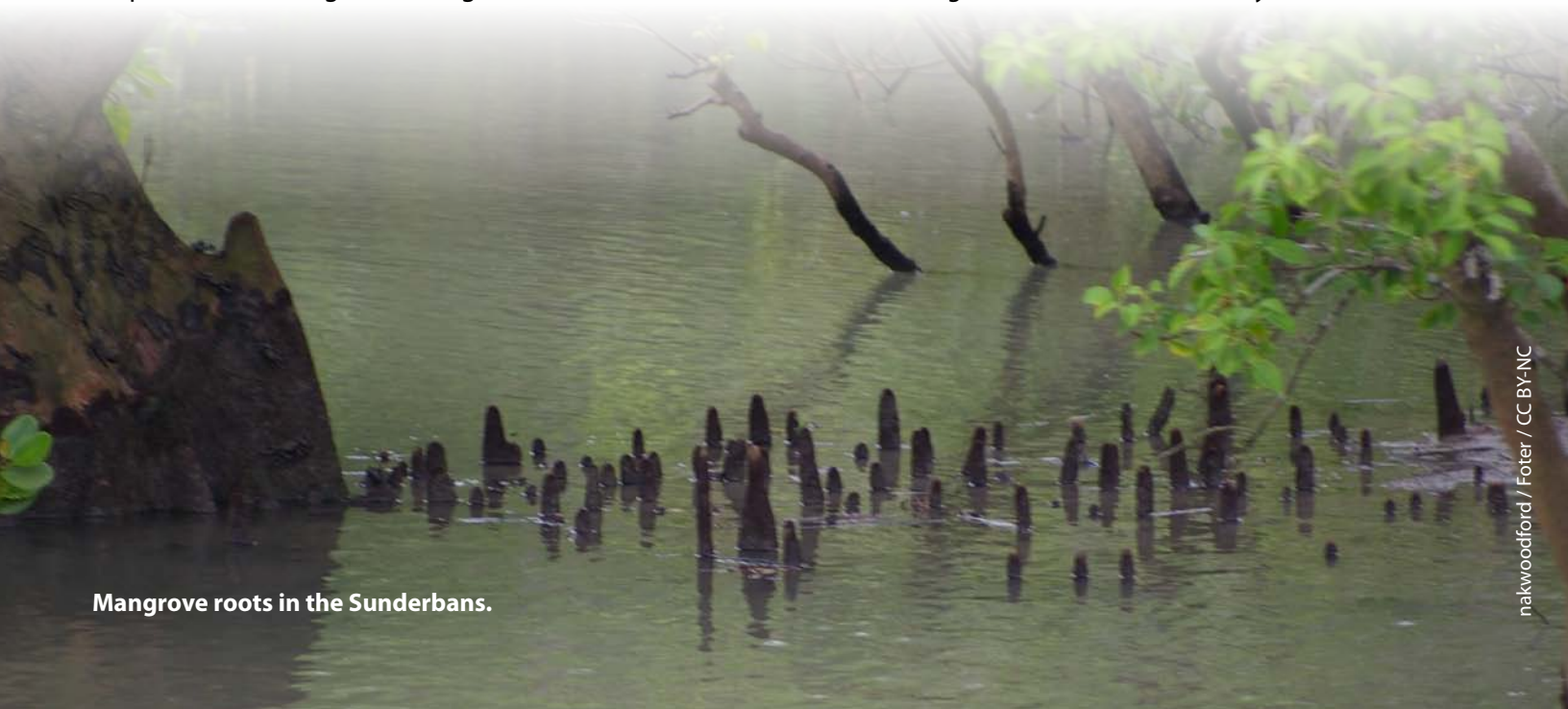
Early 2000s

B. Not all cases of environmental change can be communicated with remote sensing images.

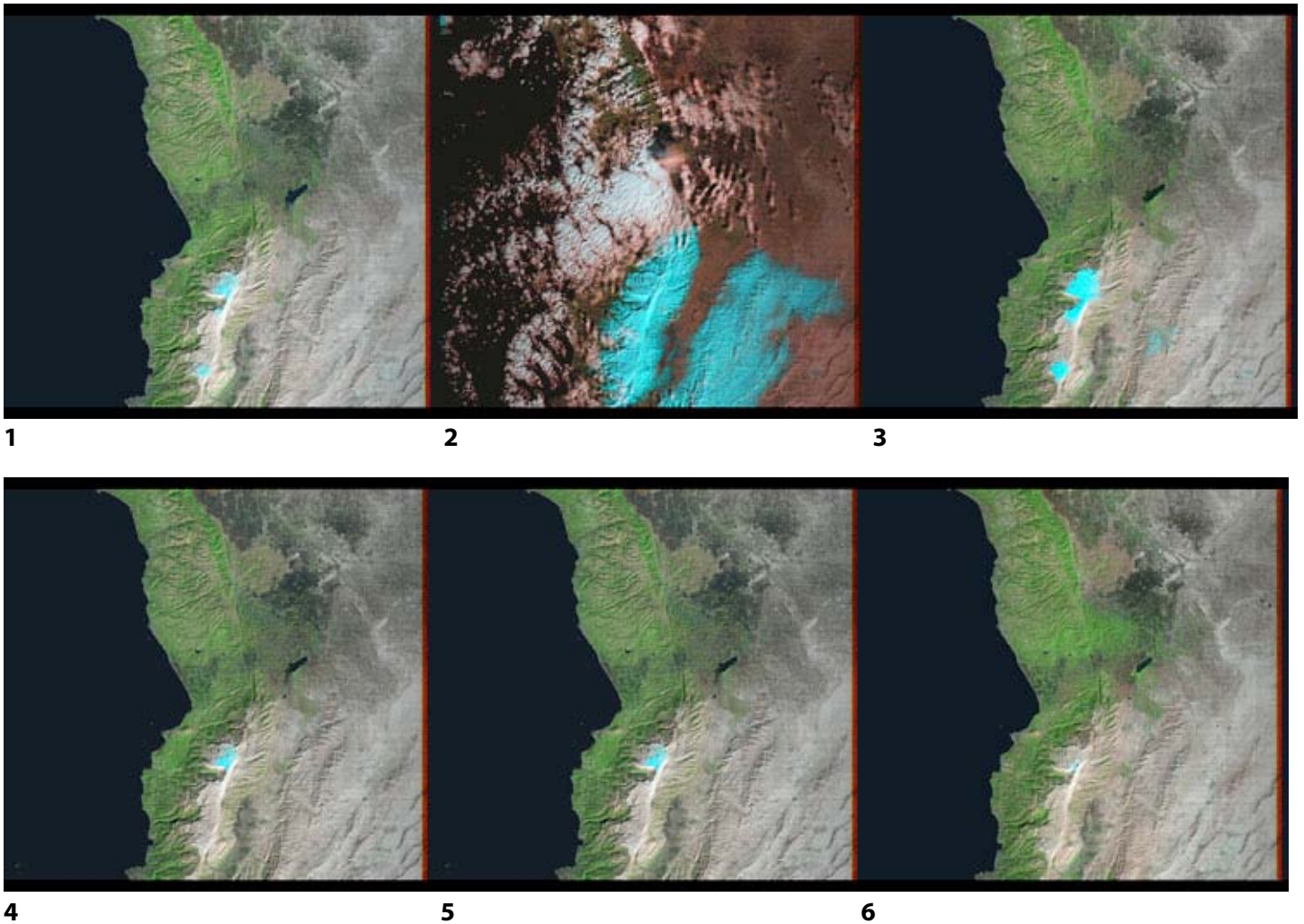
Many very important types of environmental change can not be seen in remote sensing images. Obvious examples would be invasive species or loss of species richness. Also, many very important changes take place in diffuse distributions making them difficult to see easily in remote sensing images; for example, selective logging. No matter how important the change is, if it can't be seen in the remote sensing image then there is no point to including those images.

It may have an effect opposite of that intended – convincing the reader that the change is not significant, even if it is.

The example of the Sunderbans shown above illustrates this problem. Among the important changes taking place in the Sundarbans mangrove forest is the loss of the species which the forest is named for, the Sundri Tree. Changes in the flow of fresh water from the Ganges have increased the salinity of the water reaching the tree, making it vulnerable to disease. The change is very subtle and cannot be seen in the two images from the 1970s and early 2000s.



Mangrove roots in the Sunderbans.



C. It is essential that changes be corroborated by solid published research, government studies, alternative data, and so on.

Finding apparent change in a pair of remote sensing images is not an adequate basis for producing a site study. Often what appears to be significant change can be seasonal change, cyclical change, differences in atmospheric conditions, differences between sensors, tidal inundation, the effect of a recent rain event, and so on.

All of the above images of northern Lebanon are from 2003 through 2008 in the month of November. If images 2 through 6 were presented without image 1 there would seem to be a trend of decreasing snow in the mountains from 2004 to 2008. Image 1 from 2003 is a reminder that seven or eight images from a few years are not enough to establish a trend. The trend may be real or it may not. It is essential to find valid scientific corroboration of what is apparent change before knowing if these images are appropriate to include in an environmental change atlas.

Generally, validating or “ground-truthing” the changes is beyond the time and financial resources of these site studies. Therefore, finding documentation of the changes that are observed in the images to avoid misinterpreting what appears to be environmental change is extremely important. A good knowledge of band combinations, sensor or data characteristics, phonological patterns, cycles of flood and drought and other variables can help minimise misinterpretation of images. It can also be very useful to use additional remote sensing images from other dates or from other sensors to support what is seen in the primary image pair or time series.

The three principles listed above should be kept in mind through out the entire process – from identifying possible sites, selecting sites, preparing images and writing the accompanying text.

BRINGING IT ALL TOGETHER

Standards and formats

At a more technical level it is essential to have a set of guidelines for formatting, file types, text editing standards, map and image proportions and so on. Some of these are standard and not dependant upon the design of a given book. These have been included in this document. Others will need to be determined as a part of the design process. If the previously published Atlases are to serve as a template for your publication then many of these guidelines can simply refer to examples from these Atlases.

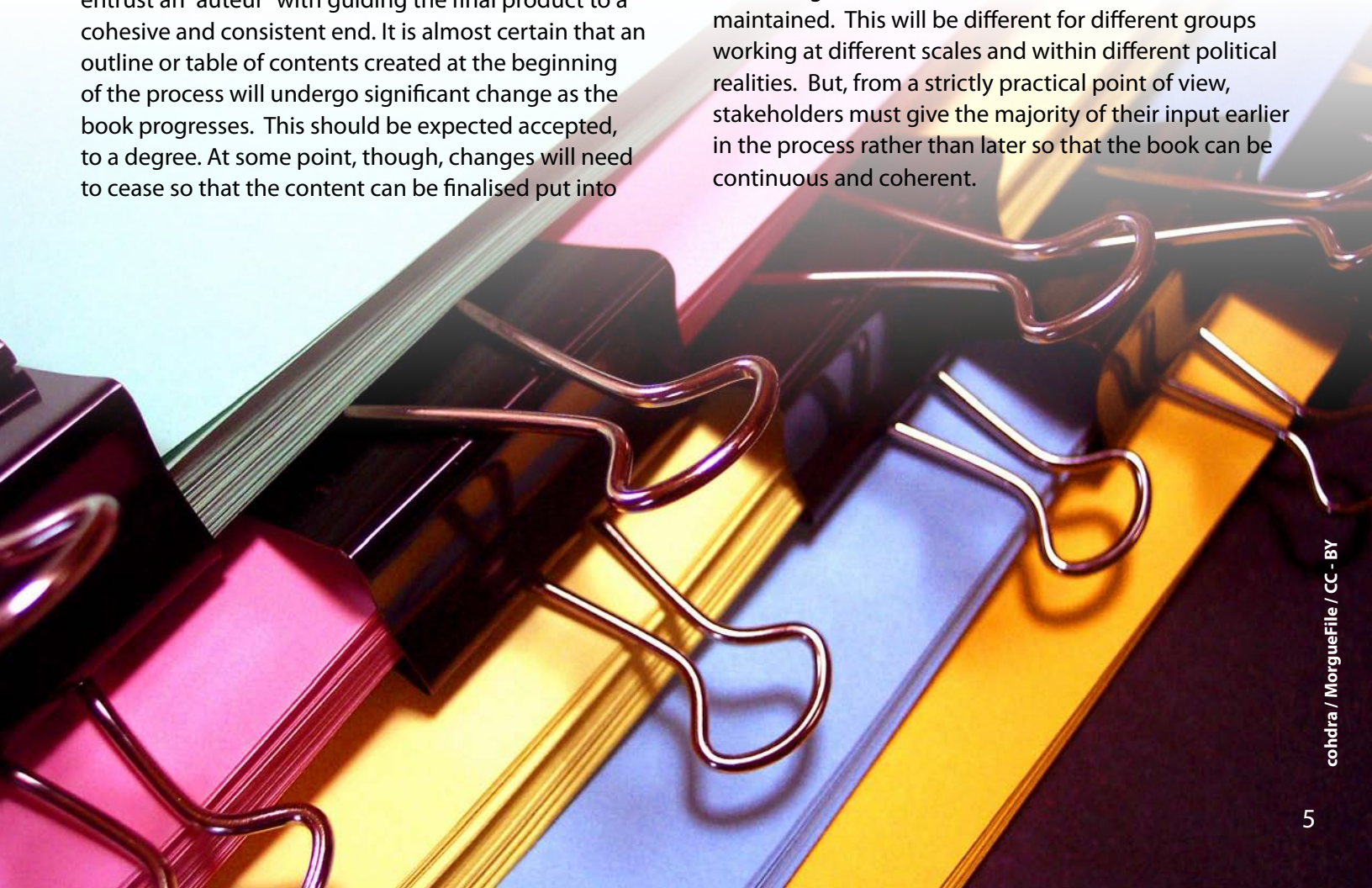
Continuity and coherence

Enforcing an overall vision of the final book being produced might come from a template created previously. This role can, to a degree, be filled by looking at the Atlases produced at GRID-Sioux Falls and using these as a model. However, as geography differs with location and scale, so have these Atlases. It is likely that variation of the model will be required. If this is so, then it becomes necessary to either 1) create a new and fairly comprehensive model to work from or 2) entrust an "auteur" with guiding the final product to a cohesive and consistent end. It is almost certain that an outline or table of contents created at the beginning of the process will undergo significant change as the book progresses. This should be expected accepted, to a degree. At some point, though, changes will need to cease so that the content can be finalised put into

a layout. Significant changes, additions or removal of content or order of content, can disrupt production of the entire book.

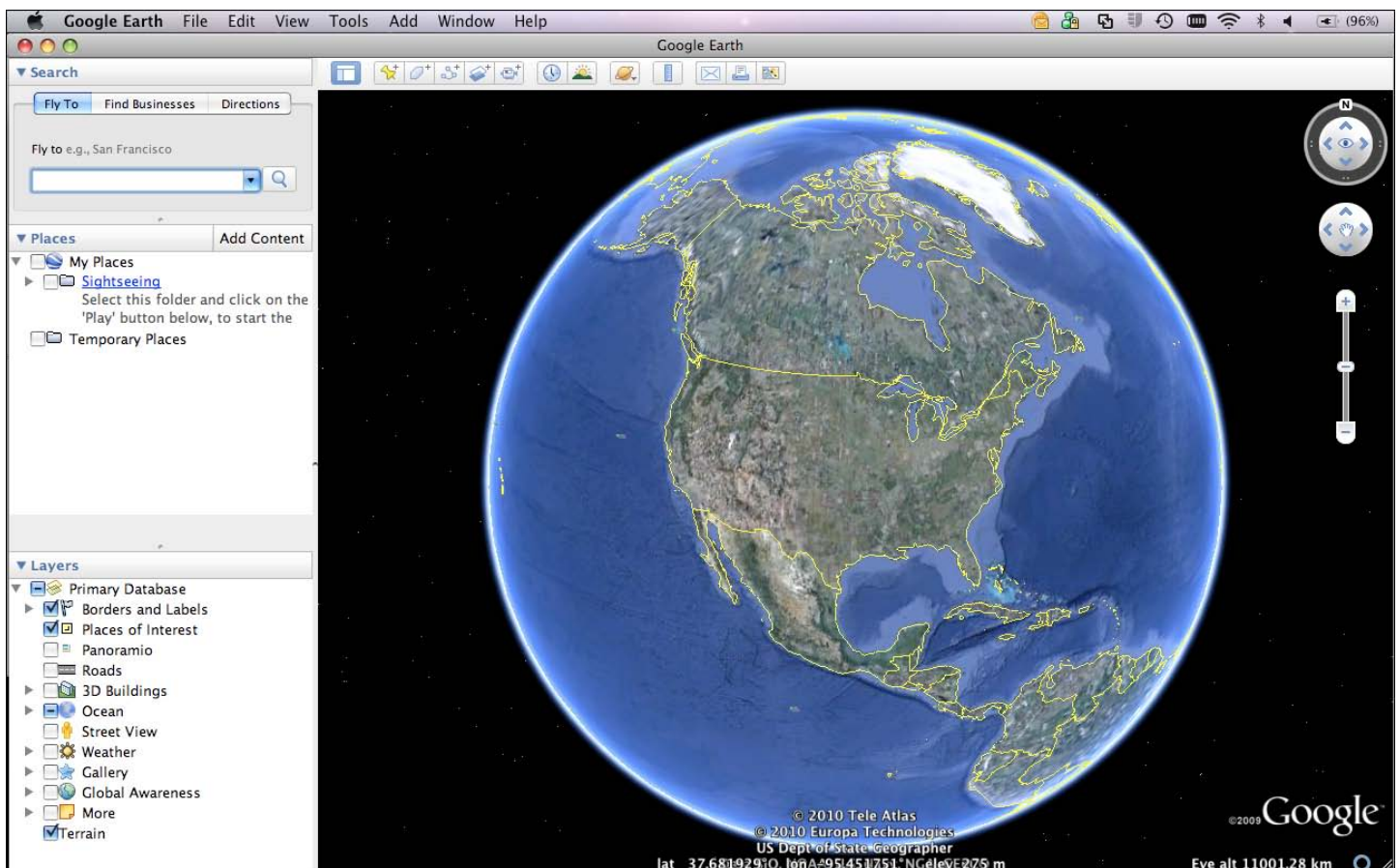
A book must have a reasonable degree of coherence and continuity. Agreement in the logic among all of the chapters can be disrupted when any one of the chapters is changed. For example; let's say that if the design of the book is organised by themes such as 1) grasslands 2) wetlands 3) forests, 4) urban areas 5) marine and coastal environment and 6) agriculture. Then, let's imagine that an important group of stakeholders with a background, and even perhaps a bias toward urban areas, feels that coverage of wetlands converted within urban areas should be in the urban chapter. Or, perhaps during the review process, a stakeholder such as a department of parks and wildlife feels that protected areas need to be covered as a separate chapter. In either of these cases the content from existing chapters will either be moved or become redundant. A chain of events begins that disrupts the entire order and content of the book and writing, editing, and layout throughout the entire book must be redone.

Therefore, it is important to put in place a process of creating an overall vision of the book that can be maintained. This will be different for different groups working at different scales and within different political realities. But, from a strictly practical point of view, stakeholders must give the majority of their input earlier in the process rather than later so that the book can be continuous and coherent.



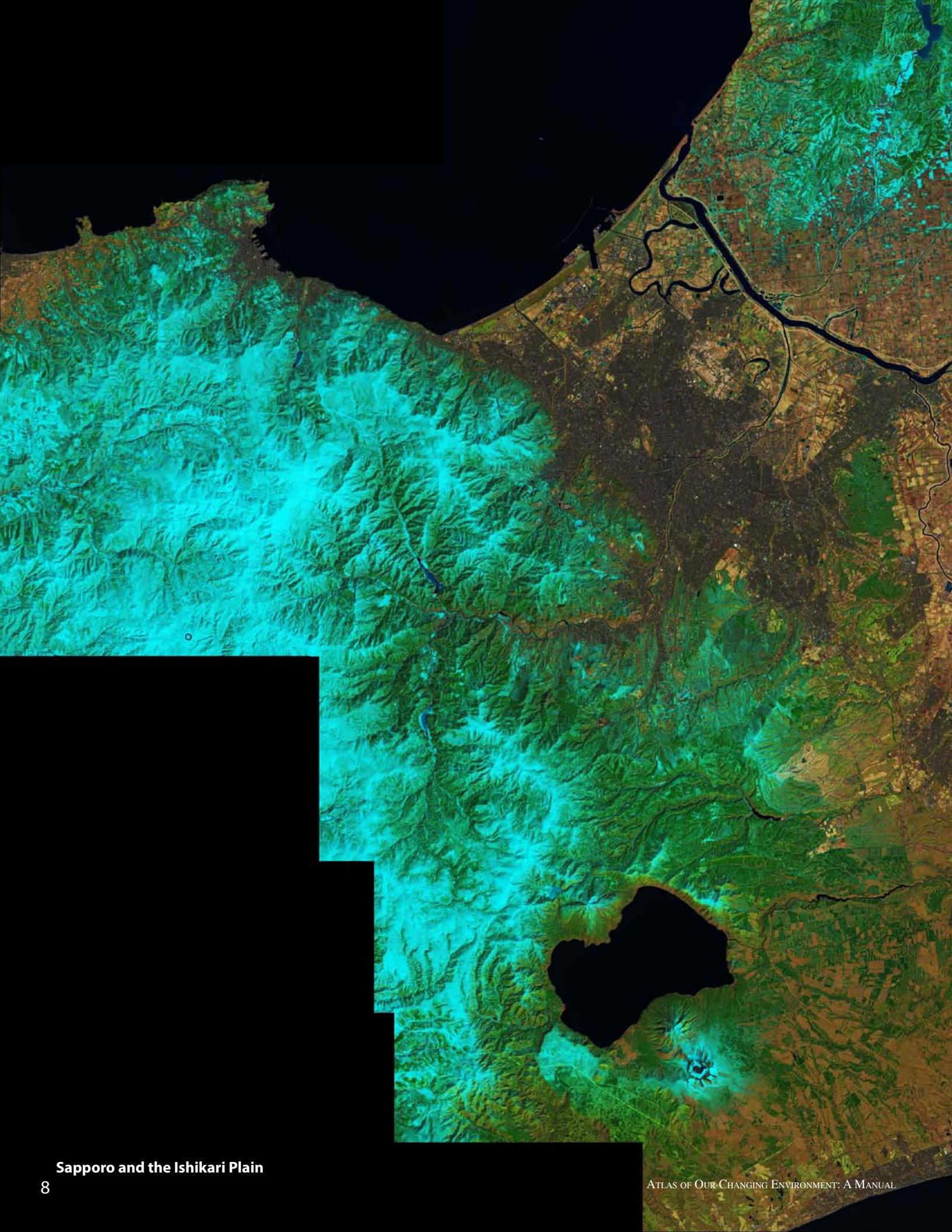
CHALLENGES

Technical challenges	Practical challenges
• Technical capacity exists in countries but enabling environment is lacking • Access and use of earth observations is still too complicated and expensive • Fusion of remote sensing and GIS is critical but simple user interfaces are needed (ERDAS, or ENVI + ArcGIS + Adobe Photoshop/Illustrator) • Access to Broadband Internet for data download is a major handicap ; better data compression techniques needed • Packaging and communication (Natural colour versus false colour) of policy relevant information is needed .i.e. linkages with MDGs, Poverty Reduction Goals, food security etc...	• How do we know what significant changes are taking place and where? • Wall to wall coverage and change analysis – not practical • Sampling strategy – Good for estimate • A combination of Literature search, informal networks, Google Earth • Collection and analysis of relevant data, story line and ground truth information is a time consuming task • How do we know that issues are policy relevant and actionable strategy could be developed • More information does not mean better decision making • How do we integrate physical sciences data to social sciences



CHECKLIST

Preparatory Phase		
What	When	
☐ Ensure Adequate Funds Availability and Resources	___/___/___	
☐ Define Start Date _____	___/___/___	
☐ Define End Date _____	___/___/___	
☐ Compile list of available data	___/___/___	
☐ Organise Stakeholder Consultation Meeting	___/___/___	
☐ Define Vision of the Atlas	___/___/___	
☐ Create an outline/table of contents	___/___/___	
☐ Assemble Technical Team under a Project Manager	___/___/___	
Production Phase		
☐ Identify Issues, Hotspots, Data, and Storyline	___/___/___	
☐ Start writing, research and data analysis	___/___/___	
☐ Start design and layout	___/___/___	
☐ Collect ground photos	___/___/___	
☐ Collect maps and satellite images	___/___/___	
☐ Create graphics, data visualisation	___/___/___	
☐ Verify copyrights and licenses	___/___/___	
☐ Finalise content and design	___/___/___	
☐ Obtain ISBN Number	___/___/___	
☐ Editing	___/___/___	
☐ Peer review process	___/___/___	
☐ Second Stakeholder consultation: review and final sign off	___/___/___	
☐ Finalise design and identify the printer	___/___/___	
Delivery Phase		
☐ Deliver content to printer	___/___/___	
☐ Onsite proof checking	___/___/___	
☐ Printing	___/___/___	
☐ Distribution	___/___/___	



An aerial photograph of a landscape. On the left, a river flows through a flat, agricultural area with a grid-like pattern of fields. To the right, the terrain rises into a mountain range with dense green forests. The sky is not visible. The text 'PART 1' is centered over the mountain range.

PART 1

General Guidelines

“What is needed”

Preparatory Phase

Creating a book from an assortment of information and imagery requires both an adequate grasp of the details of each step of production and a clearly enforced vision of the overall finished product.

The following tables will give some idea on the content of the UNEP Atlases. It is essential to have a clear vision of the product and this role can, to a degree, be filled by looking at the atlases produced at GRID-Sioux Falls and using these as a model. However, the book is ultimately built from the available data. A thorough survey of available data will give you a good idea of the raw materials you have (or don't have) to build with. It is very important to use this knowledge when you are developing your vision and creating a table of contents.

Production Phase

While the production phase activities, as previously introduced, are the most critical ones, attention must also be paid to the following elements as well.

The International Standard Book Number (ISBN) must be obtained in the initial stage of the book production.

Copyright Clearance is must wherever relevant (Photos, articles). It is very important to obtain this clearance from the concerned organisation or person in written and archive their responses.

Facts and Figures used in the text must be supported by **references** in parenthesis. Special attention is required

Atlas Production Phases

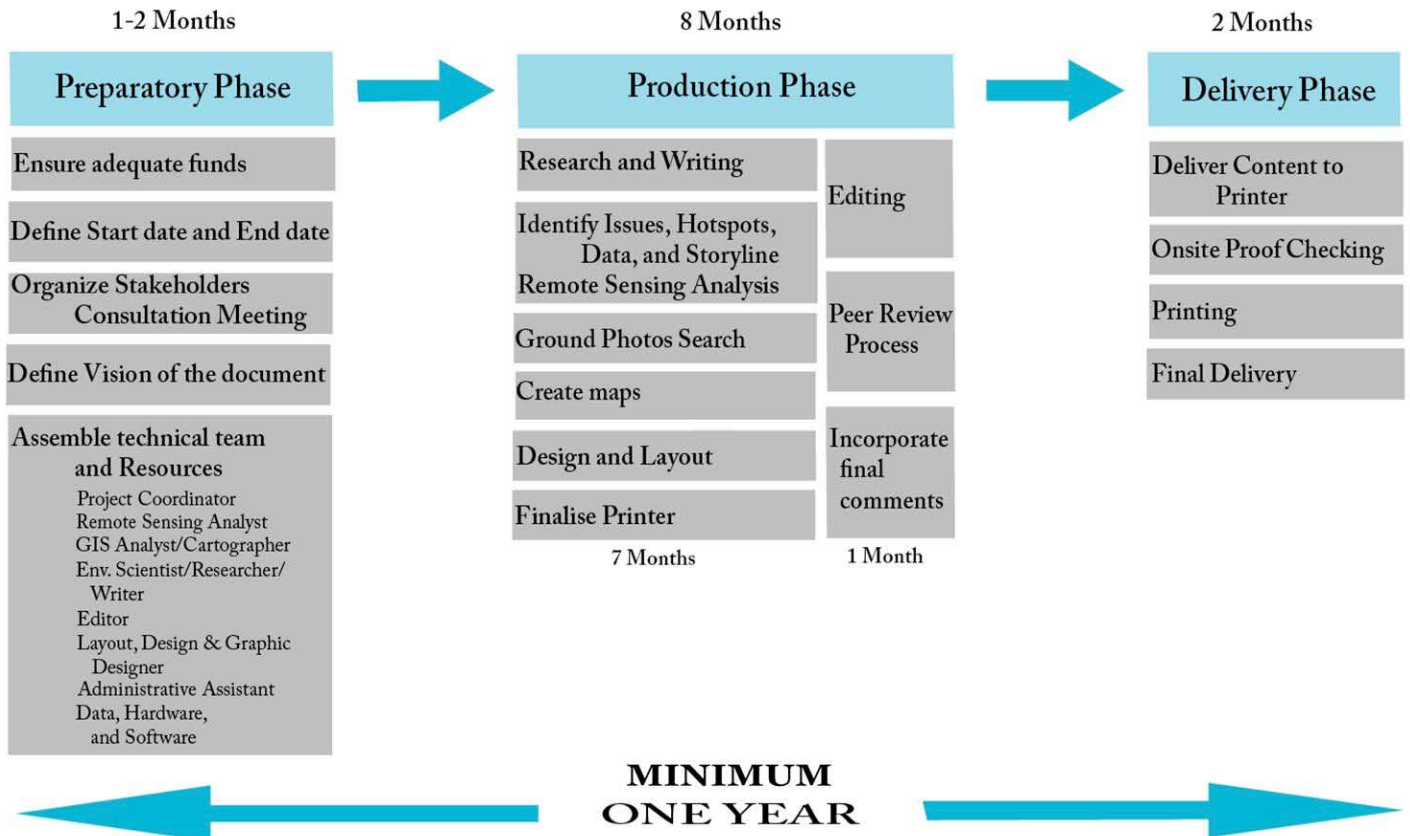


Table of Contents

Chapter	ONE PLANET MANY PEOPLE	AFRICA (English and French)	KENYA
1	Introducing the Planet	Africa – The Continent	Environment and Vision 2030
2	People and Planet - Human Influences on the Planet	Transboundary Environmental Issues	Progress towards Millennium Development Goals
3	Human Impacts on the Planet – Visualizing Change over Time	Tracking Progress Towards Environment Sustainability (includes 53 countries and 1 self governing territory)	Transboundary Issues
4	Natural and Human-induced Extreme Events	(Country profiles and two examples of local changes in each country)	Environmental Hotspots
5			Nairobi and its Environment

Statistics

Content Description	ONE PLANET MANY PEOPLE	AFRICA	KENYA
PAGES	332	390	168
WORDS	93,000	123,000	47,153
SATELLITE IMAGES	271	316	70
ENVIRONMENTAL HOT SPOTS	80	104	30
GROUND PHOTOS	215	319	229
MAPS	66	151	65

to quote the references. It is important that the writers ensure that they add references right when they are writing the text.

UNEP has followed Global Environment Outlook (GEO) style for quoting references.

An acknowledgement list that includes all the people and organisations who will be contributing to the Atlas in any way must be maintained from the beginning of the project through its end. Regular reminders to writers and researchers will always help.

Acronyms, abbreviations and Index bring completeness to the book.

An outline or table of contents created at the beginning of the process will undergo significant changes as the book progresses. This should be expected and to a degree accepted. However, at some point the content will need to gel into a finished draft so that content can be put into a layout. Significant changes in the content or order of the content, addition of new content, or removal of content can all disrupt the entire book – taking the layout process back to near the beginning of that process as well as requiring significant re-editing and rewriting.

Printer must be finalised during the late production phase.

Delivery Phase

The most important activity in the final phase is onsite proof checking. Although high resolution proof will be a bit expensive than the draft proofs at press, it is highly advisable that if funds available, one must request high resolution proofs. Several issues like fonts. Shades of colour go un-noticed in low resolution proofs. This activity ensures that the content is being printed as intended.

REQUIRED RESOURCES

The Organisation must have sufficient funds available to support the cost on the following resources;

- Project Coordinator for the entire production period

- Manage streams of input coming from various sources i.e. text, storyline, photos, images, maps
- Request to agencies/individual for permission to use their work as and when required
- Manage time and resources, schedule meetings, facilitate communication between the production team
- Contribute to the final compilation of the atlas
- Possibly help with searching for ground photos

- Environmental Scientist/Researchers/Writers – Full time for 6 months

- Identify potential sources of materials to be used in the Atlas
- Write site stories and other text for the Atlas
- Research scientific papers for relevant information, facts and figures



- Remote Sensing Analyst – Full time for 10 months

- Identify and verify environmental change sites for needed locations
- Prepare remote sensing image change pairs using Illustrator

- GIS Analyst/ Cartographer – Full time for 3 to 10 months (depending on atlas design)

- Overlay remote sensing images with map layers for publications
- Create maps and map locators

- Editor – Full time for 1 month

- Develop an annotated outline of the Table of Contents and write the epilogue for the Atlas, and a prospectus to promote the Atlas
- Proof-read and revise text at all phases of production, including promotional material to help ensure the messages are clear

- Layout, Design & Graphics Designer- Full time for 3 months for 150 page book

- Design and layout the Atlas, outreach material and posters. Based on experience, scheduled time for layout and design should be approximately one month for every 50 pages of the book

- Administrative Assistant – Part time

- Handle required administrative tasks like travel arrangements for meetings, set up meetings, support staff in assigned project based work, etc

- Data, Imagery, Hardware, and Software

- A **good Internet service** is a must and most critical for the project.

Data

- Some GIS data (administrative boundaries) is free for download from internet websites or can be obtained from supporting agencies

Imagery

- Landsat data is imagery, however, you may require images for which you will have to pay e.g. SPOT Image high resolution imagery

Hardware

- Robust computers that can hold large file sizes, software programs, and support external hard drives
- Printers- Colour and Black & White

Software

- GIS Software (ESRI-ArcGIS) and ERDAS Imagine are absolutely essential. It may be possible for experienced GIS technicians to adapt these tasks to other software packages; however it will present a significant challenge and would likely require considerably more time.
- Adobe InDesign or Quark Express, Adobe Photoshop, Adobe Illustrator, and Adobe Acrobat Professional
- Microsoft Office Suite

- Printing cost

- Printing cost to include printing of the book, shipping the consignment to the required location, onsite proof checking (travel+ proofs), possible correction charges, outreach material.

EXAMPLE FOR COST ESTIMATING

1000 copies of Kenya Atlas of our Changing Environment were printed for approximately **US\$20,000** (excluding onsite proof checks and related travel). This included the shipping cost of all books from Malta to SMI, London

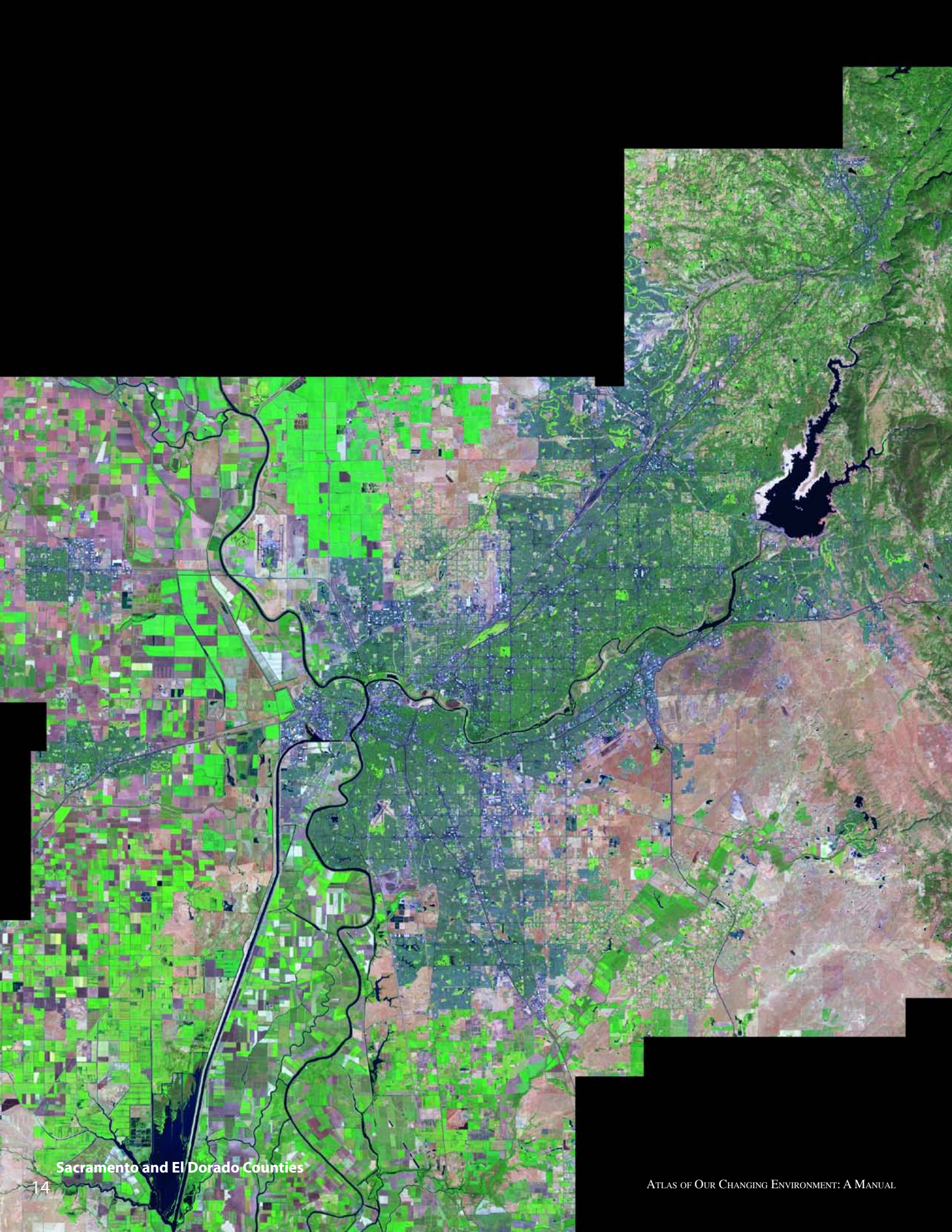
3000 copies of Africa Atlas of our Changing Environment were printed for approximately **US\$71,000** which also included the shipping charges from Malta to SMI, London.

- Outreach cost

- To promote Atlas, you may decide to procure some outreach material, exhibit at conferences which will involve some travel cost

- Other Miscellaneous cost

- Meetings with the stakeholders and related travel and coordination expenses



Sacramento and El Dorado Counties

An aerial photograph of a mountainous landscape. The terrain is covered in dense green vegetation, with numerous ridges and valleys. Several dark, irregularly shaped water bodies, likely lakes or reservoirs, are scattered across the landscape. The overall scene is a high-resolution aerial view of a natural environment.

PART 2

Technical Specifications

“How to do it”

TECHNICAL DETAILS

1. PLANNING

Define the end product or products.

The first step in creating an atlas or other collection of this type of change pair studies is to define the end product. Will there be multiple formats (print, web, powerpoint, Google Earth) or just a book or website? Failing to define this upfront will almost always lead to redoing work to fit the requirements of the additional formats.

Once the various outputs are determined it will be necessary to know what each of these final products will require. Each format will have some unique requirements. For example if a website is based on a php template which assembles each individual site on the fly, you will need to create a set of standard sized images with uniform naming conventions in pre-determined file formats. If you are putting the images in a large format book you will need to meet the image resolution requirements for printing a high quality book – 300 dpi resolution, CMYK colourspace, and some standard of quality for the photography.

What will the final products be?



Print?



Website?

Google Earth?



Knowing the final product is essential for deciding:



Print?

Minimum image resolution

Dimensions of images & maps

Time needed for editing & printing

Amount of content needed



Google Earth?

Staff/Skill sets needed for production

Georeferenced final product?



Website?

Planning time line

Creation of tracking documents/systems

Knowing the final products will allow you to design a process that minimises duplication of effort and in possibly save you from starting much of the production process over from the beginning. By knowing the final products you want to end up with, you will be able to design an efficient production process that will give you multiple outlets for the content that you are presenting.

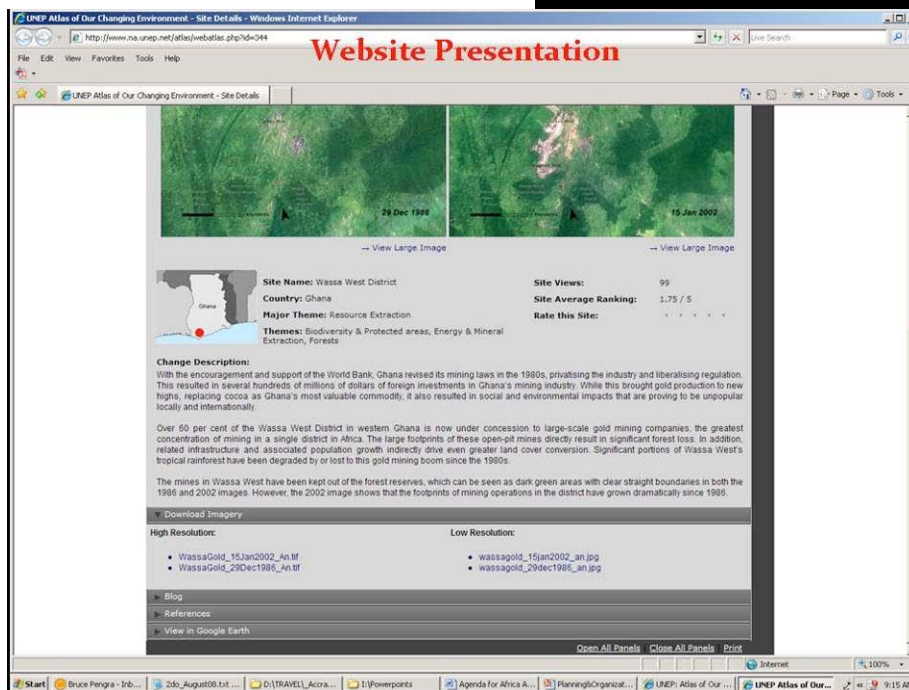
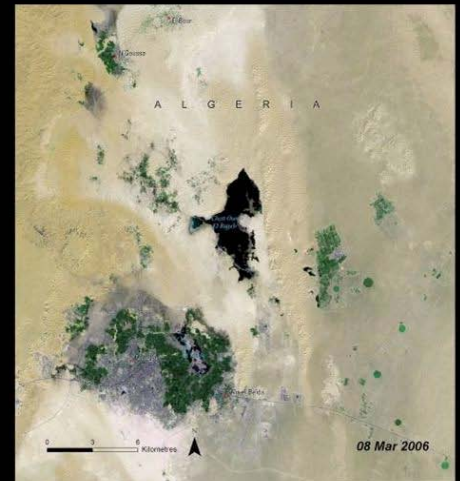
Powerpoints are fairly universal and easy to produce.

Powerpoint Presentation

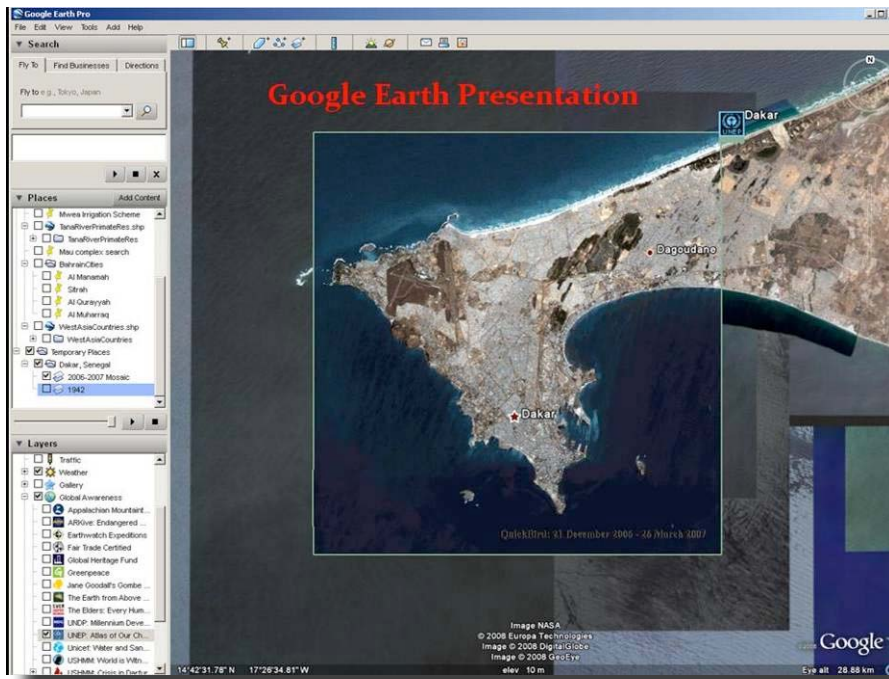
Modern Irrigation: Ouargla Oasis

The 1976 image shows date palms surrounding Ouargla and Chott Ain El Beida, a saline depression that has collected irrigation runoff for generations

The 2006 image shows a proliferation of irrigated land, which, without proper management, will not be sustainable



Websites require considerable planning and design upfront, but allow new content to be added as it becomes available. They are also flexible allowing for the distribution of additional products such as related maps, videos, links to other sites, high resolution images and so on.



Google Earth provides access to a very large audience. It is reasonably straight forward to create the content for Google Earth, however, without an arrangement with Google Earth to host your content on their servers you will need to create a system of serving this data through the internet.

A print atlas requires more planning and requires higher standards than of the other possible formats. Planning is essential for achieving high production values, continuity of content, thorough editing of text and maps, formal style requirements, copyright considerations, quality of photographs and attractive design to name a few. It would be wise to include someone with experience in producing a book for print in the planning process to avoid setbacks later in the process – even if the layout and design is ultimately contracted out.

In addition, at some point the production of a book will require delivery to a printer. This will set a firm cutoff for any changes and fixes to the content. This can be both an advantage for enforcing a timeline and a disadvantage in that it will require an endpoint to improvements and corrections.

A print atlas requires the most complete plan:

Including but not limited to:

Table of contents

- How many pages?
- How many chapters?
- How many subjects?
- How are subjects treated?
- What images are needed?
- What maps are needed?

Continuity of design

- Standardize map symbology
- Standardize writing style
- Standard elements (locators, etc.)
- Standardize headings / hierarchy

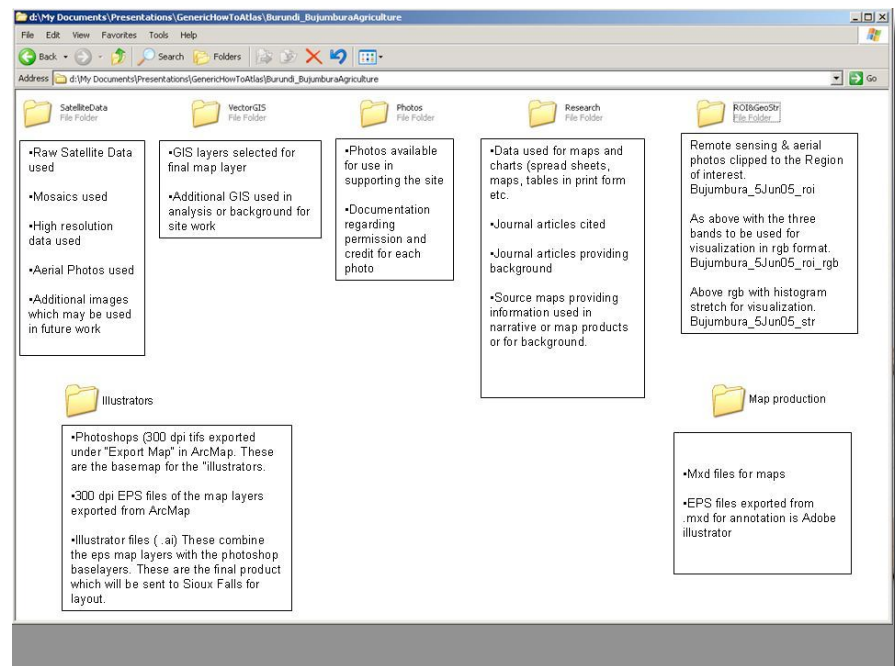
Production details

- What format for maps?
- What format for images?
- Who does copy editing & when?
- Coordination of text with images
- How many languages for Maps, image annotation, text, references?



Create a Data Directory:

Once production of change-site content begins it will be important to organise the output in a way that facilitates tracking of progress, back up of completed work, standardisation of output and accessing this work in the future. The directory structure given below has developed from the work on atlases at GRID-Sioux Falls over the past 10 years and serves these purposes well. Population of the directory is in itself a good organising tool in that it supports the use of naming standards, production of common elements for every site, saving of relevant work files and research and so on. This standardisation also allows multiple people to work on the same site over time, if necessary.

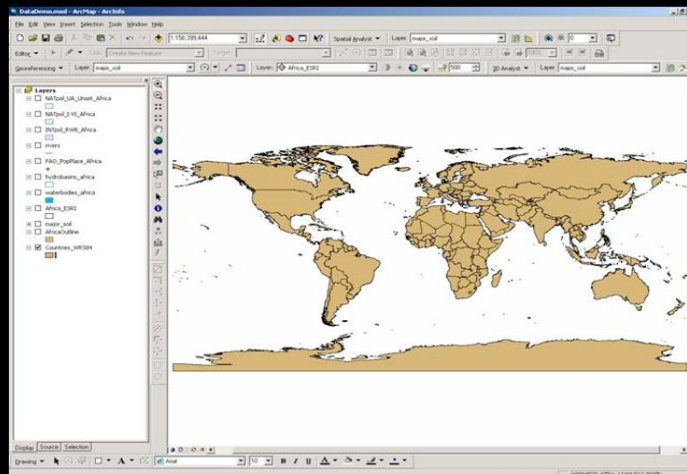


Collection of GIS data

- Identified the best data sources
- Collected the datasets
- Sort out and preprocess data

Key considerations:

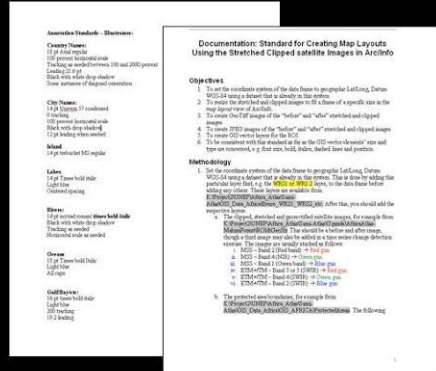
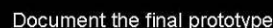
- Compatible with other datasets
- Up to date
- Adequate metadata
- Use not restricted



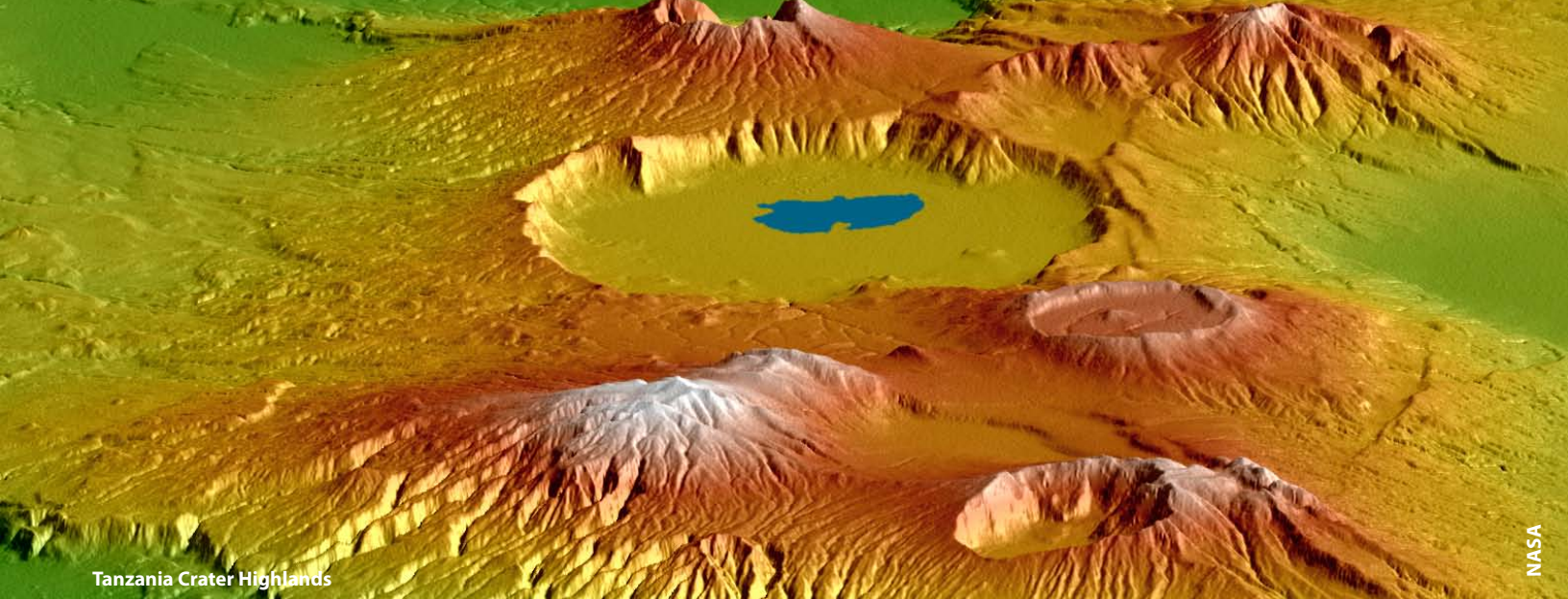
A GIS collection, or at a minimum a defined set of data sources, is useful for standardising maps and saving time by avoiding data searches for each site's production.

One simple but useful approach for setting standards for design, organisation, writing style, content limits and other print considerations is to create a prototype or mock up of representative content for the book. Once this is done standards can be recorded in a style guide. For example, colours, fonts, north arrow style and border style to use in all maps. To ensure consistency, it is important to convey this standard to all who are involved in producing similar content. If this standard guidelines are not followed, it creates many problems at later stages. **The annotation standards guide used in atlas production is included in the annex of this document.**

produce prototypes of several representative pages.

[illegible]

A spreadsheet with the status of each of the prospective sites helps planning in many ways. It allows easy determination of site status by theme, location, contributor and so on. It is quite valuable for tracking production of various elements when sites are being produced in multiple formats. It allows multiple parties to work on sites in a coordinated fashion. For example, if a viable site is being worked on by one person, a second person can begin searching for supporting ground photos. Or, if a site has been completed for print presentation, it can be processed for web presentation by a second person.



Tanzania Crater Highlands

2. SITE SELECTION

Ideas for change sites for the change atlases published through GRID-Sioux Falls have come from a variety of sources. Confirmation of these ideas as viable sites was accomplished by one of three paths. In some cases we **started with an issue** and then went in search of an

example of that issue which was suitable for showing with a remote sensing change pair. In other cases **we started with an important instance of environmental change** in the literature and went in search of imagery suitable for showing that change. Often **we started with multiple dates of imagery from a given location** and went in search of documents that could explain the areas of change we saw.

In the end each viable site required three things:

1. Images

2. Issue

1. Deforestation
2. Coastal erosion
3. Biodiversity loss
4. Unsustainable agriculture

3. Documentation

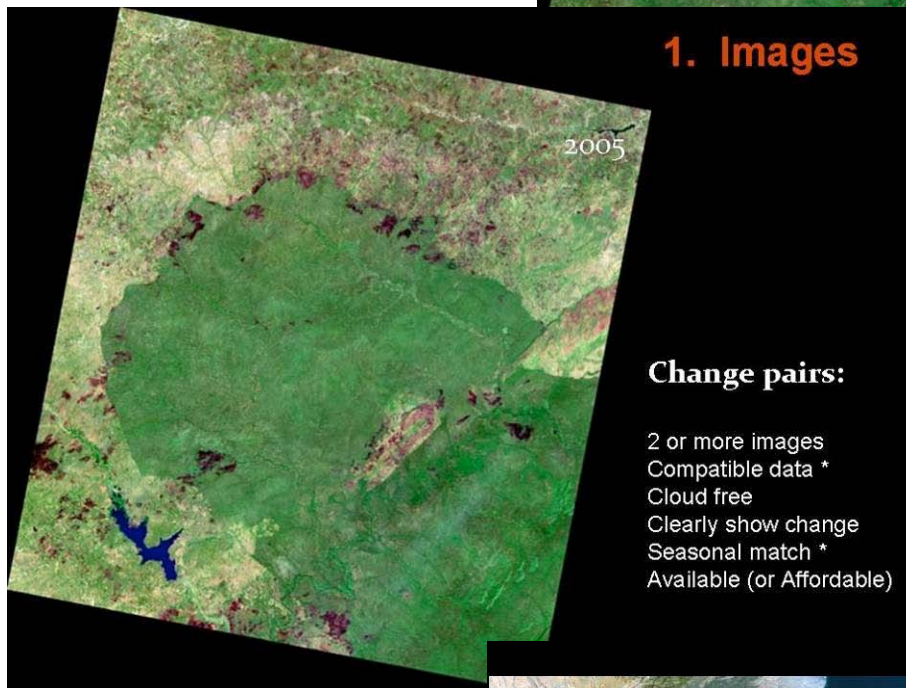
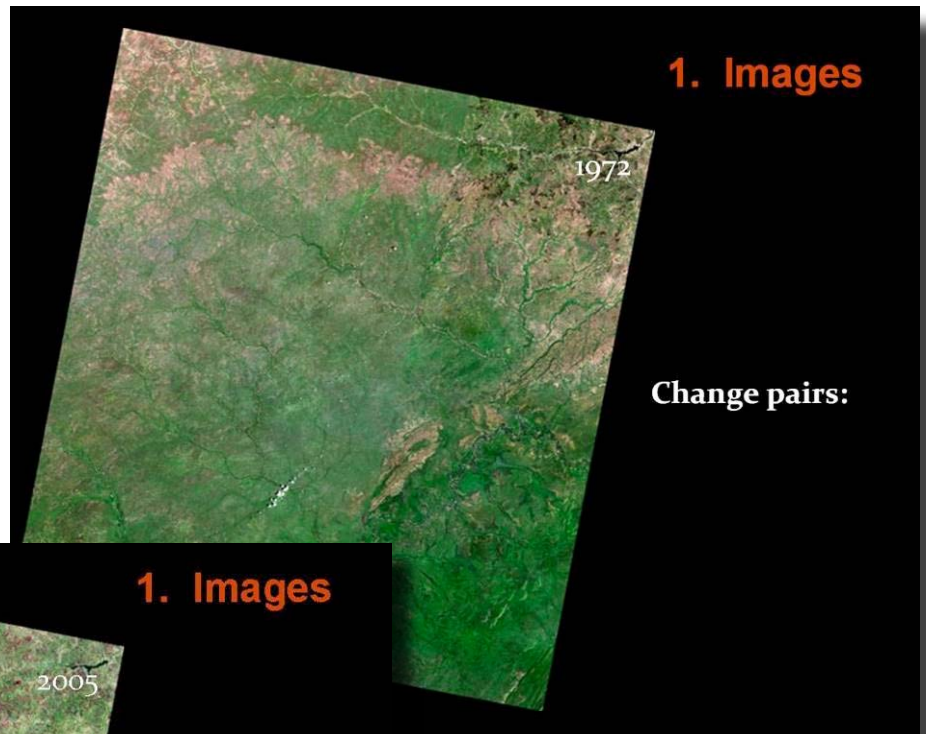
ATLAS OF OUR CHANGING ENVIRONMENT: A MANUAL

21

#1) Images

Images need to be available which show an instance of change relating to this issue.

For this type of presentation it is generally not enough that change can be detected in an image by an experienced analyst – it must be readily visible to a layperson. This generally requires finding two or more images of compatible data which



are cloud free, seasonally matched, available and clearly show change.

In some cases alternative use of remote sensing images can convey the environmental change effectively. Some possible strategies are using high resolution imagery, additional map layers delineating the change, 3D visualisation and/or additional annotation. However, it has proven to be much more effective to add the element of time to the presentation by having multiple dates of imagery.



1. Images

Using other than change pairs:

High resolution
Map layers
3D visualization
Annotation

The bottom line – the pictures alone should be able to communicate much of the information.

A warning/reminder about data availability:

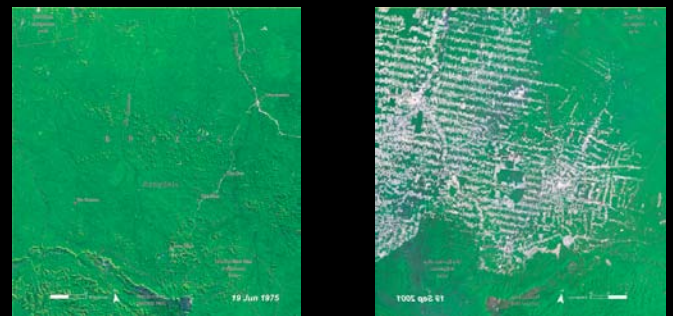
Satellite images are not available for all places for all periods of time. The Landsat program has substantial continuous global coverage, but is rather fragmented when considering spatial and temporal coverage of the globe. The Landsat program began collecting data in the form of remotely sensed images on July 23, 1972. Its

orbits allowed complete global coverage every 18 days, but the images were downloaded to many receiving stations around the globe where they were kept on analog tape. As a result, data was not transferred and archived at one central collection point. The fundamental challenge of preparing change pairs is finding two or more cloud free images of the area of change that are from differing dates.

#2) An environmental issue

Change pairs are an excellent means of demonstrating important environmental changes to a variety of audiences. The chosen sites should relate to an important environmental issue such as climate change, deforestation, water quality and so on. It may be possible in some cases to show a related change in imagery for the purpose of presenting a more central issue. For example, the loss of key habitat could be shown with remote sensing for the purpose of discussing an endangered species.

2. Issue



Baby gorilla in Bwindi

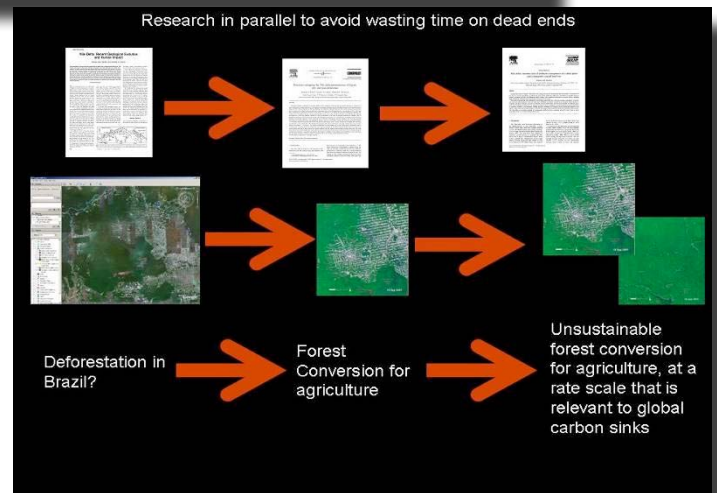
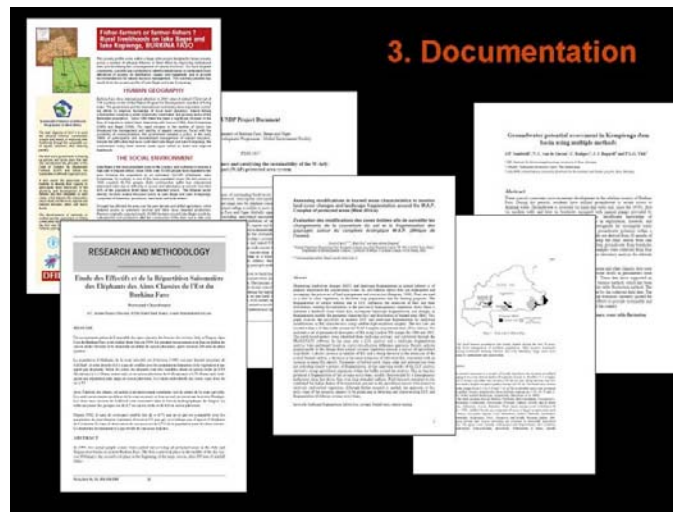
#3) Documentation

Adequate documents and/or supporting data are needed to verify and or validate our image interpretation.

Many types of publication can be useful for providing background and context to the change-site study, but there must be adequate documentation in valid journal articles, government documents, UN documents, etc. to provide confirmation of the changes being observed in the images.

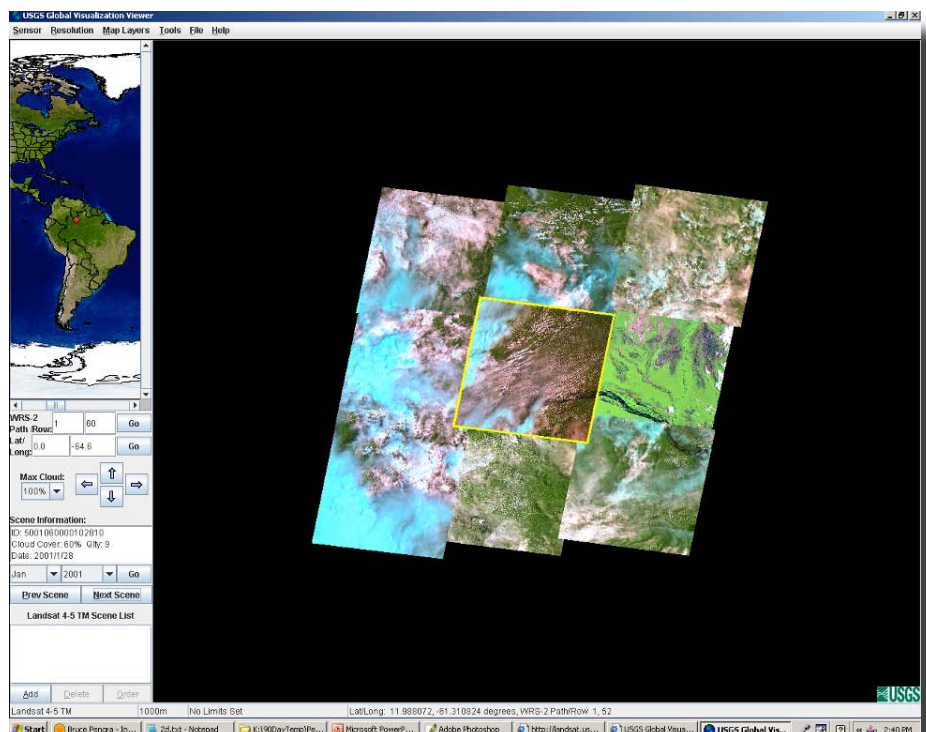
It is highly recommended that all three threads of investigation are followed in parallel to avoid wasting time on an issue that has no images to support it or images that have no documentation to support them and so on.

For example, if raw images are available, search for available documentation before going through the process of preparing the images and map layers for presentation and vice versa.

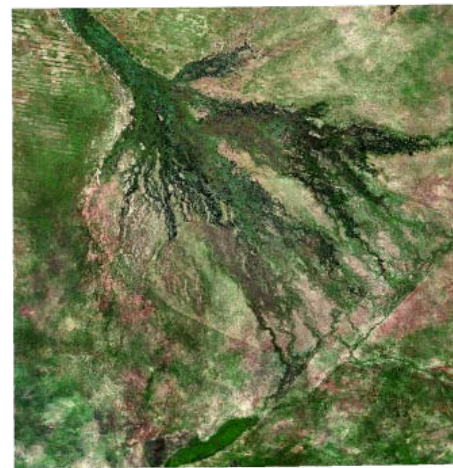


3. PREPARATION OF THE IMAGES

Select the best data available
At this point, only sites with adequate data should be under consideration for more exhaustive data searches for even better imagery. Better imagery will not only make the final product better, but will also make production of change pair easier. The better the quality, resolution, seasonal match, absence of clouds, similarity of sensor and time span, the easier it will be to show the change in a way that the layperson can see.



Once the data has been collected, ensure that the satellite images and all supporting GIS data have a common projection. Then, make sure they are appropriately registered to each other.



Select the appropriate bands for presenting the change pairs.

This is an important step and requires some knowledge of the sensor characteristics of the available images. Comparison of images which are from the same sensor should always use the same bands. For example comparing a TM image to a TM or ETM image you could use the 7 band displayed as red, the 4 band displayed as green and the 2 band displayed as blue. When making comparisons between different sensors this becomes

more complicated; for example comparison of an MSS image with an ETM image.

Below is an example of matching bands between MSS, TM and ETM images. The MSS image has no blue band, no mid-infrared band, no panchromatic band and no thermal band. The best set of bands that are roughly the same between these two sensors are the green band, the red band and the near-infrared band (as shown in the second image).



Available bands for MSS, TM and ETM images:

MSS Bands - Landsat 1-5

Band Number	μm	Color of light	Resolution
1	0.5-0.6	Green	80 m
2	0.6-0.7	Red	80 m
3	0.7-0.8	Near IR	80 m
4	0.8-1.1	Near IR	80 m
n/a	10.41-12.6		237 m

ETM+ Bands - Landsat 7

Band Number	μm	Color of light	Resolution
1	0.45-0.515	Blue	30 m
2	0.525-0.605	Green	30 m
3	0.63-0.69	Red	30 m
4	0.75-0.90	Near IR	30 m
5	1.55-1.75	Mid IR	30 m
6	10.4-12.5	Thermal IR	60 m
7	2.09-2.35	Mid IR	30 m
8	0.52-0.9	Panchromatic	15 m



Select band combinations to use

TM Bands - Landsat 4-5

Band Number	μm	Color of light	Resolution
1	0.45-0.52	Blue	30 m
2	0.52-0.60	Green	30 m
3	0.63-0.69	Red	30 m
4	0.76-0.90	Near IR	30 m
5	1.55-1.75	Mid IR	30 m
6	10.4-12.5	Thermal IR	120 m
7	2.08-2.35	Mid IR	30 m

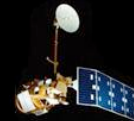


MSS Bands - Landsat 1-5

Band Number	μm	Color of light	Resolution
1	0.5-0.6	Green	80 m
2	0.6-0.7	Red	80 m
3	0.7-0.8	Near IR	80 m
4	0.8-1.1	Near IR	80 m

ETM+ Bands - Landsat 7

Band Number	μm	Color of light	Resolution
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4	0.75-0.90	Near IR	30 m
5	1.55-1.75	Mid IR	30 m
6	10.4-12.5	Thermal IR	60 m
7	2.09-2.35	Mid IR	30 m
8	0.52-0.9	Panchromatic	15 m



Select band combinations to use

TM Bands - Landsat 4-5

Band Number	μm	Color of light	Resolution
1	0.45-0.52	Blue	30 m
2	0.52-0.60	Green	30 m
3	0.63-0.69	Red	30 m
4	0.76-0.90	Near IR	30 m
5	1.55-1.75	Mid IR	30 m
6	10.4-12.5	Thermal IR	120 m
7	2.08-2.35	Mid IR	30 m



These bands are not from exactly the same segment of the light spectrum and the characteristics of MSS, TM and ETM have other important differences as well, however they are generally similar and are generally the best choice for comparing between MSS and either TM or ETM.

Clearly, it is not possible to display these bands as the same part of the light spectrum which they are collected from. The near-infrared band is not within the visible range of human sight and must be shown as a different

colour in any image. Also, MSS images do not have a blue band, therefore blue light in the display or image to be produced will not be representing light collected from the blue part of the spectrum.

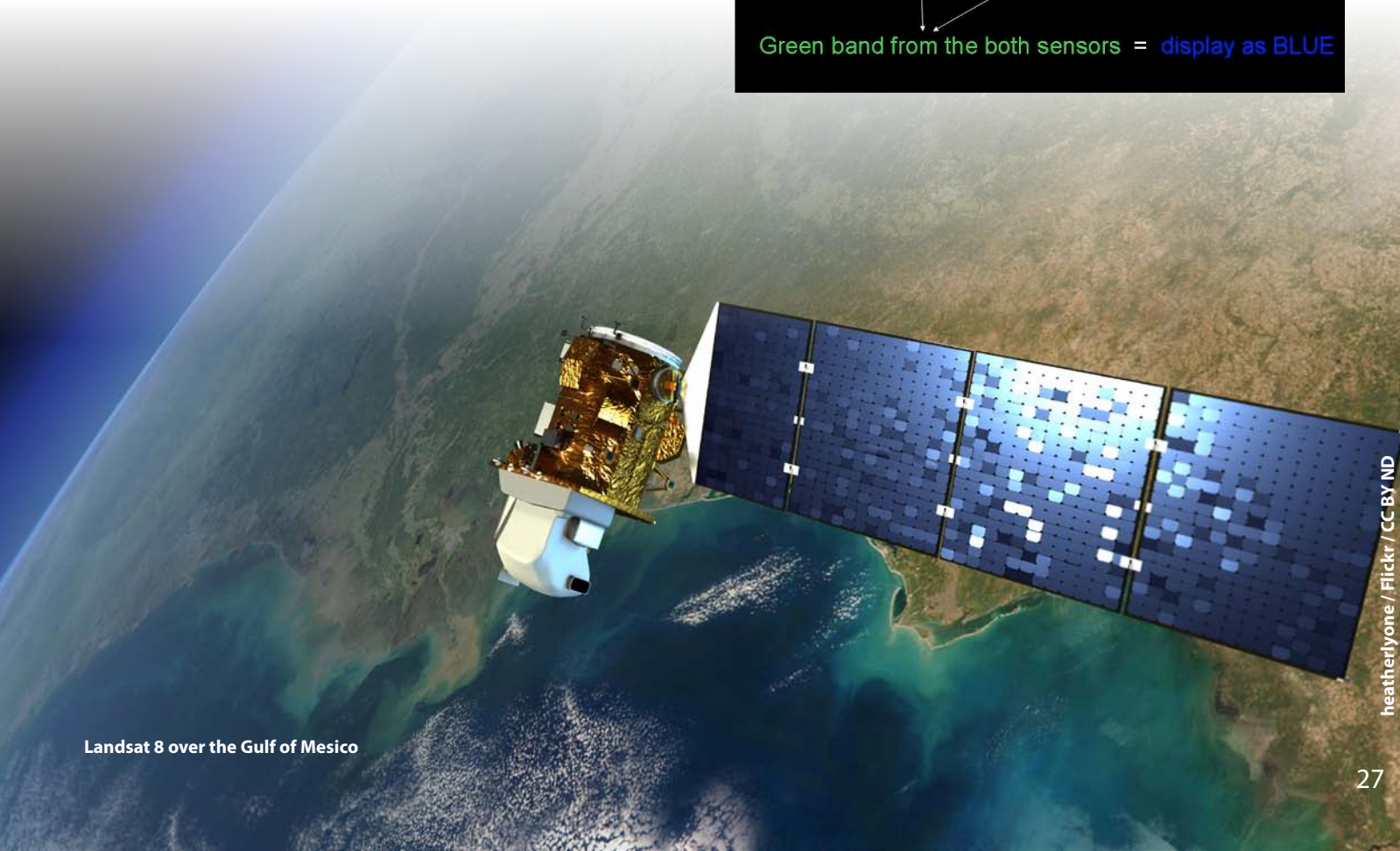
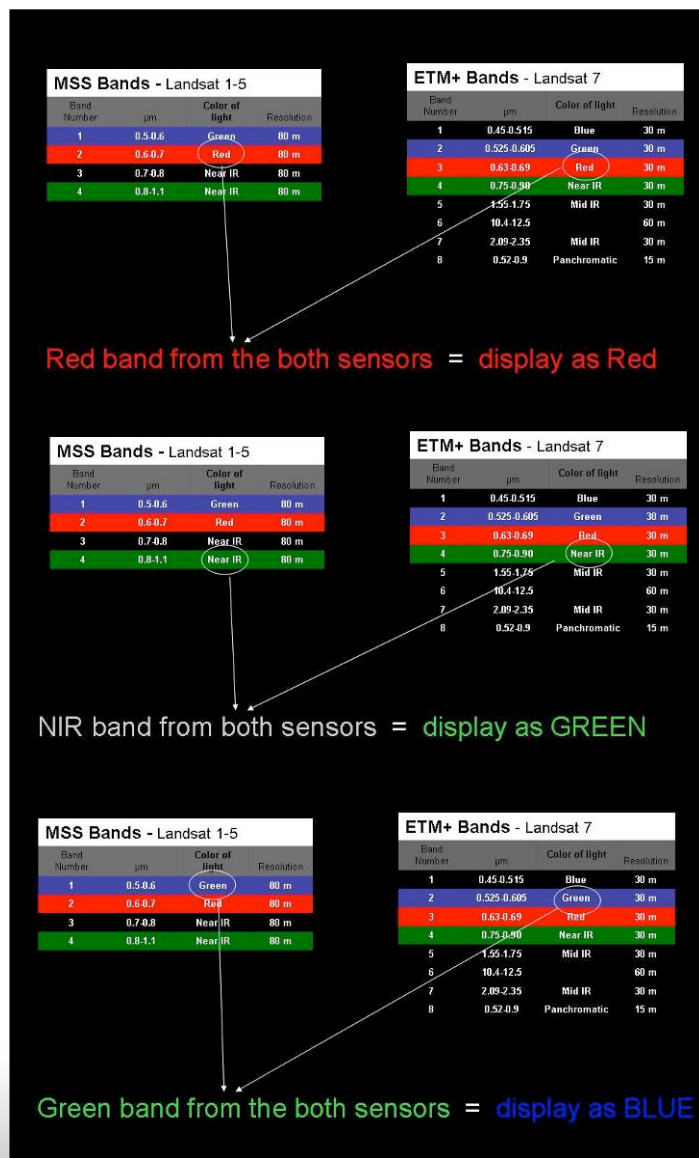
Since these publications are for a general audience, , it is best to try to make the colouration of the image fairly intuitive. Maps generally use the colour green to represent a forest rather than red because it is more easily understood. In the same sense, displaying vegetation with green light, water as blue and bare ground as red to neutral colours makes it easier for the layperson to interpret remote sensing images.

The band combination that does this best in a comparison between MSS data and TM or ETM data is:

MSS band 2 displayed as red
 band 4 displayed as green
 band 1 displayed as blue

TM/ETM band 3 displayed as red
 band 4 displayed as green
 band 2 displayed as blue

(This same combination works with an ASTER image which have the same bands as MSS data at 15 m resolution) or, in graphic form.



Landsat 8 over the Gulf of Mexico

For comparing Landsat TM or ETM data to other Landsat TM or ETM images always use the same band combinations in each image of the change pair or time series.

There are several ways to accomplish many of the processes that are steps in producing the final annotated image change pairs. In some cases, a particular software application may provide some advantage for one type of site or data and another application might be better suited in the next case. We use

Our Standard Process Uses These 5 Applications:

Creating Map Layout
Digitizing Map Layers
Registering Images
Exporting Map Layer EPS
Editing Vector Layers

Stacking Bands
Reprojecting
Subsetting Images

Associating GeoReferencing
Files with Stretch

Histogram Stretch
Matching Contrast
Patching Mosaics

Assembly
Annotation
Export to Tiff



Most of these functions can be acceptably accomplished with **ArcGIS**:

Creating Map Layout
Digitizing Map Layers
Registering Images
Exporting Map Layer EPS
Editing Vector Layers

Stacking Bands
Reprojecting
Subsetting Images

Associating GeoReferencing Files with Stretch

Histogram Stretch
Matching Contrast
Patching Mosaics

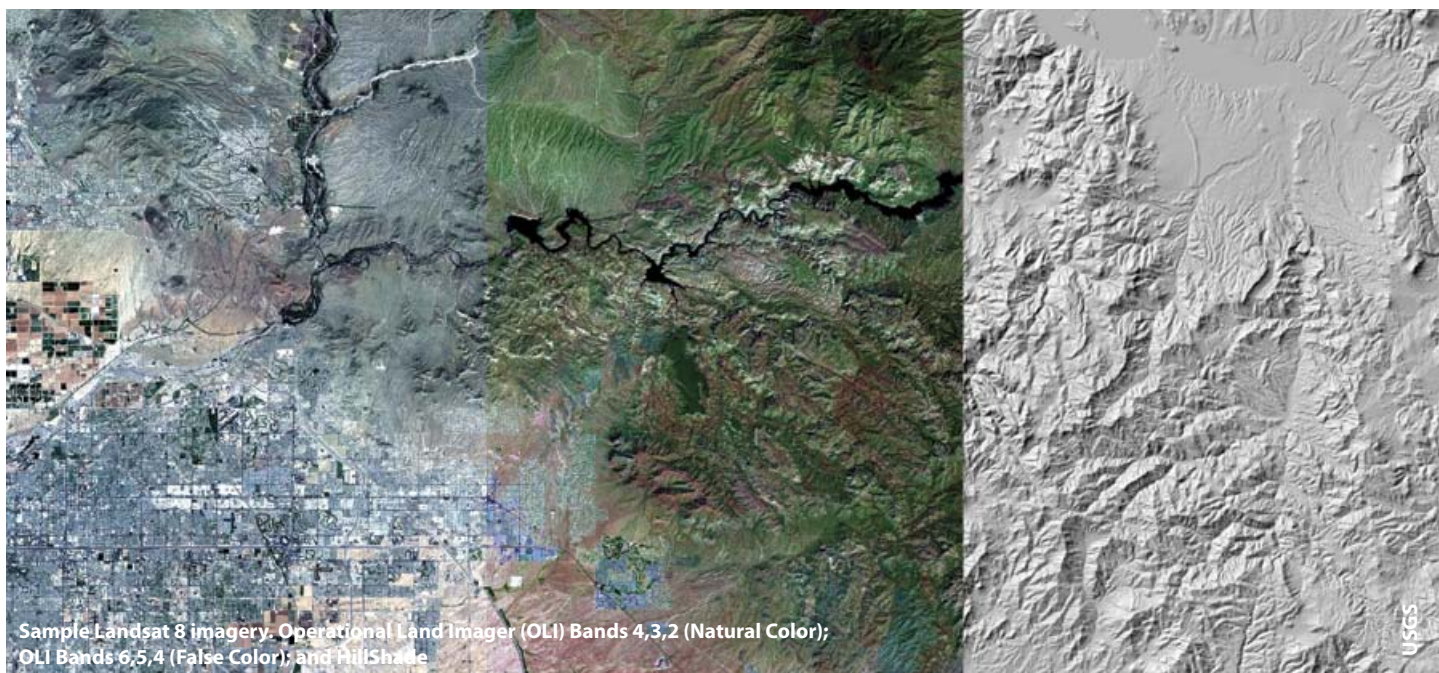
Assembly
Annotation
Export to Tiff



several applications for most sites. The standard applications we rely on, and the functions they serve, are described here.

These applications are very useful and should be used if possible.

The most fundamental application is ArcGIS and can acceptably accomplish most all of the needed functions for producing these change pairs.



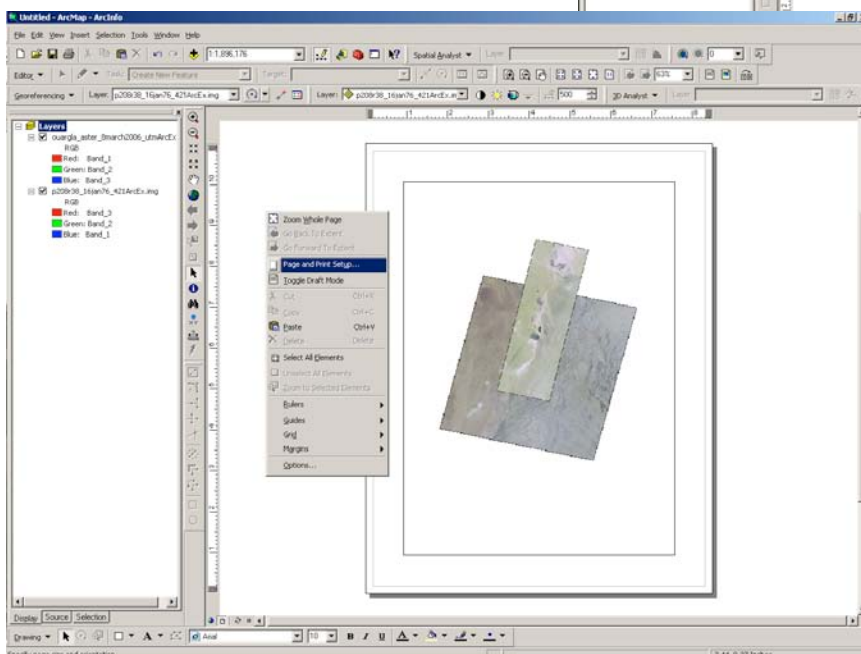
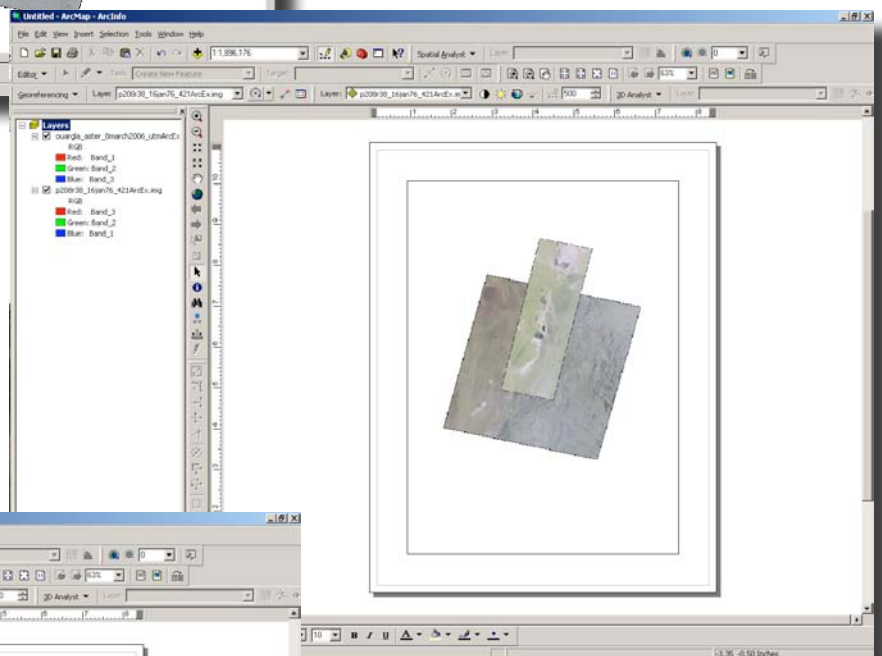
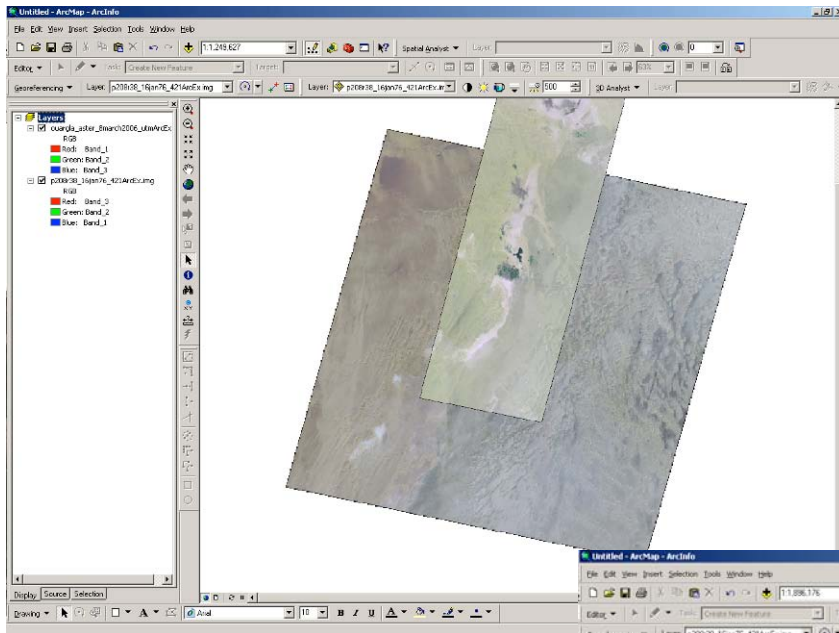
Sample Landsat 8 imagery. Operational Land Imager (OLI) Bands 4,3,2 (Natural Color); OLI Bands 6,5,4 (False Color); and HillShade

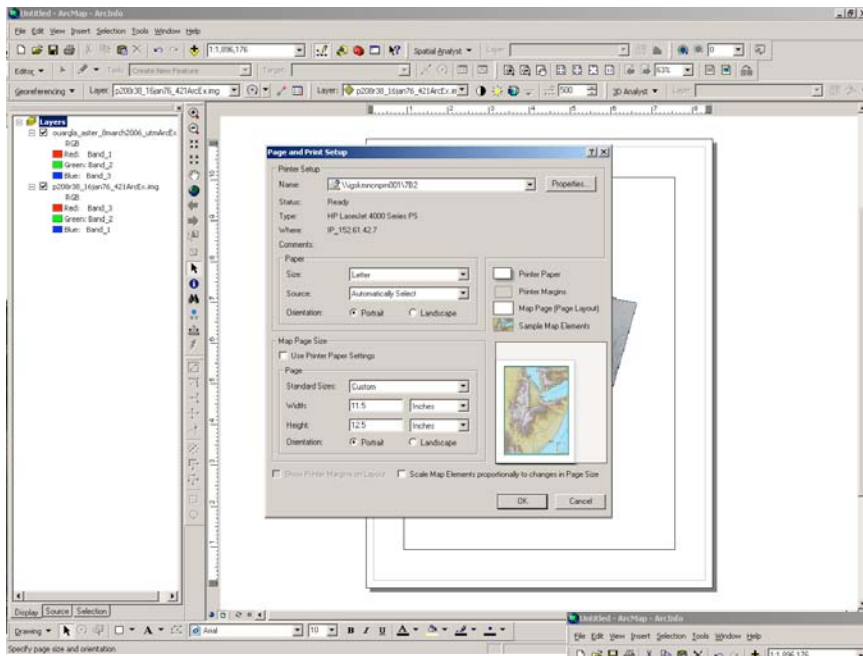
It is beyond the scope of this document to teach the use of each of these applications for all possible situations. For the most processes described below, a simple approach is provided. Alternative approaches can be

used in the course of producing a variety of sites with different data. The following process for creating a subset of an image and producing a 3 band (RGB) geotif is simple and will work in most situations.

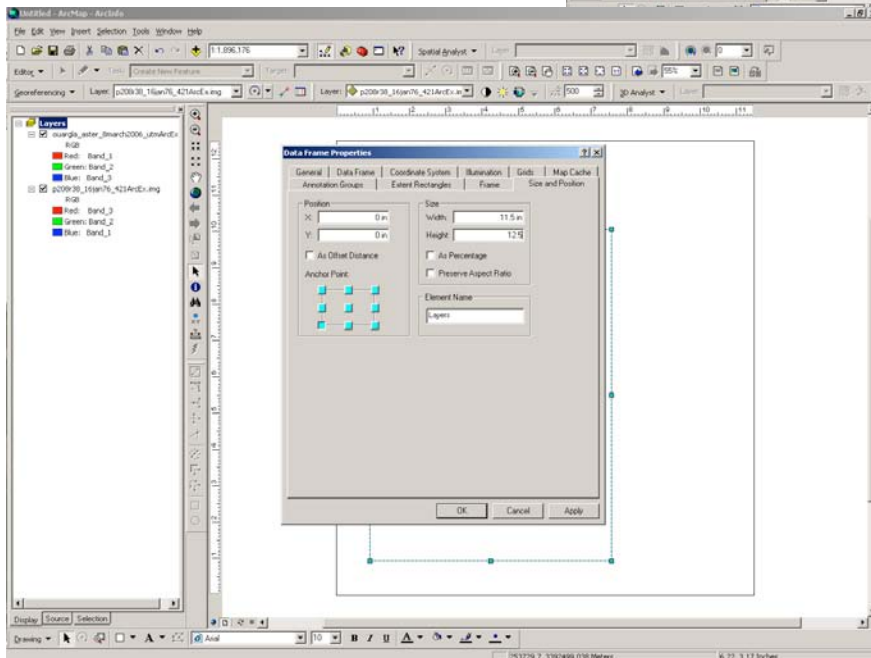
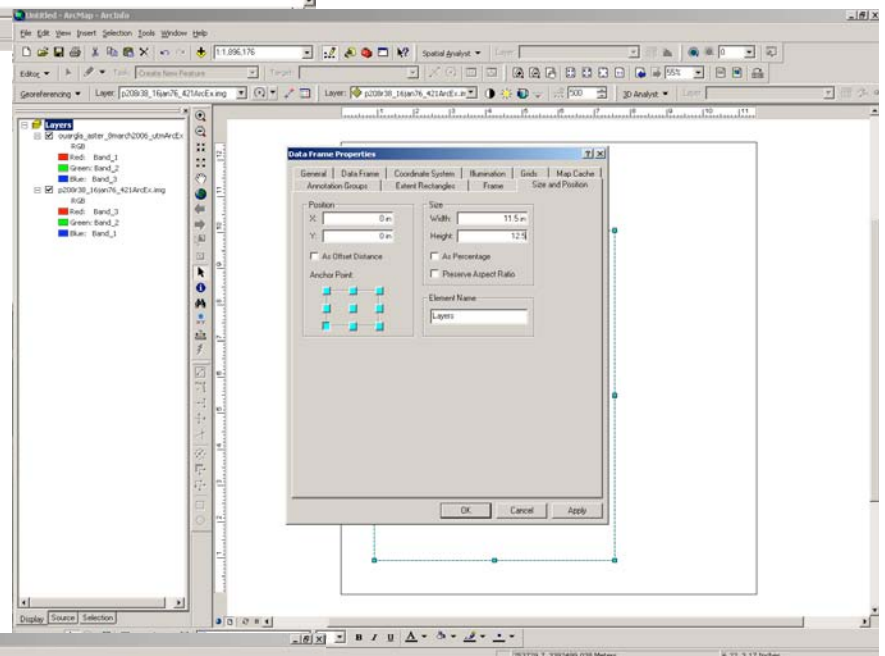
Subset the area of interest

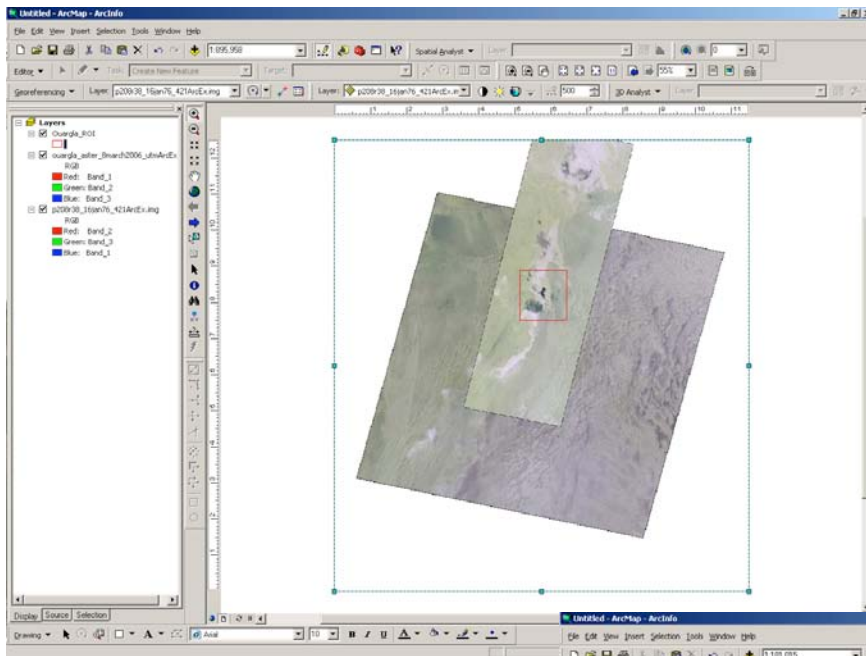
1. Add each image for the change pair analysis into a new map document in ArcMap. Display the bands as previously decided (see band selection above).
2. Switch to the Layout View and set the map dimensions to 11.5 inches x 12.5 inches (width x height). To do this, go to File – Print/Page Setup and set the dimensions.



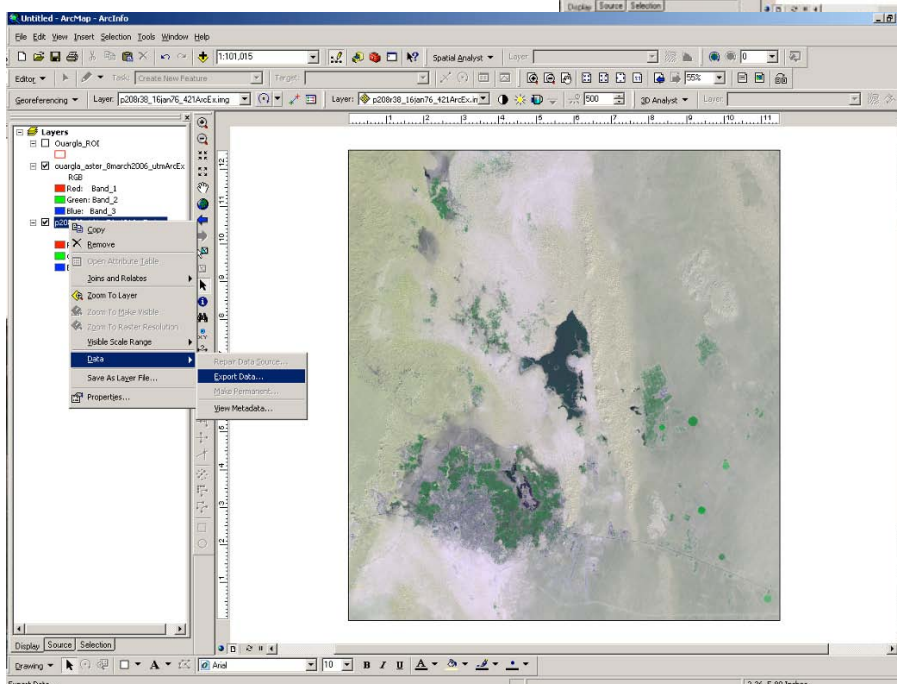
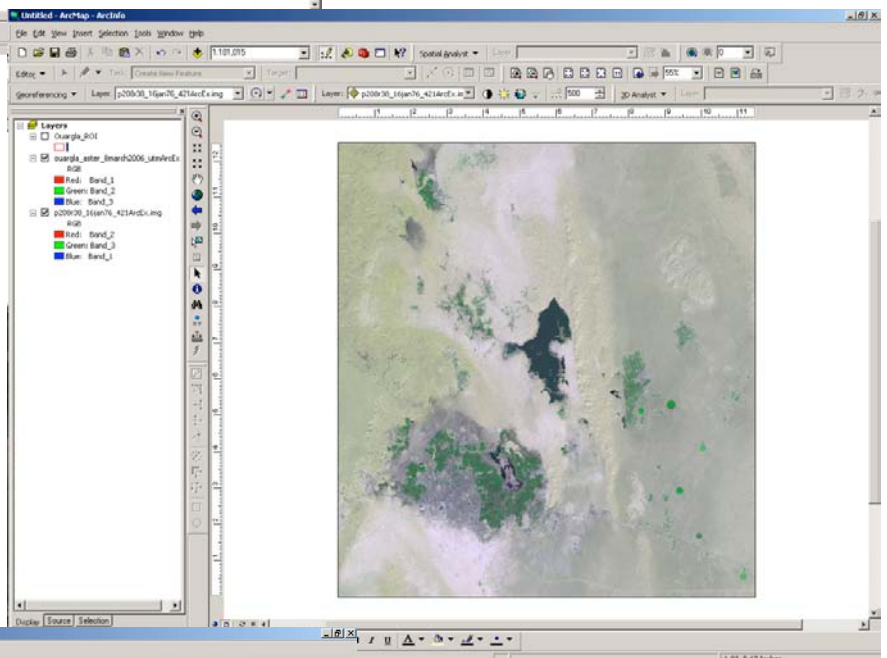


3. Set the Data Frame size and position to match the Page Layout: Right click in the Data Frame and select Properties - Size and Position tab - set x and y position to 0 and Size to the same dimensions as the data frame (11.5 inches by 12.5 inches).





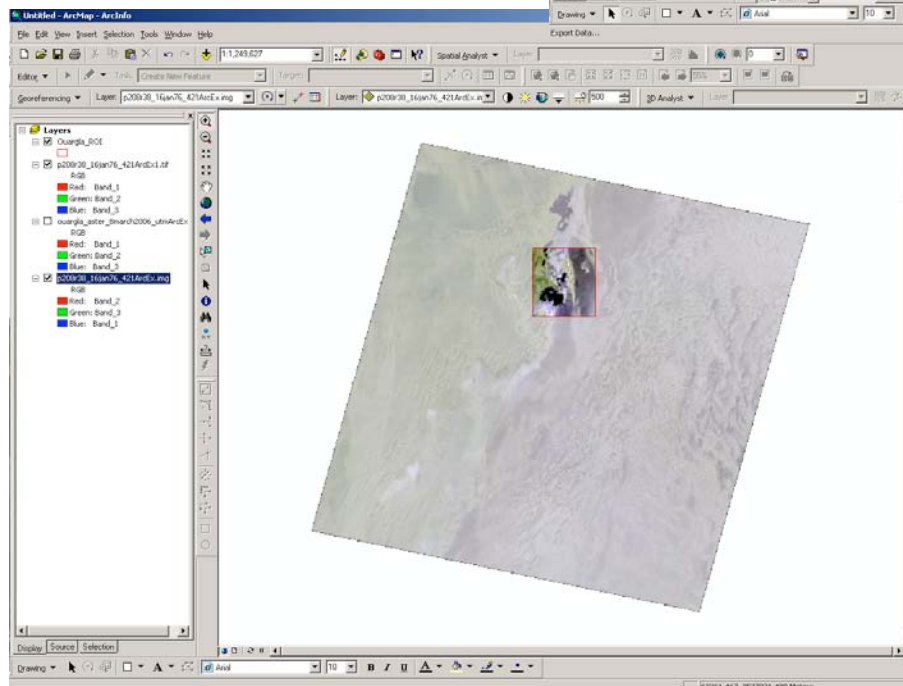
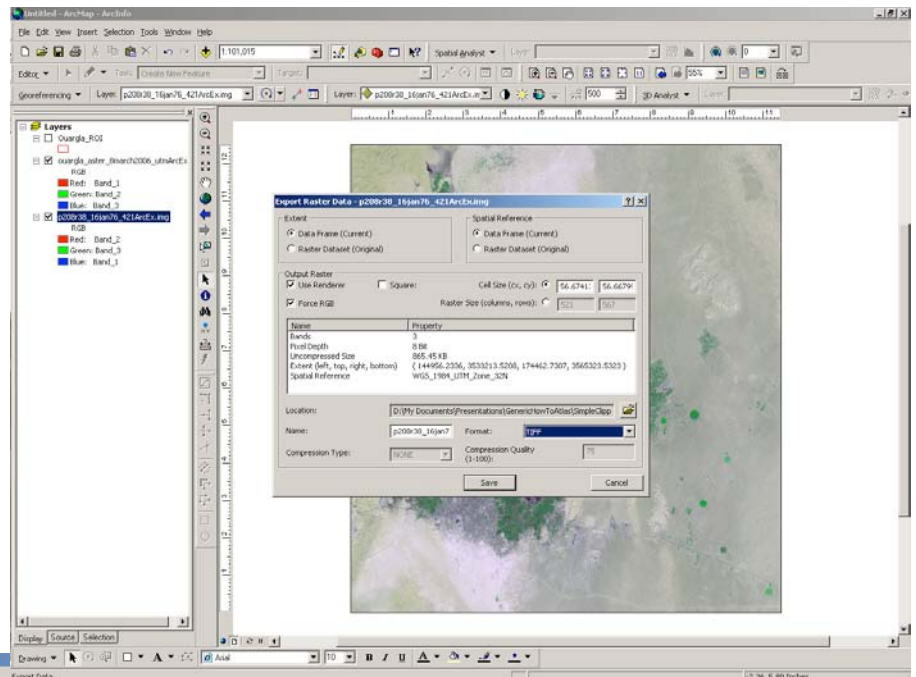
4. Zoom into the area of interest and create a vector polygon shapefile of the area to preserve the zoom level and extent if desired.



5. In the Table of Contents, right click the data layer for one of the images, go to "Data" - "Export Data".

When the dialog box opens, choose the following options:

- Extent = "Data Frame"
- Spatial Reference = "Data frame"
- Select the box next to "Use Renderer"
- Select the box next to "Force RGB"
- Choose location to save to and name of new file
- Set TIFF as the format
- Select "Save"

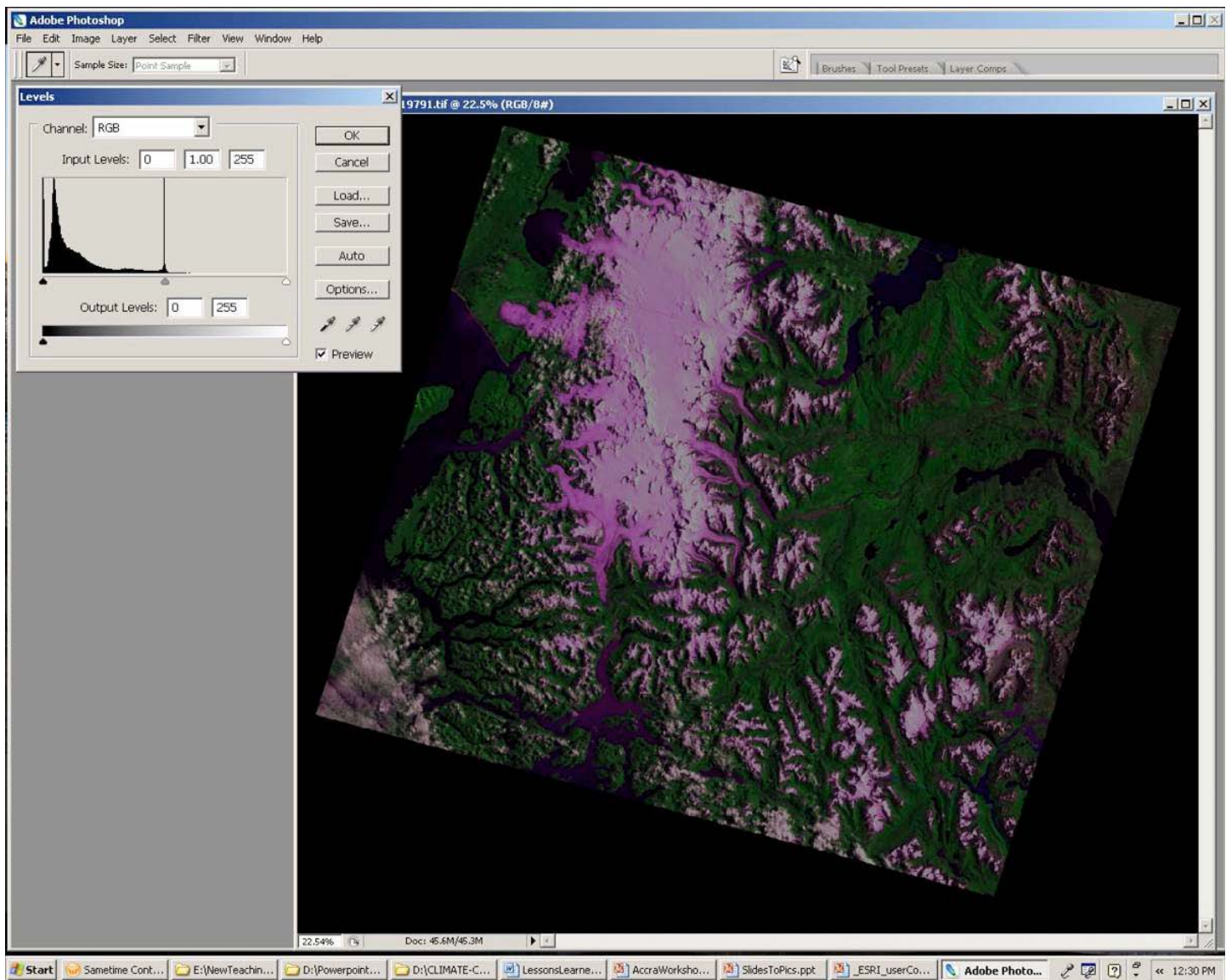


Once the process finishes running, you will have a subset RGB image of the region of interest. For easy access later, use the following naming convention:

Ouargla_16Jan1976_roi_rgb.tif
 <site name>_<image date>_<roi for region of interest>_<rgb for red green blue colourspace>.<image format>

Repeat the above five steps for each of the images using the same extent and scale from the map-view to create matched subsets of the image. These will often need adjustments for contrast, brightness and saturation to make them more comparable and easier for the layperson to understand. This can be accomplished in

ArcGIS if you do not have Adobe Photoshop available, but Photoshop is much easier to work with for this process and is highly recommended. This is one of the main reasons that 3 band RGB subset images should be created, but not the only one.

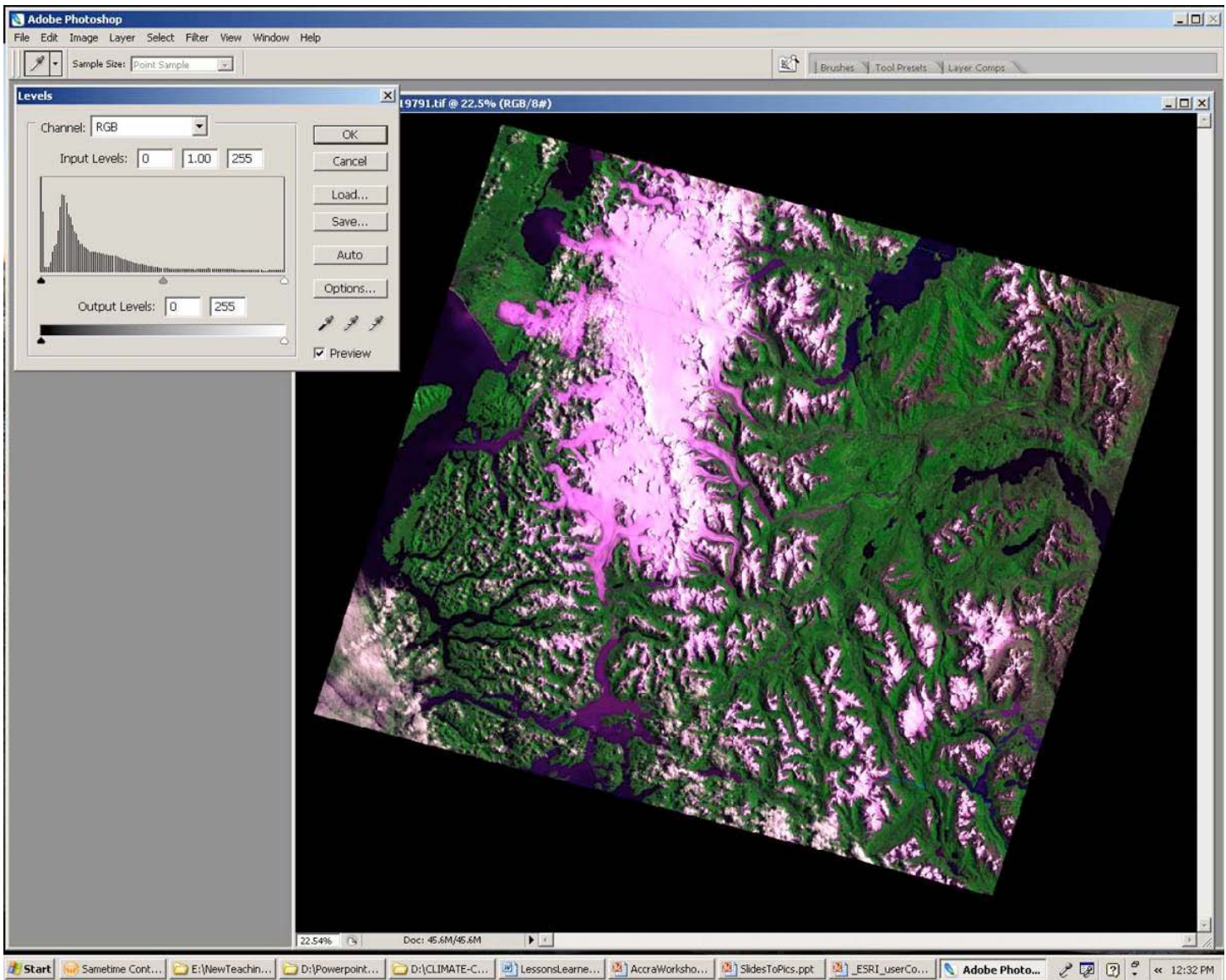


Stretching the Image Histograms

Remote sensing images are collected with sensors designed to capture brightness values from the barely visible to extremely bright. However, most of the pixels in an image have values that fall in the middle or lower middle of this range of potential values. If lumped values are displayed on a computer screen or in a printed image without having been redistributed across the full brightness range then the output image can often look like the one below:

As you can see, the histogram is showing almost all of the pixels falling below the 50 per cent brightness

value at the center of the histogram. **By redistributing the range of values across the range in which the majority pixels fall, the image is much easier to interpret (see image below). This is done automatically in most remote sensing and GIS software by applying a standard deviation stretch.** While a standard deviation stretch is often optimal, it is based on the statistics of the image which may include areas of water or clouds which distort the statistics and therefore create an unacceptable stretch. By manually redistributing the histogram in Photoshop or ArcGIS, better brightness and contrast can be achieved. Also, images from different dates and sensors can be matched for brightness, contrast and to some extent, colour.

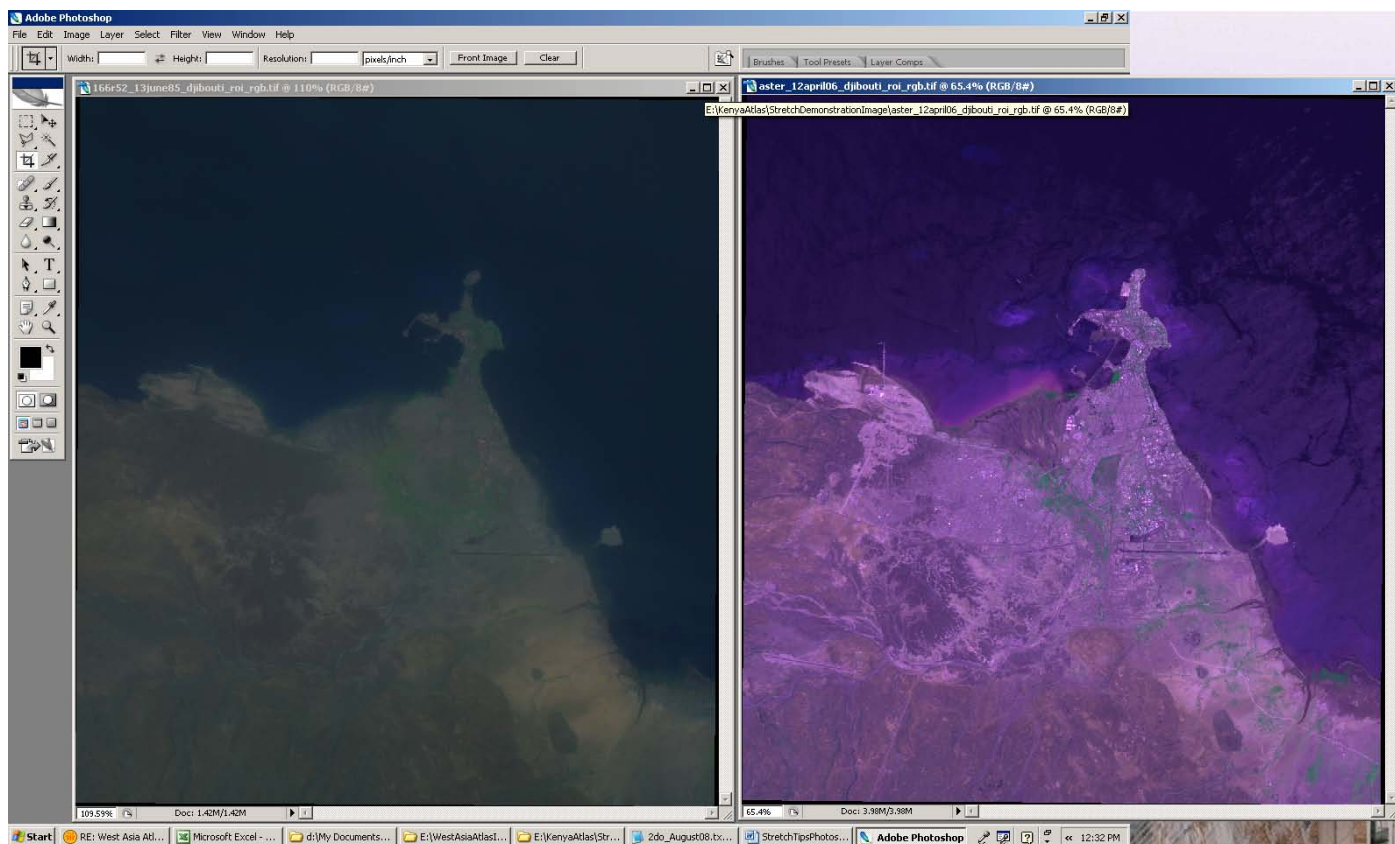


The histogram stretch can be further adjusted for colour saturation and brightness to achieve a more natural looking image. Be aware that careful judgment must be used to avoid distorting the content or interpretation of the image.

The following process describes how to complete the histogram stretch process in Adobe Photoshop. ,

Objectives:

- To make the images more intuitive for the reader/web user.
 - To “normalise” the images so that things which have not changed do not look like they have changed just because of differences in data source, atmosphere, etc.
 - To approximate the “transformation” used in Google Earth so that when the images are displayed in Google Earth they have a similar look.
 - To make the RGB to CMYK conversion for print and adjust if necessary to regain the look of the RGB.
1. Open all of the roi_rgb.tif images in the time series in Photoshop at the same time.

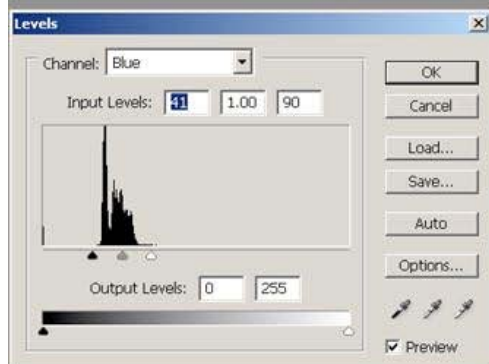


Individually adjust histograms of each band of the rgb layers.

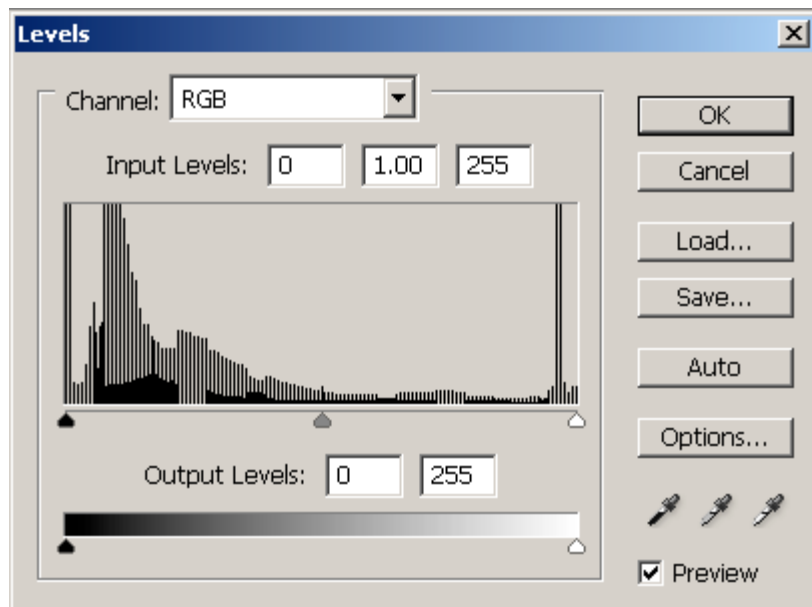
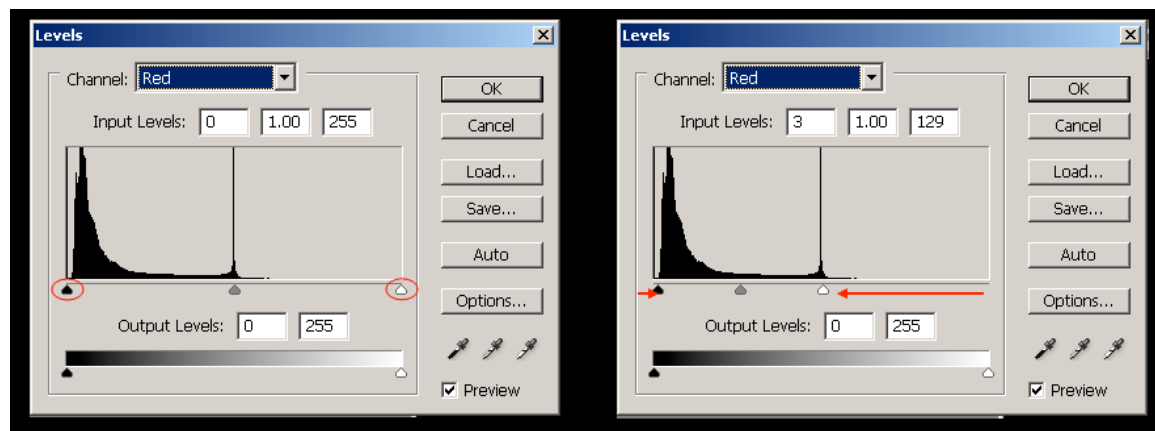
Image > adjustments> levels >

Generally the majority of the information will fall within a narrow distribution of brightness values. Moving the top and bottom values for display values in to that range will spread the various incoming values across a wider range of out values and make smaller differences in brightness more easily perceptible.

Blue

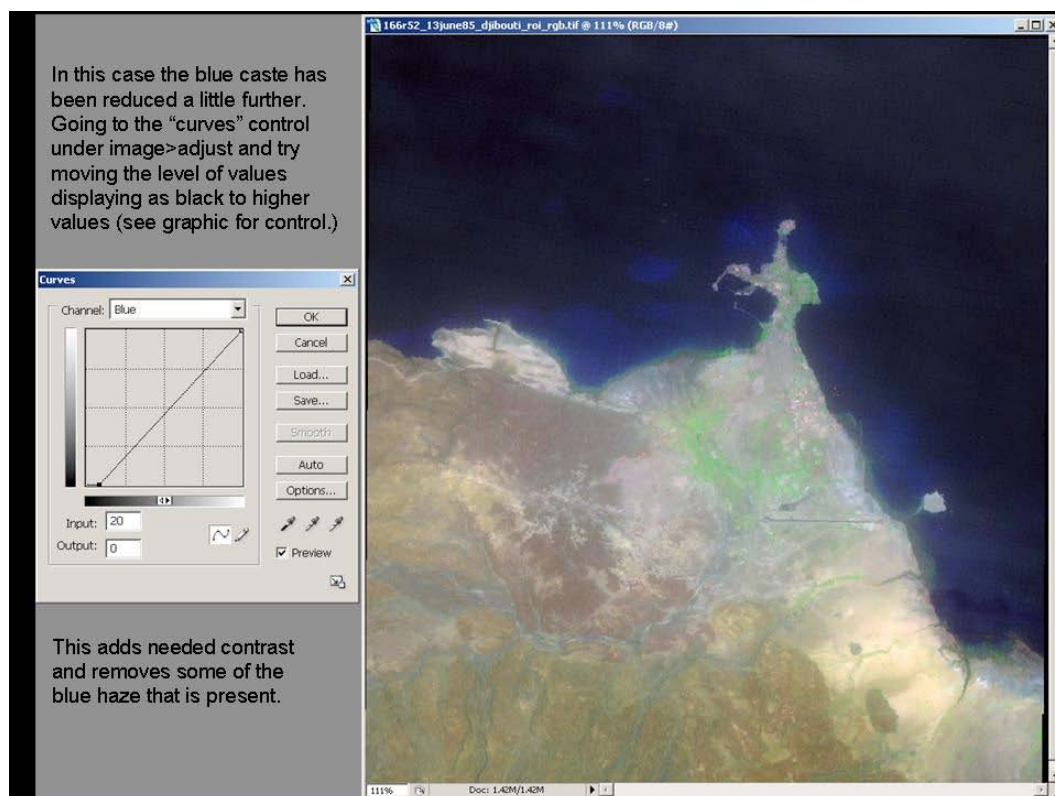


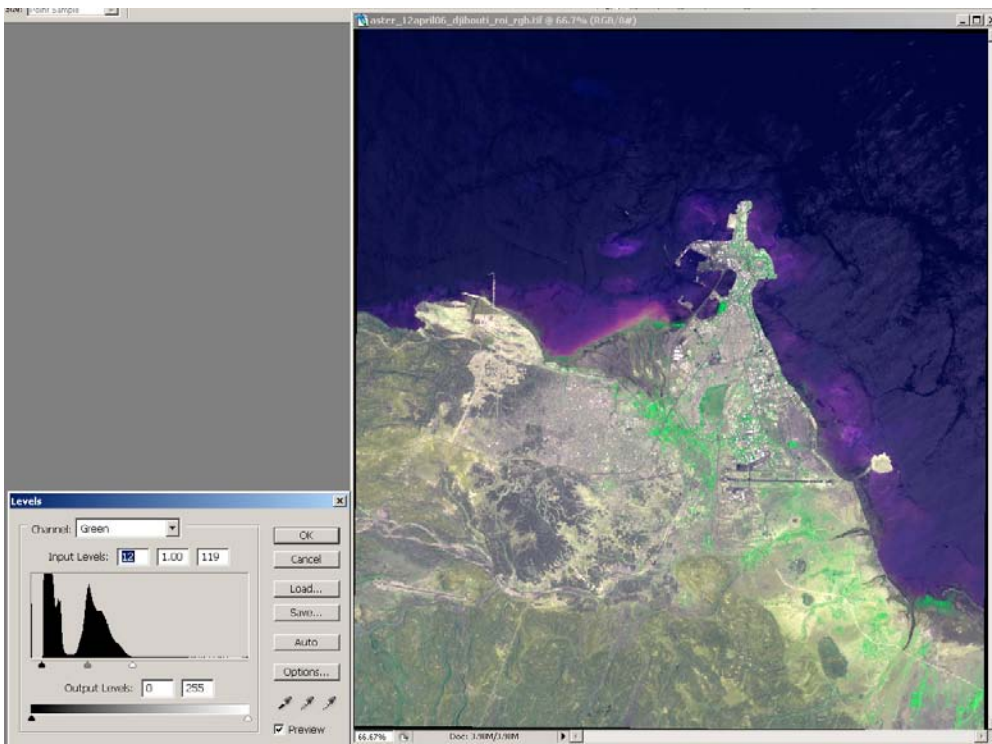
2. Open the Levels dialog box and set the Channel to "Red." Move the sliders to the upper and lower limits of the distribution where the majority of pixel values are located.



This histogram now shows the pixel brightness values distributed across the full range of the display values. Repeat this step for each band of each image.

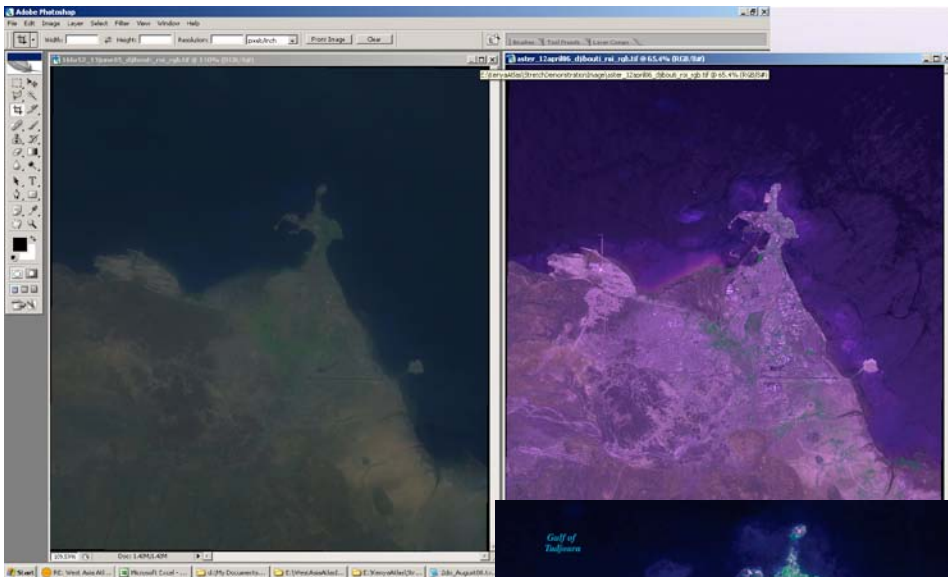
3. Once this has been done for all of the bands of one image, they can be readjusted to achieve a better colour balance. Open the Levels dialog box again and set the Channel to "RGB." Move the left slider to the right to darken and add contrast. Move the right slider to the left to brighten and contrast. Move the center slider to the left to brighten and reduce contrast, move the center slider to the right to darken and increase contrast.





4. When you have finished adjusting the levels, additional adjustments can be made to achieve better contrast and brightness using the “Curves” control and the “Contrast and Brightness control.”

BEFORE

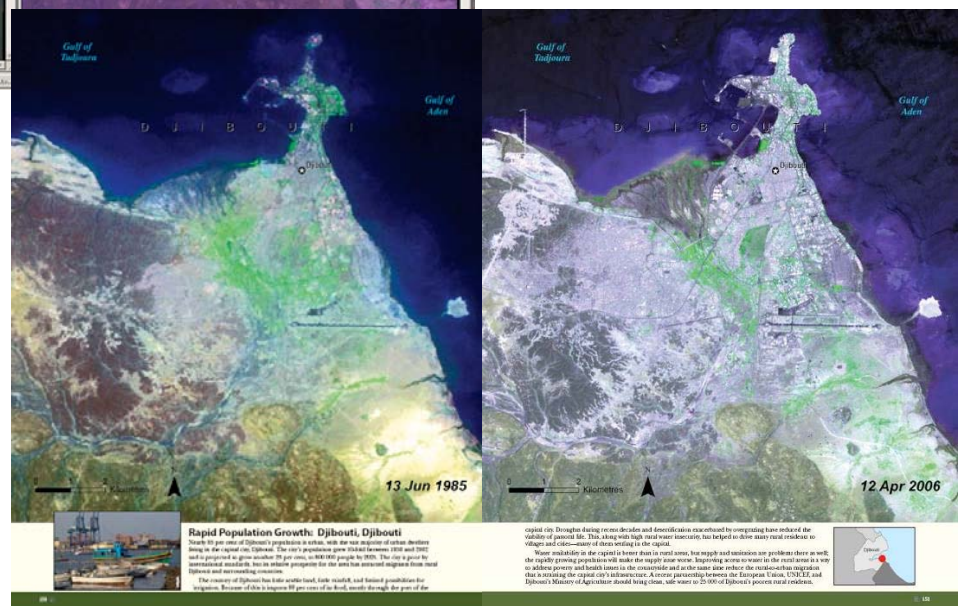


Repeat the above steps for each remaining image, attempting to achieve a relatively similar colour scheme. The end result should be images that have not significantly changed the interpretation of the image, but is much easier to compare for change.

AFTER

6. To save the stretched images, go to File – Save As and save the image with a new name. This will leave the original roi_rgb.tif unchanged.

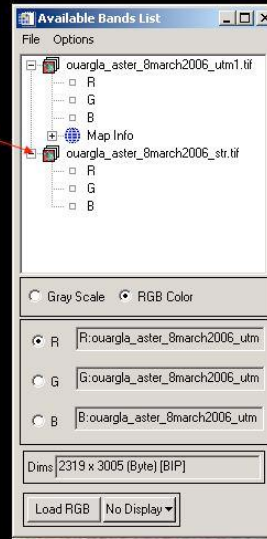
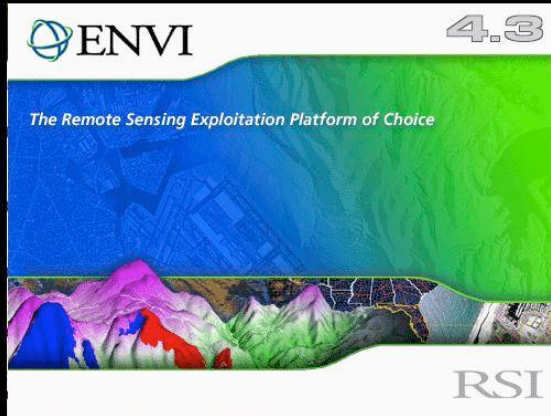
7. This new image will be exactly the same dimensions and number of pixels as its original, but will not have georeferencing information associated with it.



Please review the following graphics for additional assistance.

To re-associate the geo-referencing information with the newly created image:

Open the new "stretched" image in ENVI
Open the unaltered "rgb-roi" geotiff in ENVI
Right click the "Stretched" image
Choose "edit header"

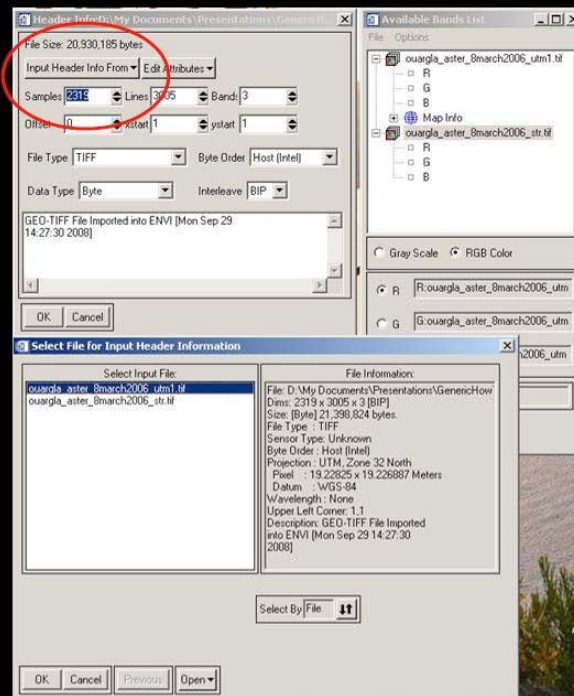


Georeference the new stretched image

To re-associate the image with the geo-referencing files you can do the following in ENVI. Similar functions should be available in any GIS or remote sensing applications and an alternative method is explained after this section.

1. Open the new "stretched" image and the unaltered "RGB-ROI" geotiff in ENVI
2. Right click on the "stretched" image and choose "edit header"
3. Choose "input header info from"
4. Select the geotiff then OK
5. Save the "stretched" image as a geotiff

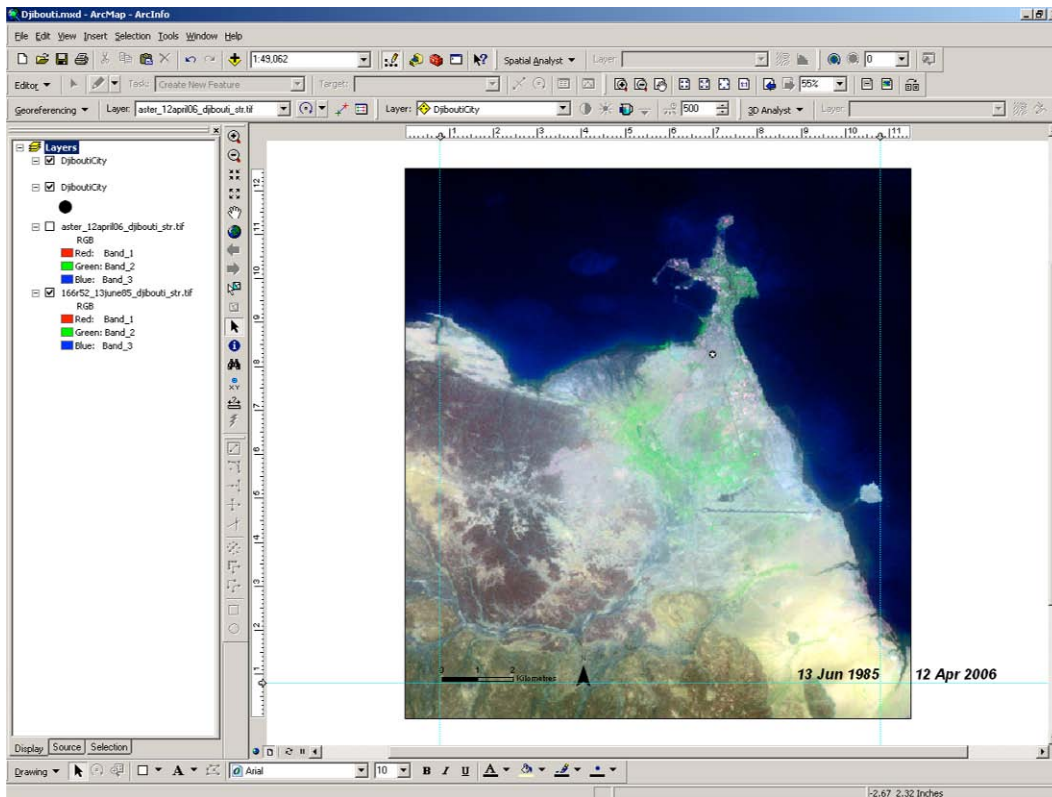
Choose "input header info from"



Select the geo tiff
OK

Then save the "Stretch" as a GeoTiff

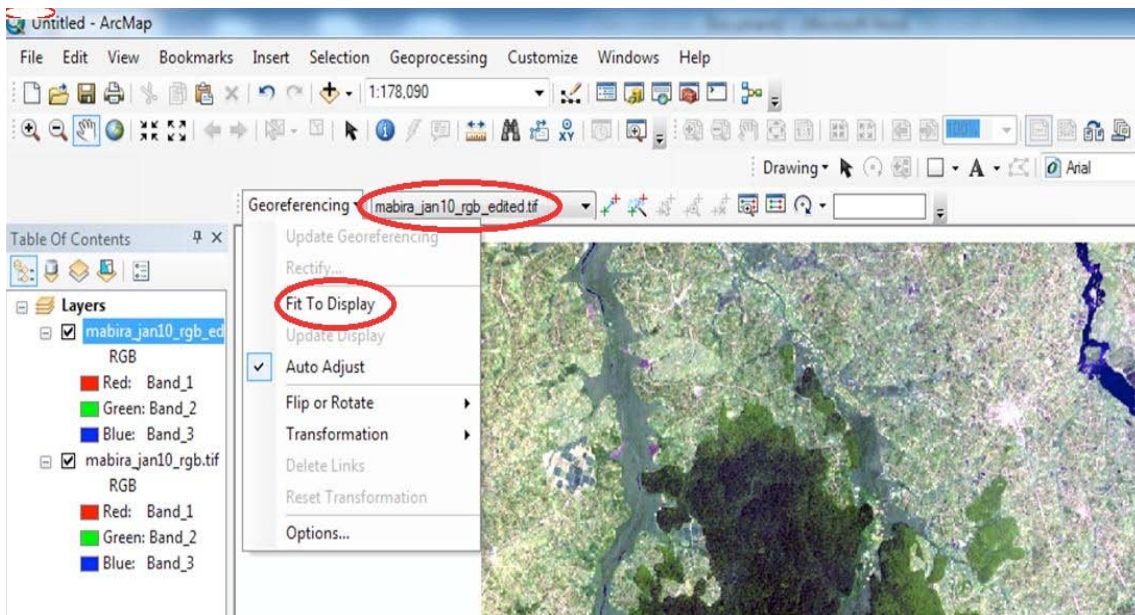
Please review the following graphics for additional assistance.



The stretched geotiff can now be taken back into ArcGIS where all of the desired map elements can be created and symbolised.

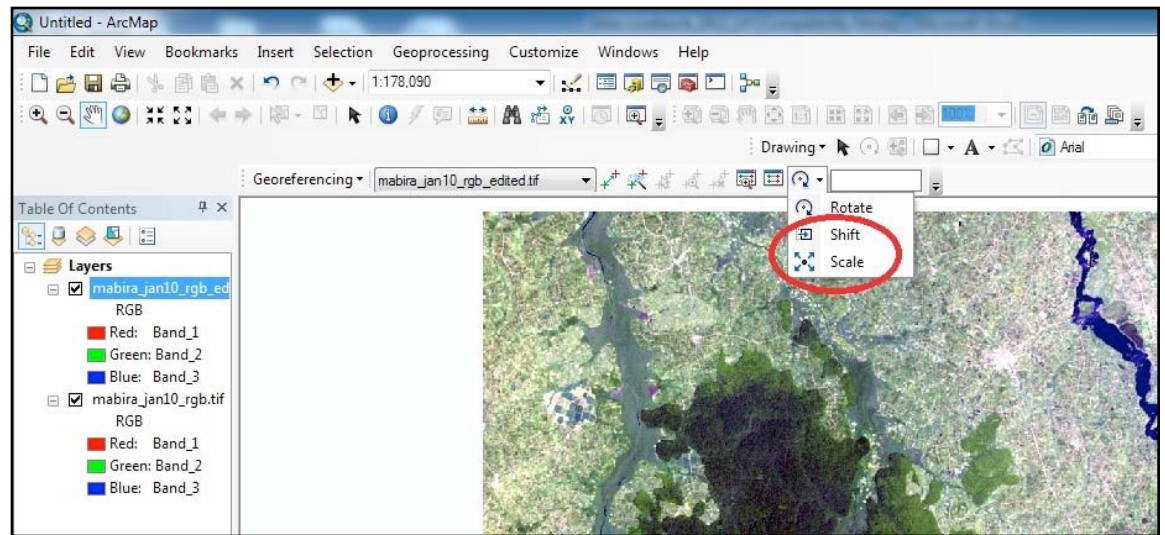
Alternative method for Geo-referencing

1. In ArcMap, add the original image (cropped to the ROI) that is georeferenced and the image that you altered in PhotoShop that is not georeferenced.
2. Display the Georeferencing toolbar by selecting the Customize menu then Toolbars - Georeferencing.
3. Make sure that the image you are georeferencing is selected in the Georeferencing layer drop-down box.
4. Zoom in to the approximate location where your image should be located.
5. On the Georeferencing Toolbar use the Fit To Display to move the raster dataset into the display.



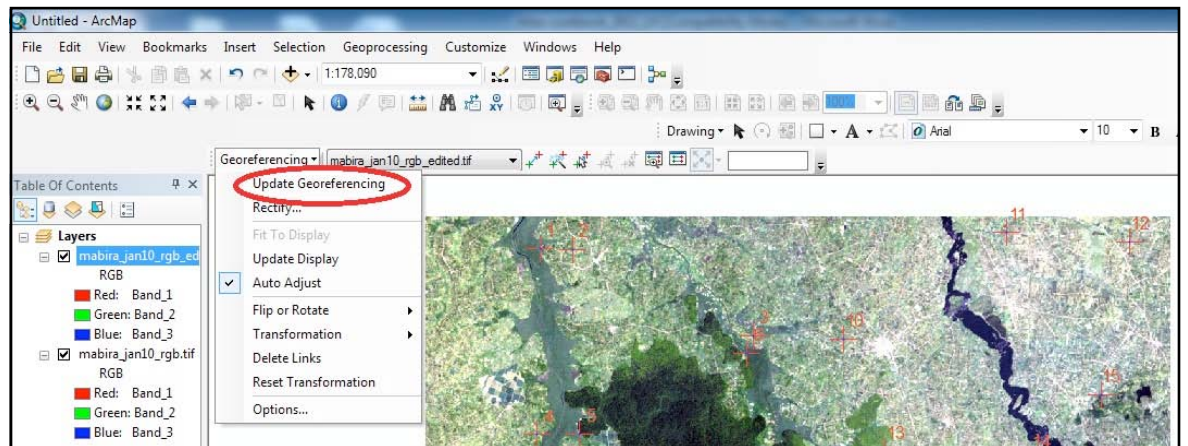
6. Use the Shift and scale tools to more accurately place the raster.

7. Select the Auto Registration icon.



8. In the Link Table, verify links that were created. If any links look inaccurate, then delete them and create new ones. If not enough links were created, then create more.

9. Select the Georeferencing drop-down menu and click either Update Georeferencing or Rectify. If you select Update Georeferencing, then the transformation information will be saved with the raster and its auxiliary files. If you select Rectify, then a new file with the georeferencing information will be created.

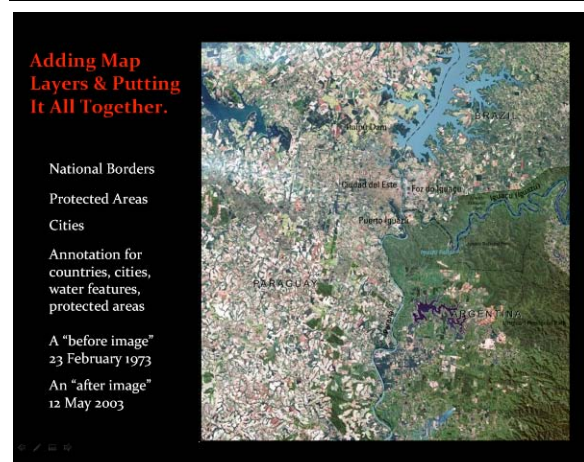
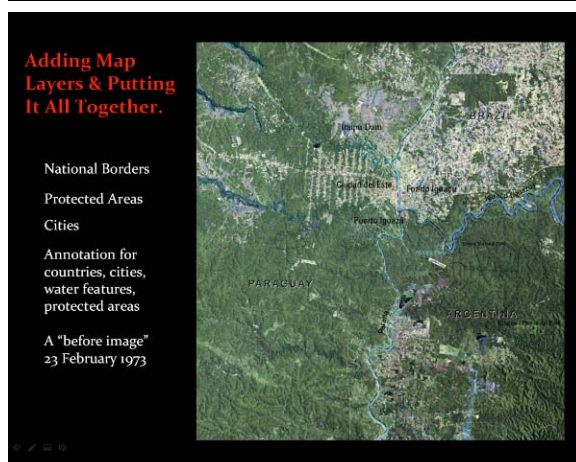
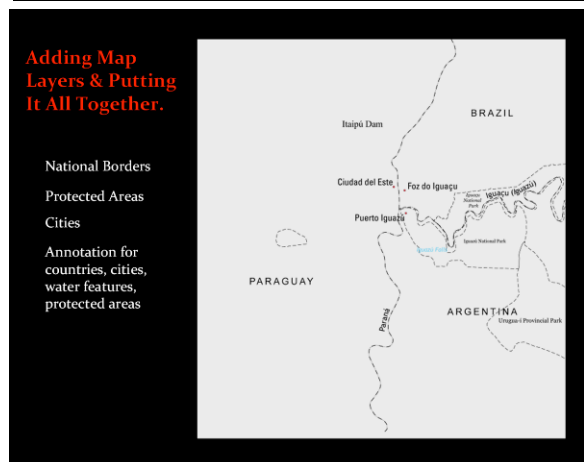


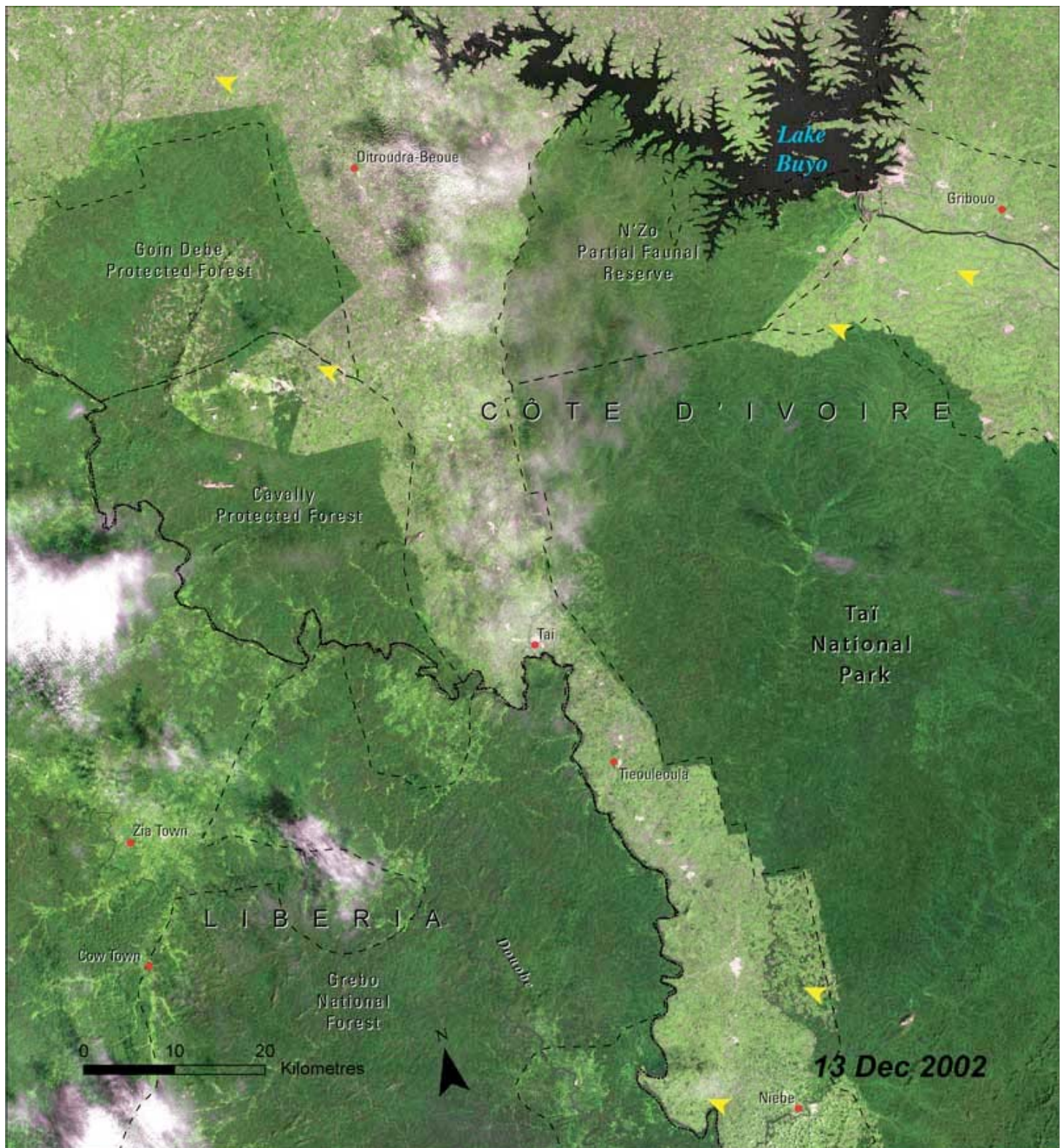
4. ADDING MAP LAYERS AND ANNOTATION

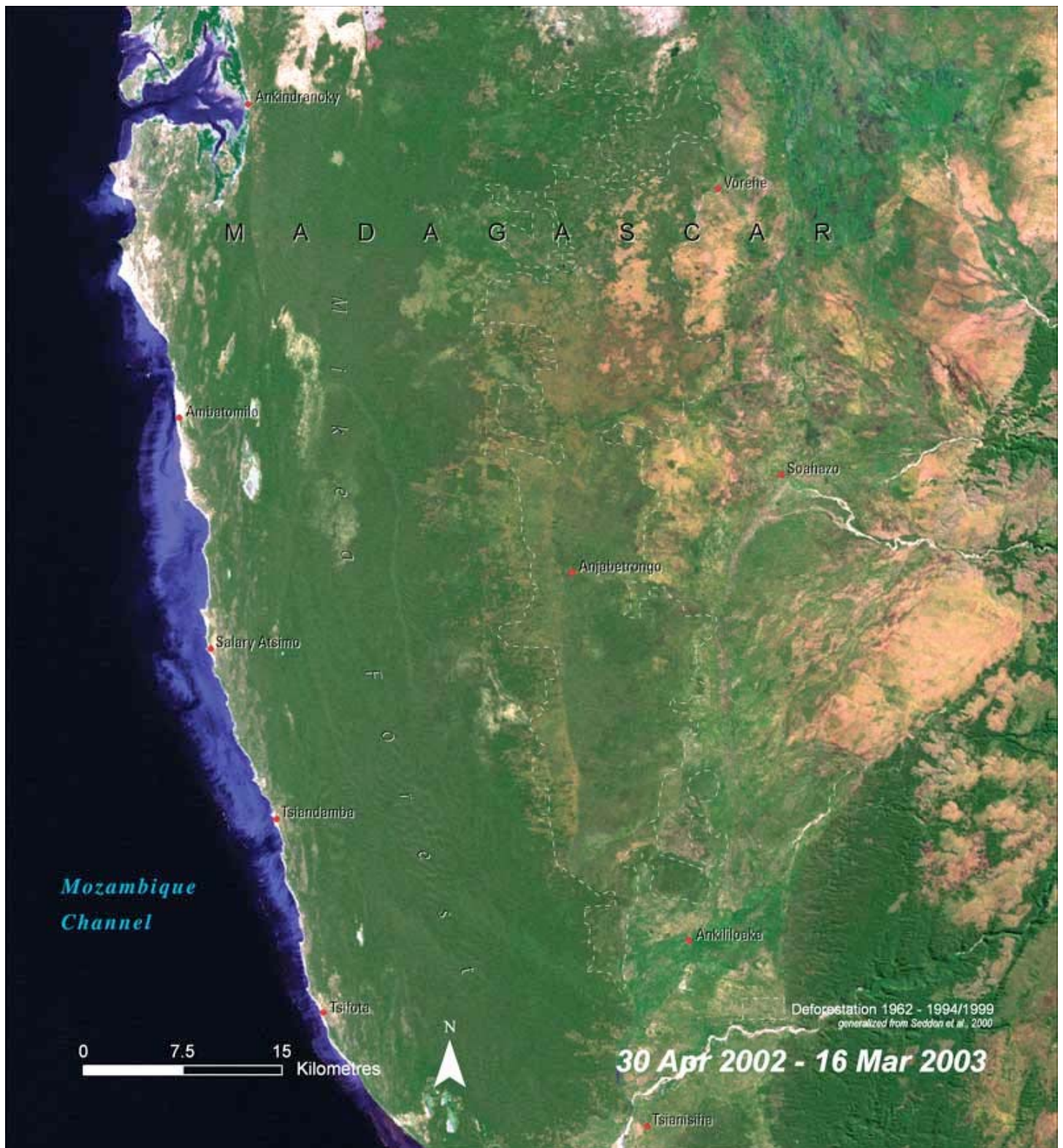
Creating Map Layers

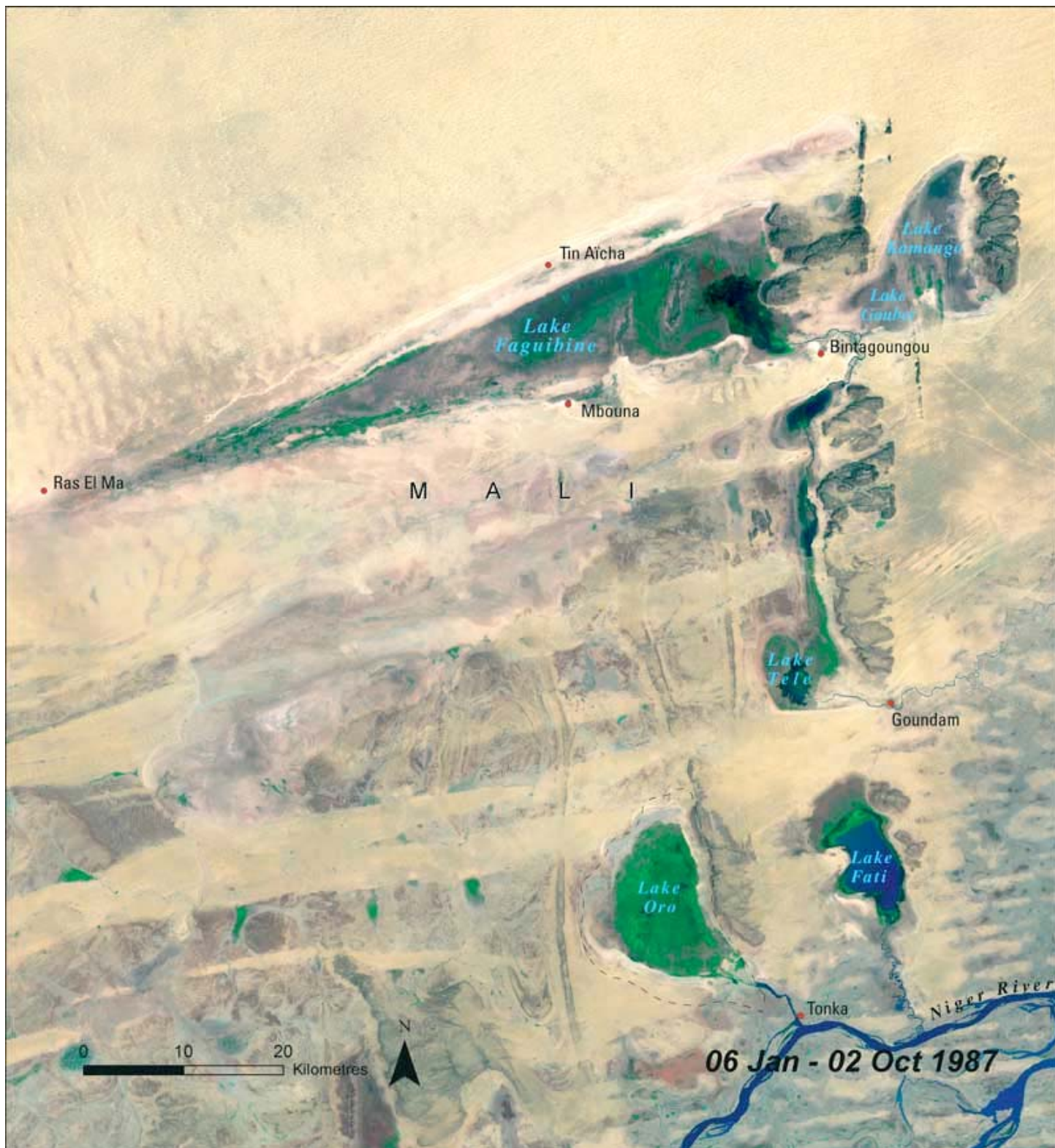
1. In ArcMap, add carefully selected map layers that help give context to the change pair and contribute to the overall purpose of the map.
2. Once the GIS map layers have been added, add the satellite images to give the time element to the presentation.

3. Begin to give meaningful symbology to the GIS layers that help explain the change pairs. Most of the details for symbolising standard elements such as north arrow, scale bar, date, administrative boundaries, etc. are given in this document. In addition, a .style file for use in ArcMap is available. The .style file provides easy access to many style standards. Review the previous publications in the Atlas of Our Changing Environment series to gain a sense of the style used and to see examples of similar features from which ideas can be taken. The images on the following pages give some examples of what final change pair images should look like.









Adding annotation

While annotation can be added using ArcMap, the best application for adding quality annotation is Adobe Illustrator. It takes some time to master the program, but if available, it is highly recommended. The process we will explain will allow for maximum editing and flexibility in the Illustrator file/document which can be a necessary step during the final edit phase, for updates in the future, other language translations, etc. Also, by using Illustrator changes can be made at the layout stage without backtracking all the way to the ArcGIS files since this program is used in design and print shops.

1. You will need to move the map contents from ArcMap to Illustrator. You will do this by exporting

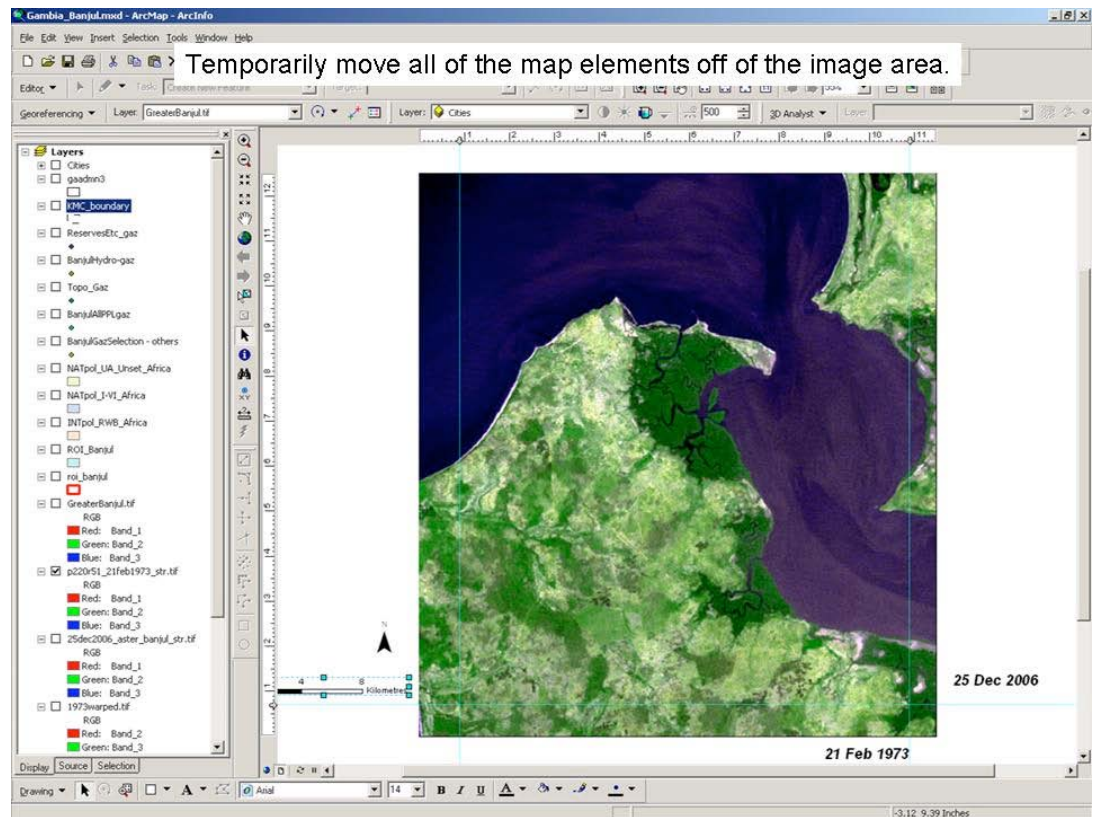
the map elements separately, but first save the map document so that you can return to the placement of all of the elements after you have exported the images. The naming convention we have used is:

<name of site>_<date of image>_ps.tif

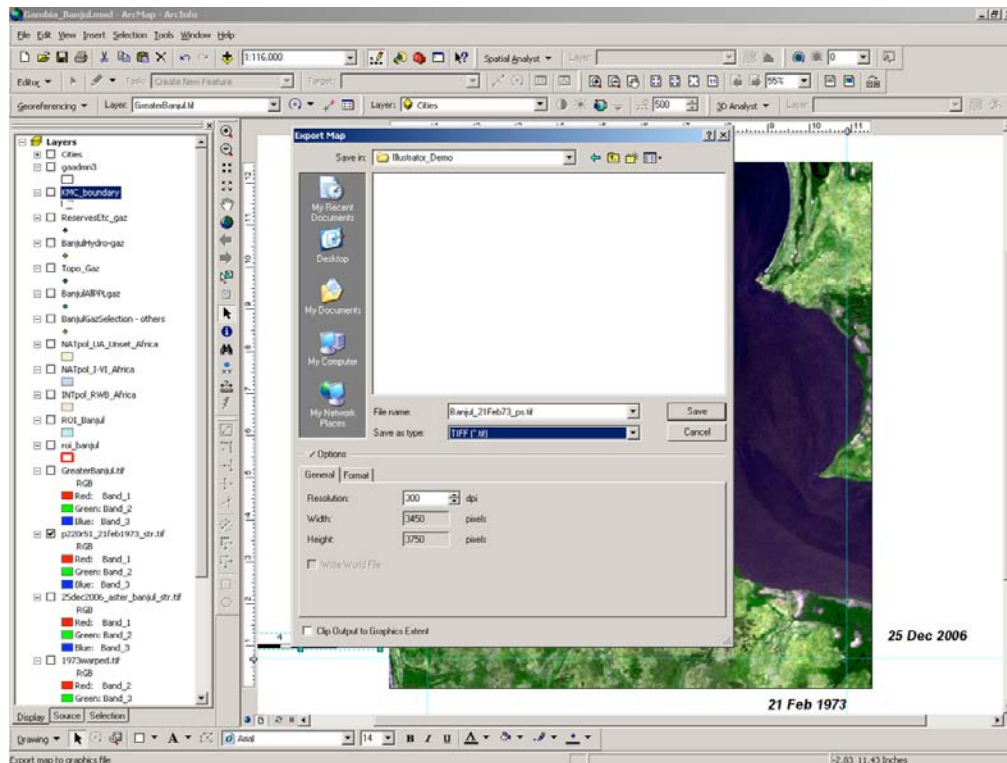
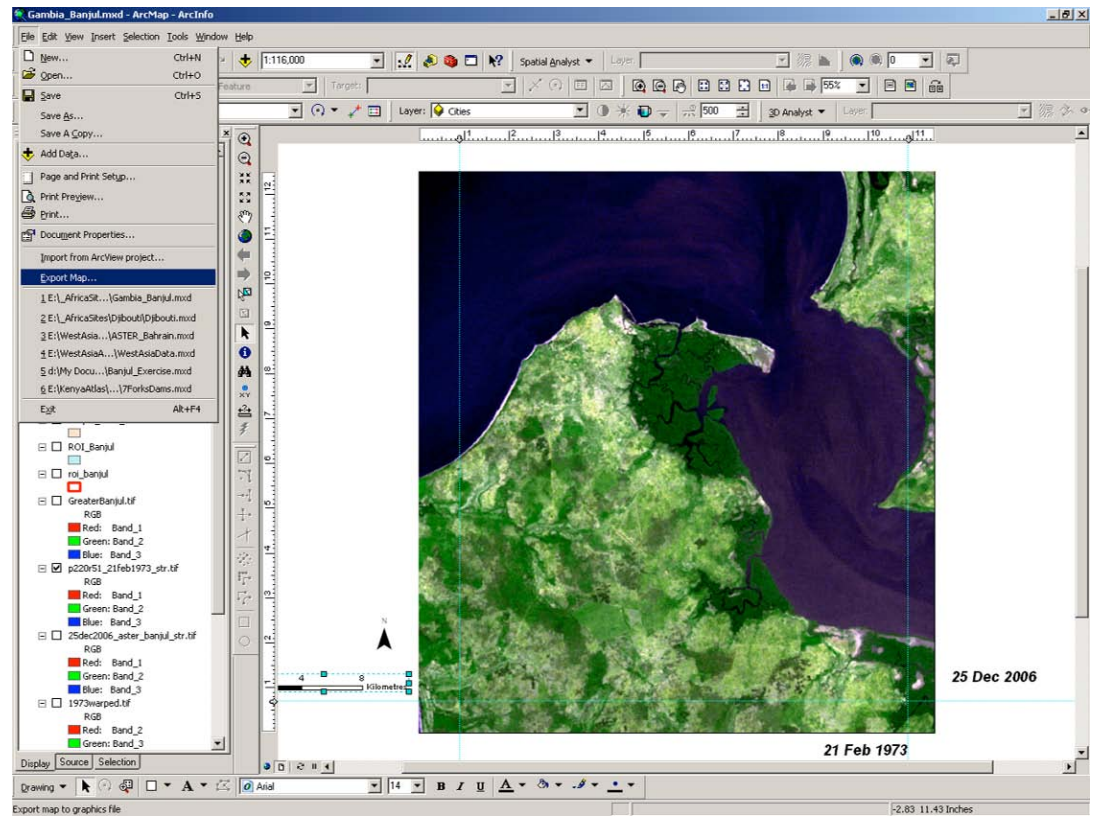
For example:

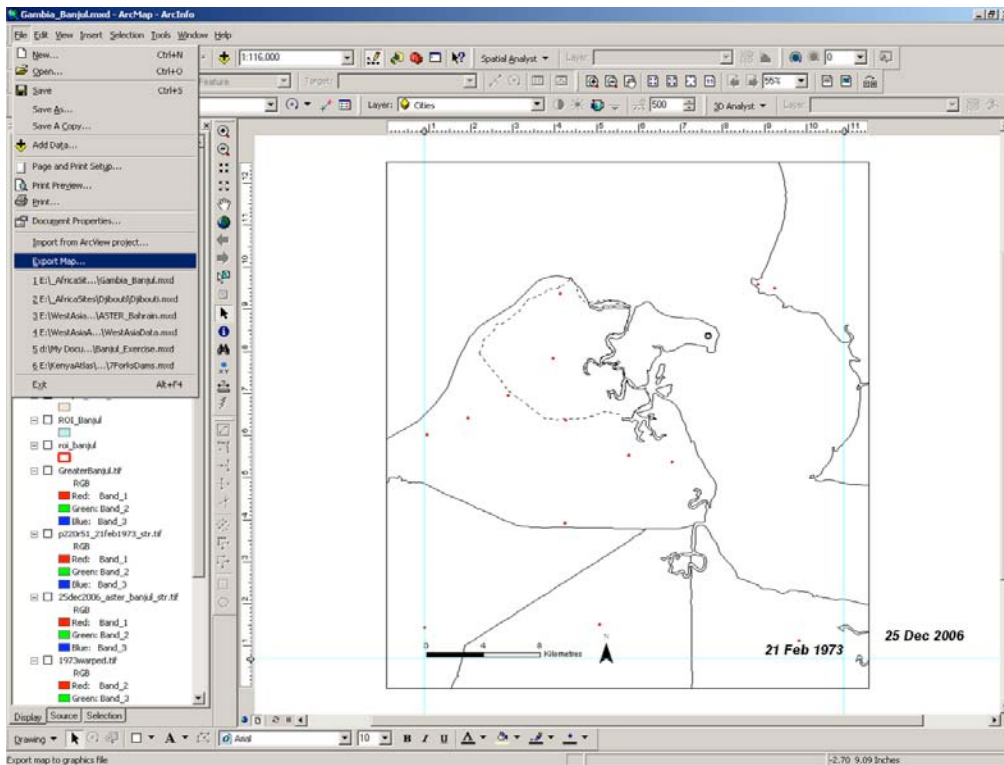
Banjul_25Dec06_ps.tif

2. Move all of the map elements off the page and turn off all of the map layers in the Table of Contents. The image should be the only layer left on.



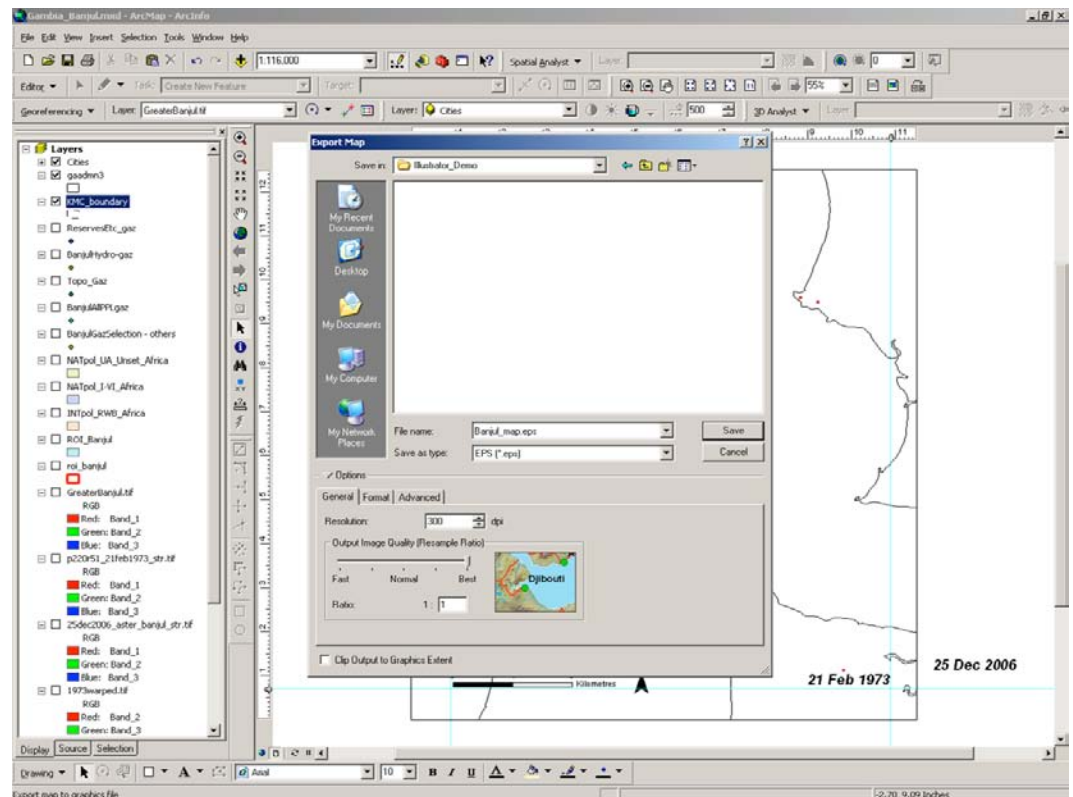
3. Go to the File – Export Map – Name the image – Save as TIFF – Set resolution to 300 dpi.



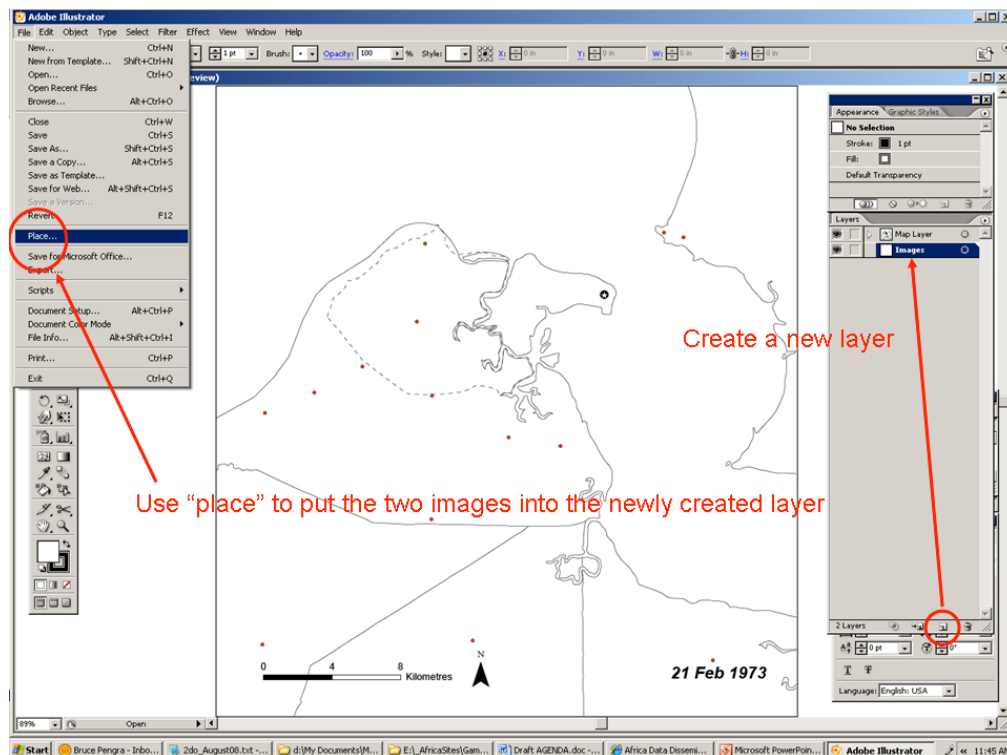
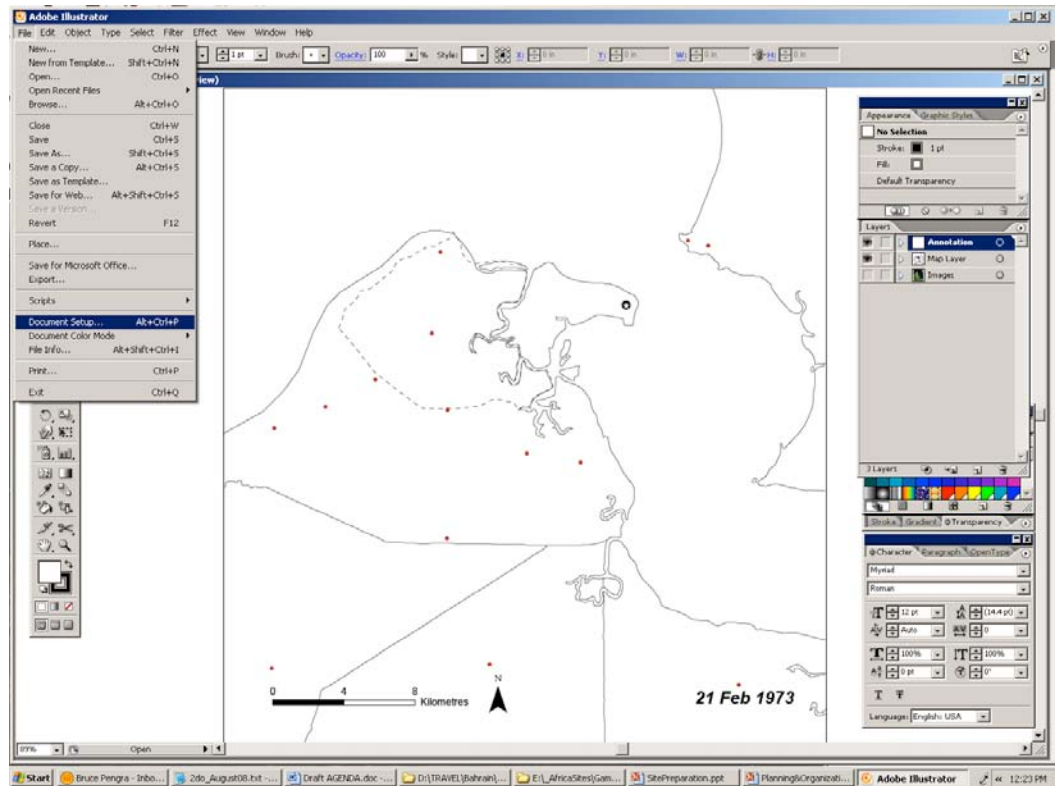


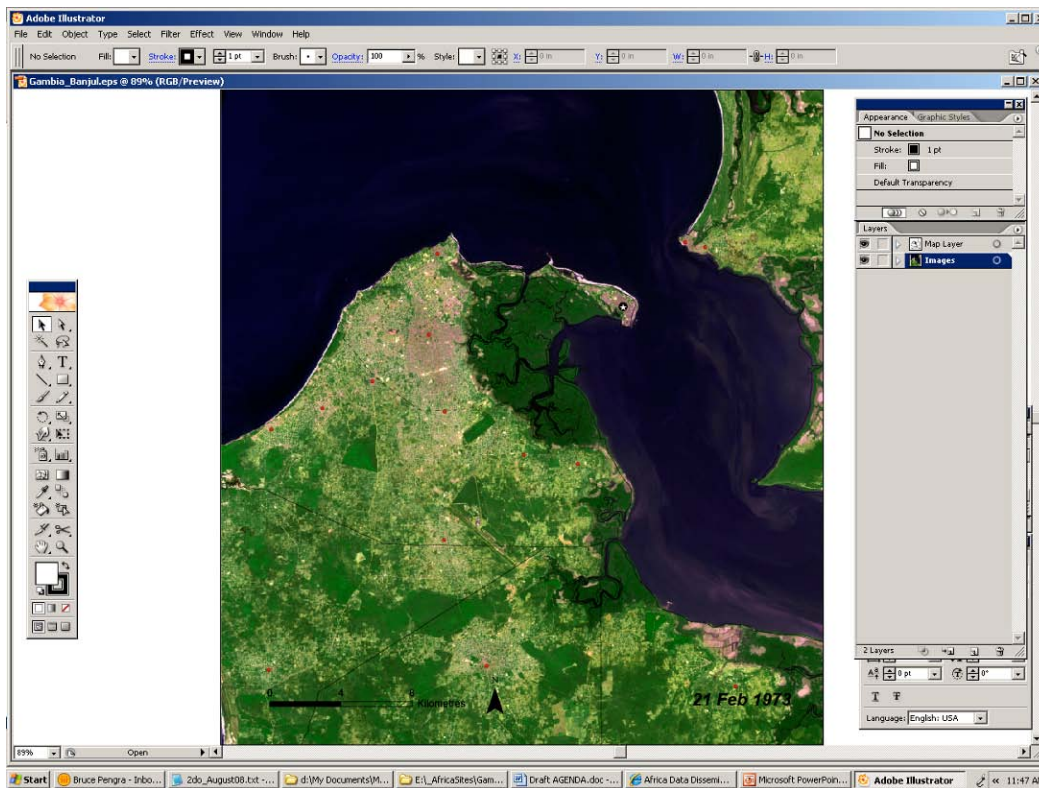
4. Close the program without saving and reopen it (this will give you back the map elements and settings that you had before you moved them to export the images.)

Turn off all the image layers so that the map and annotation layers are against a blank background as above. Go to File – Export Map – Create a name – Save as EPS – Set resolution to 300 dpi.



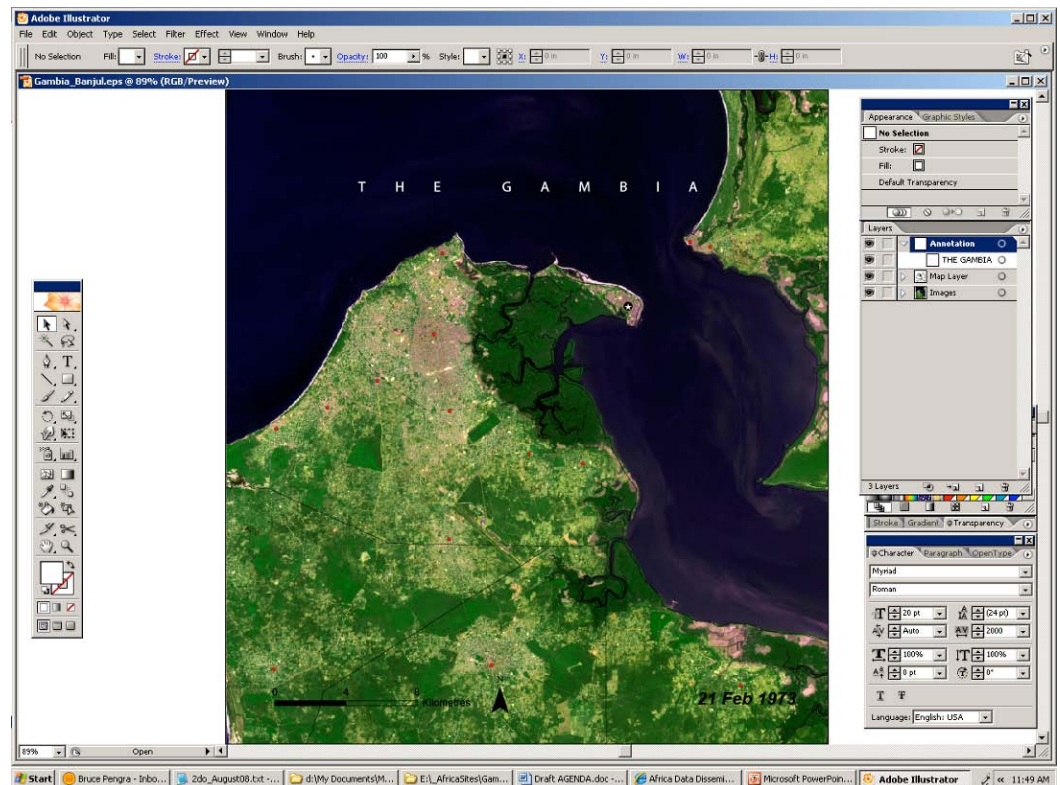
7. In the Layer dialog box, create a new “layer” for the images to be placed in.





8. Go to File - Place – and put the two satellite images (or however many for the change time series) into the newly created layer.

9. Add any additional annotation necessary following the style guide.





10. To save the final file, go to File – Export – TIFF – set resolution to 300 dpi.

You now have the final image product for the change pair studies. The TIFF versions cannot be edited but are the best compromise of quality and file size for the layout in Adobe InDesign.

Keep all of the elements from the Illustrator files in the data directory. It is very likely that they will need to be accessed again to make spelling corrections or other updates before the final version of the layout is done.

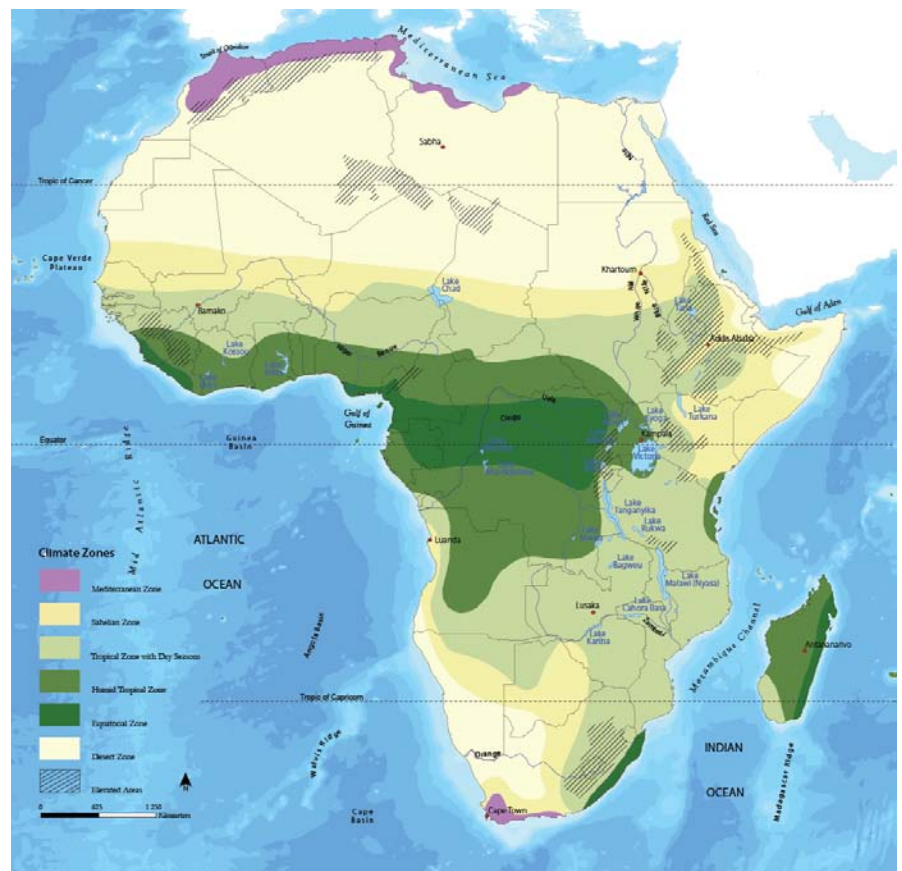
For publications in other languages, you can keep all annotation in English in one “layer” in Illustrator and all annotation in a second language in another “layer.” Then by simply turning off on layer and turning on the other you can export the map in either language as needed.

Maps

Maps should be clear and understandable without the use of long text explanations. Political borders should be shown where they provide important information or context to help the reader understand what they are reading/viewing. Labeling of major cities, rivers, and lakes should also be considered, but again they should provide important information or context. Too many details will distract the reader from the subject that the map is intended to visualise.

The scale bar, map legend, north arrow and other map elements should be consistent where ever possible to create continuity throughout the book. The reader will benefit from not having to adjust to varying map symbologies. Style guides will vary some depending on factors which are unique to each atlas. A basic set

Example Map:



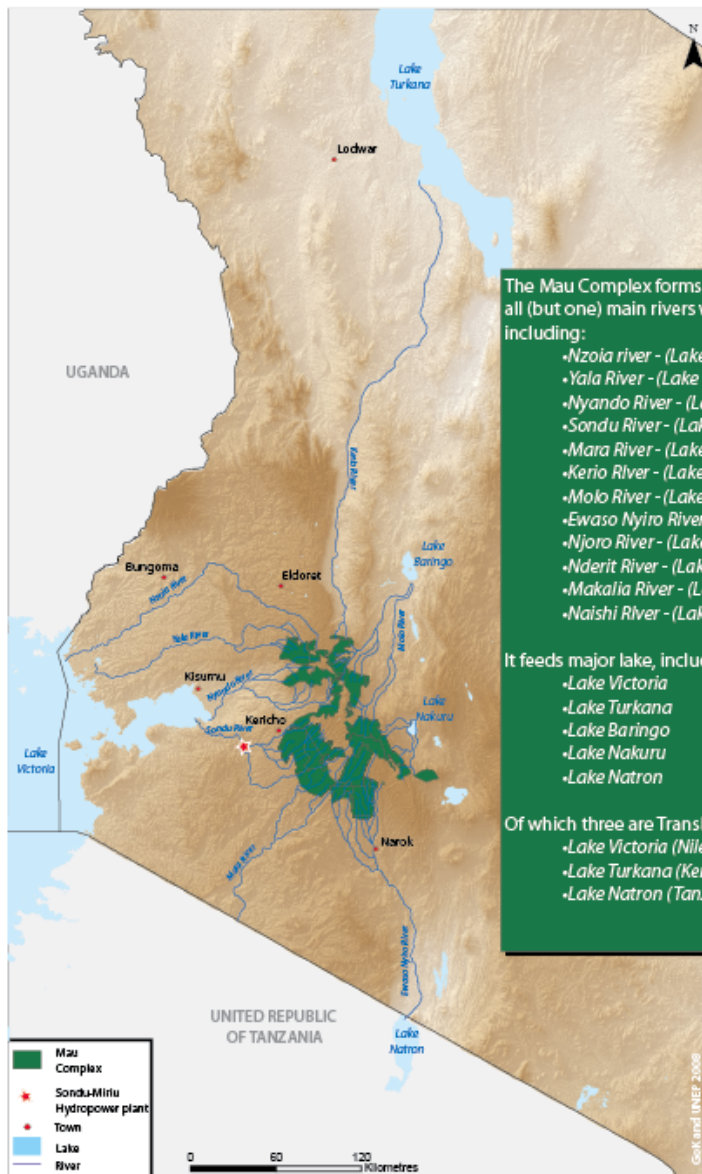


Figure 7: Critical water catchments, Mau Complex

The Mau Forest Complex

The Mau Forest Complex is Kenya's largest closed canopy forest ecosystem and the single most important water catchment in the Rift Valley and western Kenya. The Mau Complex forms part of the upper catchments of all but one of the main rivers on the west side of the Rift Valley. These rivers act as arteries carrying the Mau's

waters throughout western Kenya — from Lake Turkana in the north to Lake Natron in the south as well as to Kenya's most populous rural areas in the Lake Victoria basin.

The Mau Complex covering over 400 000 ha, is the largest of the five "water towers" of Kenya. Its montane forests are an important part of water-flow regulation, flood mitigation, water storage, groundwater recharge, water purification, micro-climate regulation, and reduced soil erosion and siltation. The forests also provide other major environmental services, including nutrient cycling and soil formation. In addition, their role in storing carbon makes the Mau Forest globally important for mitigating climate change.

The Mau Complex supports key economic sectors in Kenya including energy, tourism, agriculture, and water supplies for settlements. The catchment's potential

hydropower generation capacity is approximately 535 megawatts, which represents 57 per cent of Kenya's current total electricity generation. To date, projects that have already been developed, are under construction, or are proposed within the Mau catchment will generate only about 190 MW (GoK and UNEP 2008).

The Mau Complex forms the upper catchments of all (but one) main rivers west of the Rift Valley, including:

- Nzoia river - (Lake Victoria)
- Yala River - (Lake Victoria)
- Nyando River - (Lake Victoria)
- Sonde River - (Lake Victoria)
- Mara River - (Lake Victoria)
- Kerio River - (Lake Turkana)
- Molo River - (Lake Baringo)
- Ewaso Nyiro River - (Lake Natron)
- Njoro River - (Lake Nakuru)
- Nderit River - (Lake Nakuru)
- Makalia River - (Lake Nakuru)
- Naishi River - (Lake Nakuru)

It feeds major lake, including

- Lake Victoria
- Lake Turkana
- Lake Baringo
- Lake Nakuru
- Lake Natron

Of which three are Transboundary

- Lake Victoria (Nile Basin)
- Lake Turkana (Kenya/Ethiopia)
- Lake Natron (Tanzania/Kenya)

of annotation guidelines are given in the appendix of this document. An ArcMap .style file is available from GRID-Sioux Falls which provides standard symbology for many common map layers.

Anyone experienced with using ArcMap should have no trouble creating maps that approximate designs used in past atlases by following an example map and the guidelines for fonts, and symbology given in the annotation guidelines in the appendix. Multiple examples will probably be needed to cover different types of maps. If a different design is to be followed it is still very useful to create a model or example to guide

map creation. In either case ArcMap can save preferred symbology settings in an ESRI Style Set File (.style).

Be aware that very light colours might not show during printing, so be sure to double-check with your printing company by requesting high-resolution proofs to see if the colour comes through. Attention should also be paid to the font used on these maps. Throughout the publication, all maps should contain the same fonts and they must be clear. Also, very fine lines are difficult for presses to print and might appear broken or not show at all.

GROUND PHOTOS- SEARCH AND SELECTION

Ground photos

It takes a lot of time to find good, topically relevant photographs. There must be one person appointed specifically to finding relevant photographs and maintaining an inventory of them. As the Atlas compilation progresses, a more detailed search will be beneficial to finding images specific to the topics (a particular site story, country, environmental problems etc.). When different sizes or resolutions of a particular

photo are available, always pick the photo with the highest resolution and largest dimensions. The designer must carefully use the photographs in layout, based on the resolution of the photographs.

WEBSITES

There are a couple of websites with a plethora of photographs that can be used for ground photos:

1. The most useful website is Flickr.com.

You're forbidden to use Flickr images marked as **copyrighted** (or 'All rights reserved') unless you get explicit permission from the author, and obtaining permission from authors can be a lengthy process. Focus should be on using the non-copyright images that are found under what is called "Creative Commons" or "CC." Direct link for exploring these images is <http://www.flickr.com/creativecommons/> Under Creative Commons, each image is available under one of six customised licenses built to influence where and how each image can be used. More information on Creative Commons License can be found at Flickr: [Creative Commons page](#). From there, you can enter search portals for each of the six CC licenses.

The screenshot shows the Flickr Creative Commons page. At the top, it says "Many Flickr users have chosen to offer their work under a Creative Commons license, and you can browse or search through content under each type of license." Below this, it lists "Here are some recently added bits and pieces:" followed by a grid of image thumbnails with their respective licenses. The licenses shown are: Attribution License (BY), Attribution-NoDerivs License (BY-ND), Attribution-NonCommercial-NoDerivs License (BY-NC-ND), and Attribution-NonCommercial License (BY-NC). Each license is accompanied by a brief explanation of what it means. For example, Attribution means "You let others copy, distribute, display, and perform your copyrighted work - and derivative works based upon it - but only if they give you credit." Attribution-NoDerivs means "You let others copy, distribute, display, and perform your work - and derivative works based upon it - but for noncommercial purposes only." Attribution-NonCommercial-NoDerivs means "You allow others to distribute derivative works only under a license identical to the license that governs your work." Attribution-NonCommercial means "You allow others to copy, distribute, display, and perform your work - and derivative works based upon it - but only if they give you credit." The page also includes a search bar and a link to "Add a Creative Commons license to your photostream."

IMPORTANT TIPS:

- Look for non-copyrighted images or seek adequate permissions from the photographer for using them.
- Always save/acquire the best quality of the image i.e. high resolution/ original photograph (300 DPI is the standard for high resolution photos). Photos and maps should be colourful and crisp with no blurring. They should also be relevant to the topic being discussed and be made as large as possible, often bleeding off the pages.
- Keep records of photo details such as original name, photographer and source link when saving them. You may need them later. Keeping an Excel spreadsheet is a good way of keeping track of the information.
- Remember, it can take months to obtain an image if contacting the photographer for permissions and original imagery. The e-mail request sent to the photographer must include a request asking for permission to use, alter the image because it is likely that the designer will have to resize, crop, brighten or fade the photo as required for the publication design.
- And most importantly, give appropriate photo credit.

Below are the instructions to go to the non-copyrighted images from Flickr.com.

1. Click on the Empty Search Field.



2. Click on Empty Advanced Search Field.



3. On the bottom of the following page, check all three boxes for creative commons and type in the related word for the photo and click Search.



Attention must be paid to the photo credit. See below on the appropriate way of giving credit to the photographers. It actually depends on what license category the photo falls under. Skelliewag.org has some other useful tips as given below

BY: Attribution License

The images used at Skelliewag.org all come under this particular license. It allows you to modify the images (by cropping them, or writing on them, for example) and to use them in both commercial and non-commercial spaces. The only requirement is that you credit the author with a link back to their profile.

BY: = Attribution-NoDerivs License

This license allows you to use the photo freely in any context as long as you credit the photographer. It's more restricted than a simple Attribution license because

you're forbidden to modify the work in any way (that includes cropping and writing on the image).

BY: \$ = Attribution-NonCommercial-NoDerivs License

This license allows you to use photos in with a credit as long as they're not modified and as long as you're not profiting from the context of the image. Examples of such contexts would be: blogs displaying ads, inside products, online stores. In other words, anywhere it could be argued that the image helped increase your income.

If you're not monetising the space at the moment but want to leave your options open, it would be a good idea to stick with the more flexible licenses above.

BY: \$ Attribution-NonCommercial License

This license allows you to display and modify the image in any non-commercial space with a link to the photographer's profile. Once again, if you plan to profit from the space in future, you're better off sticking with the more flexible Attribution License.

BY: \$ CC Attribution-NonCommercial-ShareAlike License

This license allows you to use photos in non-commercial spaces with credit. There is one extra requirement, however: that you link to the license page with the image credit (alongside a link to the photographer's profile). Share Alike means that you need to make clear the license of the image wherever you use it.

BY: CC Attribution-ShareAlike License

This license allows you to modify the photo and display it in any context as long as you link to the photographer's profile and the distribution license for the photo. Here's a link to the Attribution-Share Alike 2.0 Generic License.

2. There are other sources like Yahoo photos, and Google images, Magazines and Online articles.

However, finding non-copyrighted images and seeking permissions for the copyrighted ones can be a challenge when using these sources.

REFERENCES

UNEP typically follows the GEO style sheet for text and numbering instructions and also for compiling the references. The GEO style sheet contains a section on general rules, references, numbers, preferred spelling. The following instructions on writing references (from GEO style sheet) have been very helpful.

- Use the Harvard system for references (Smith 1996)
- Where you wish to refer to several publications by the same author in the same year, distinguish them in temporal order (Smith 1996a, Smith 1996b)
- Where two authors have the same name, distinguish them by including their initial(s)
- Where references have multiple authors, include all the names in the first reference to the publication; thereafter use the form 'Smith and others, 1969'
- Never number your references (this gives rise to hideous renumbering problems every time you add or suppress a reference, unless you have an automatic system)
- Typical styles for a book and a journal reference (respectively) are as follows:

Ainsworth, M. D. (1996). *Journey across Africa*. Heinemann, London

Tinbergen, N. (1972). Functional ethology and the human sciences. *Proc. R. Soc.* B182, 385–7

- Where the reference is to a chapter in a book with a separate editor, use this style:

Ainsworth, A. (1969). Fighting malaria. In *Common Diseases of the 19th Century* (ed. B. Foss) vol. 4, pp. 114–5. Methuen, London

- Note that only the published title (title of a book or journal) takes italics
- Unpublished papers or personal communications are not published and therefore do not take italics
- Names of books should be given in full, using initial caps for the major words in the title; names of journals should be abbreviated only where there is an official abbreviation and this is known to you

DESIGN AND LAYOUT

Professional design software such as Adobe InDesign or Quark Express, Adobe Photoshop, Adobe Illustrator, and Adobe Acrobat Professional is recommended.

Based on working full-time with one designer, scheduled time for layout and design should be approximately one month for every 50 pages of the book.

Example: An approximate 150 page book should take about three months.

Printing will take around two months (including shipping) after the finished Atlas is sent. The preferred method used would be high-quality PDFs of the completed publication. The printer may have other means to receive the publication that is preferred over PDFs.

Guidelines

Atlas page size is 27.94 cm wide by 35.56 cm high.

British English will be used throughout the publication.

Units of measurement will follow the metric system.

Based on the UN's publications guidelines, commas used for 000's numbers shouldn't be used and instead replaced with a space.

Example: Over 1 000 km².... Population of 10 000...

Numbers in a paragraph that are under ten should be spelled out. All numbers starting a sentence should also be spelled out.

Text

Headings – bold, Sans Serif font; moderate spacing between headline and body text.

Body text – 10pt or 11pt Serif font; line spacing should not be crowded.

Captions – 8pt or 9pt Serif or Sans serif font.

Body text should be in two or three columns across the page and not crowd images.

Avoid shadowing body text if possible, especially smaller fonts, as it makes the text difficult to read. This applies to maps, photos and other graphics as well.

UNEP Criteria

The following criteria must be at the forefront of the publication. At least **two** of listed criteria need to be met. It is mandatory that in each publication the specific criterion is recorded.

- Chlorine-free paper;
- Recycled paper;
- Wood pulp from sustainably managed forests;
- Ink from renewable resource, e.g. vegetable, soy, linseed;
- Coatings should be water based; and
- The percentage of paper bleach must be minimal.

These statements are to be placed in the “Green Dot” (colour: Pantone 368 C) along with a disclaimer.

Example Disclaimer:

The views expressed in this publication are not necessarily those of the agencies cooperating in this project. The designations employed and the presentations do not imply the expression of any opinion whatsoever on the part of UNEP or cooperating agencies concerning the legal status of any country, territory, city, or area of its authorities, or the delineation of its frontiers or boundaries.

Mention of a commercial company or product in this report does not imply endorsement by the United Nations Environment Programme. The use of information from this publication concerning proprietary products for publicity or advertising is not permitted. Trademark names and symbols are used in an editorial fashion with no intention of infringement on trademark or copyright laws.

We regret any errors or omissions that may have been unwittingly made.

DISCLAIMER

The views expressed in this publication are not necessarily those of the agencies cooperating in this project. The designations employed and the presentations do not imply the expression of any opinion whatsoever on the part of UNEP or cooperating agencies concerning the legal status of any country, territory, city, or area of its authorities, or the delineation of its frontiers or boundaries.

Mention of a commercial company or product in this report does not imply endorsement by the United Nations Environment Programme. The use of information from this publication concerning proprietary products for publicity or advertising is not permitted. Trademark names and symbols are used in an editorial fashion with no intention of infringement on trademark or copyright laws.

We regret any errors or omissions that may have been unwittingly made.

UNEP promotes environmentally sound practices globally and in its own activities. This publication is printed on 100 per cent chlorine free paper from sustainably managed forests. Our distribution policy aims to reduce UNEP's carbon footprint.

Note for printer: Kindly note that the globe is on a black box (done in Photoshop) and placed on the large page. The black should be continuous, no line should separate the 'box' and the background page. Please make all the adjustments necessary to fit the specifications for the book (hard cover, spine width etc.). Please ensure that the photos do not become dull.



Cover size:

65.2 cm width by 44.6 cm height with 1.6 cm bleed off four edges

Background colour:

CMYK Black (C: 50%, M: 50%, Y: 50%, K: 100%)

Title Font:

Futura Medium, 48pt

Subtitle Font:

Futura Medium, 24pt

Back page text:

Futura Medium, 14pt

Kindly note that the globe is on a black box (created in Photoshop) and placed on the large page. The black should be continuous; no line should separate the 'box' and the background page. The globe can highlight a continent, region, or country.

Make all the adjustments necessary to fit the specifications for the book (hard cover, spine width etc.). Ensure that the photos do not become dull.

Printers must be contacted for quotes approximately 3 months before the Atlas is required to be delivered for its launch. Bid Annex must be prepared and it must contain the following specifications and thereafter sent to the printers for cost estimate. The Project Coordinator must follow up with the printers to communicate requirements and liaise with the printers for other unexpected questions and in case there are other unknown problems arising at any stage.

PRINTERS

It is not necessary to only explore the printing options locally. There are printers all around the globe that can meet the requirements, budget and deliver the best timely results. However, you must do some homework before you finalise on any of the printers. Ask for the printer's profile and their work samples. Ask for some references and check with them for their professionalism, timeliness service and quality of work. Just for your knowledge, UNEP has used the following printers for its publications.

1. ProgressPress
Strickland House, 341 St. Paul's Street, Valletta,
VLT 1211, Malta
Contact person: Mr. Joe Bonnici
E-mail: jbonnici@progresspress.com.mt
Office phone 356-255-94230

2. ColorCraft Limited
Kodak House, Phase II Unit 8-9, 16-F
321 Java Road, North Point, Hong Kong
Tel: 852 2590 9033
E-mail: enquiries@colordraft.com.hk

DATA SHARING

It is advisable to share the content with the printer electronically. An FTP site serves this purpose very well. Format of the documents should be discussed with the

printer in the beginning. PDF documents are usually acceptable, but the InDesign format is also useful in case the printer wishes to do some minor corrections on its own.

ONSITE PROOF CHECKING

Onsite proof checking will certainly lead to a better quality product. The production team must ensure that they deliver the most final copy with no errors to the printer. One of the production team members must visit the printer and check the proof. This individual must take along entire data of the book including all maps, images, etc. Some errors can be fixed right away at the press if files are available. You will be surprised at the number of issues caught at this stage. Note that the printer will charge for the fixing the errors if caught at a later stage of the printing. This must be thought over when allocating funds for this activity.

LAUNCH

Officially launching the Atlas is an important event for visibility. If time and budget allows, one could produce a Google video for the Atlas (check na.unep.net for videos of previous Atlases), create PowerPoint Presentations suited for the launch audience, design posters or CD's with PDFs of the entire Atlas in low resolution, and other promotional material like mugs, pens, mousepads, etc. for distribution. The Project Manager must take the responsibility of sending e-mails about the launch along with the PowerPoint through various list servers and distribute this information through other social media like Facebook and Twitter.

Look for venues, conferences, meetings where you can promote your Atlas. Check with conference contributors to include Atlas CD's in their welcome package, exhibit at the conference and distribute promotional material to the attendees. This activity will be contingent on the availability of resources (funds, time and people).

BID ANNEX

Contact person's details from your team: Name, Phone no, E-mail

Return bid due: ASAP (better to obtain quotes at the earliest)

Specifications:

Language: language in which the book will be printed

Finished size: 11x14 inches - portrait (27.94 x 35.56 cm) (Size of Africa Atlas, One Planet Many People and Kenya Atlas)

Copies: Number of copies required

Pages: Give an estimate of the total number of pages of the book to be printed

Binding: Hard cover, case bound, left side (book format) (As used in UNEP's Atlas)

Cover: Laminated (varnished) Hard Bound Cover; spot varnish for small graphic element
4 colour process + aqueous coating (5 colour) and 4-side bleed
(Specify details of the icons, objects to be printed on the cover e.g. globe approx 2 inches)

Glossy cover is more durable

Specify if you need cover sleeves and its related details.

Dust Cover: none

Inside paper: 70 lb./104 gms text or 80 lb./118 gms text (per recommendation), gloss art recycled, chlorine-free, and/or environmentally friendly paper (Chlorine-free paper; Recycled paper; Wood pulp from sustainably managed forests; Ink from renewable resource, e.g. vegetable, soy, linseed; Coatings should be water based; and the percentage of paper bleach must be minimal)

These statements are to be placed in the "Green Dot" (colour: Pantone 368 C) along with a disclaimer.

Inside printing: 4 colour process, 4 side bleed

Media: Specify how you will be sharing the content with the printer.

1st choice – press quality pdf

2nd choice - InDesign files

Delivered by ftp download and/or DVDs shipped to printer

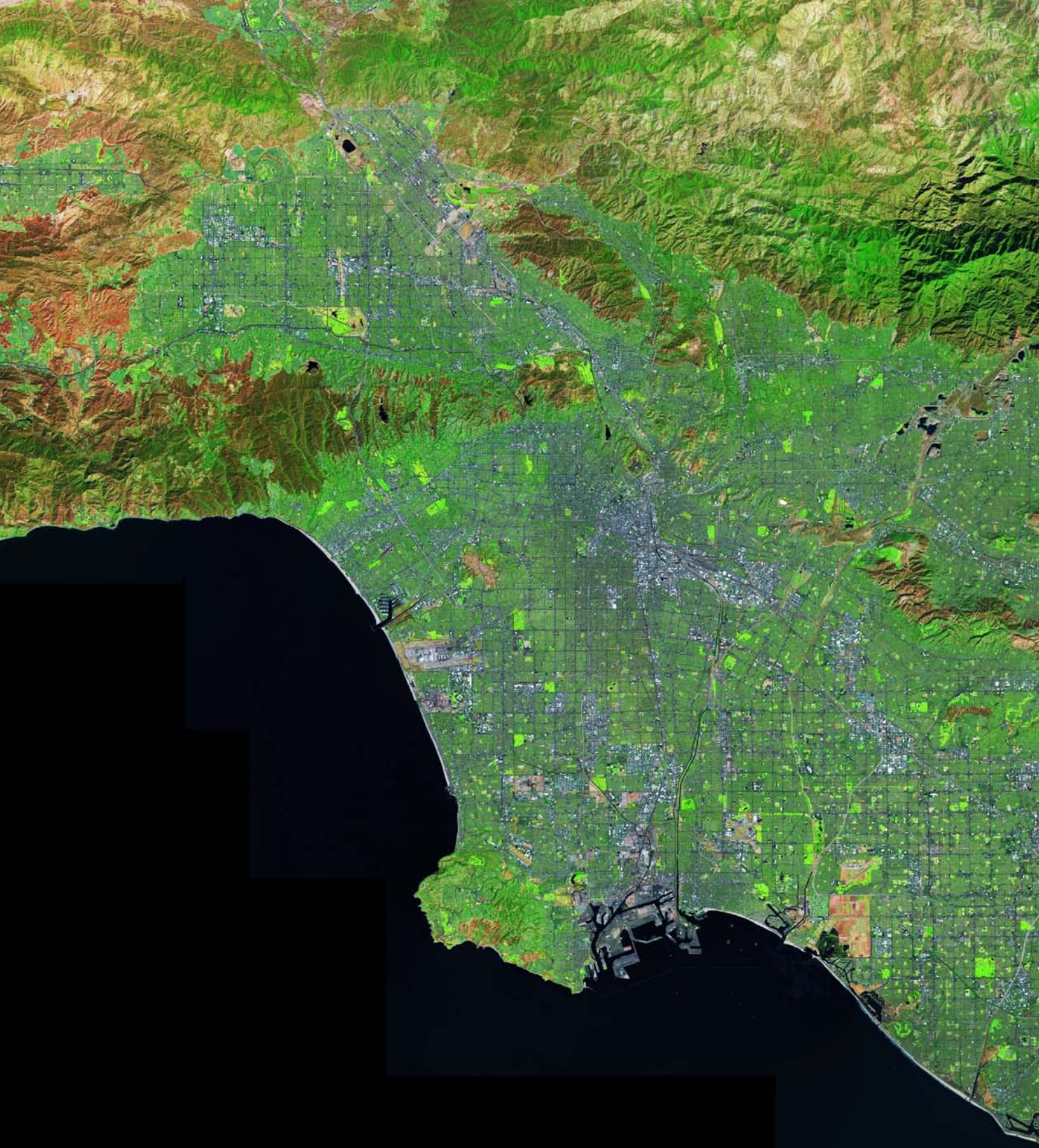
Delivered to Printer: Specify date when you would deliver all the content to the printer

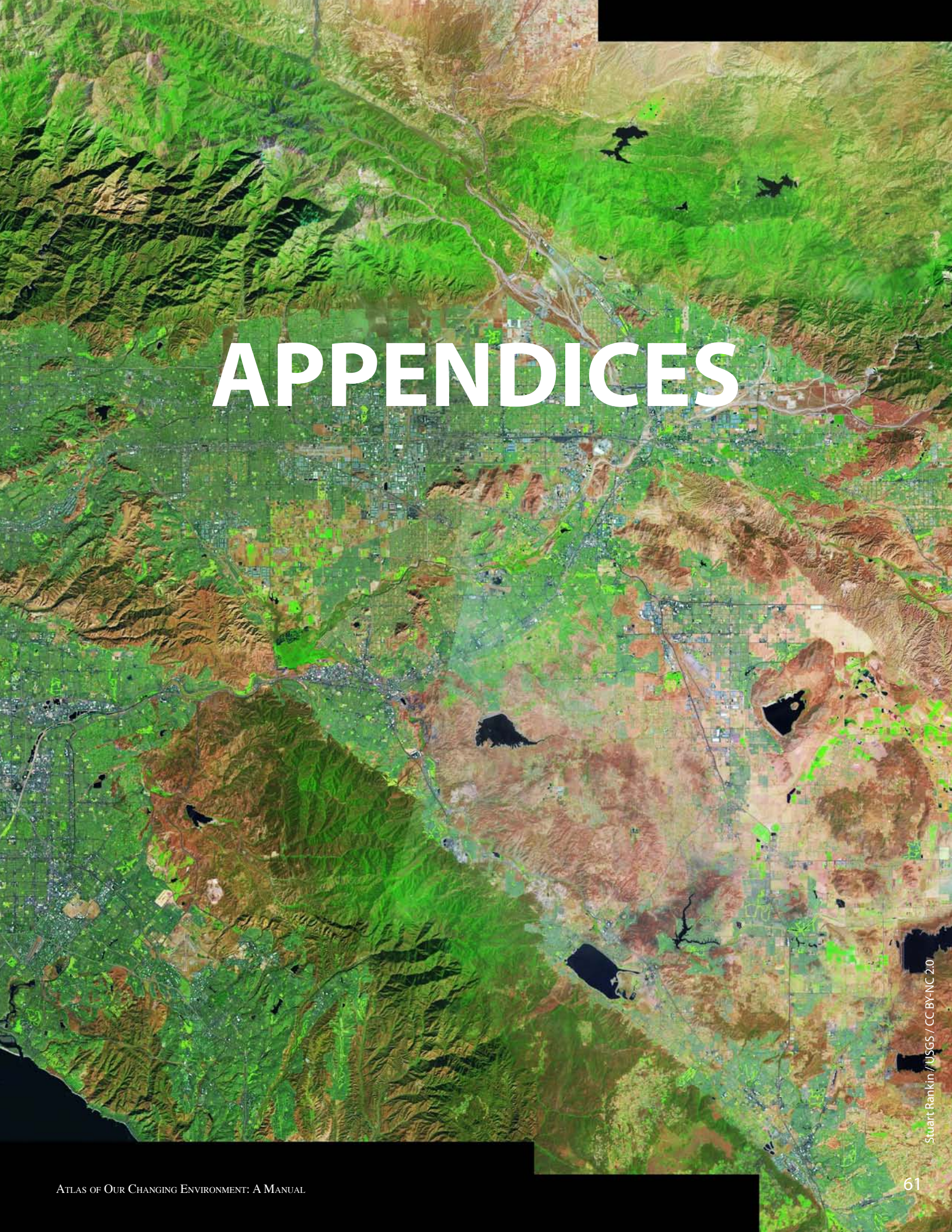
Proofs: Specify date and if you need to have the paper proofs delivered to your office, if yes, also specify the address of the location where you wish to receive them.

Press Check: (Note- Always Advisable). Time permitting – on-site press check, if funds available, request for high resolution proofs

Freight costs: Ask for the charges that will be incurred to ship the books to the specified location e.g. Include shipping costs to: SMI Books, PO Box 119, Gunnel's Wood Road, Stevenage, Hertfordshire SG1 2BH, UK

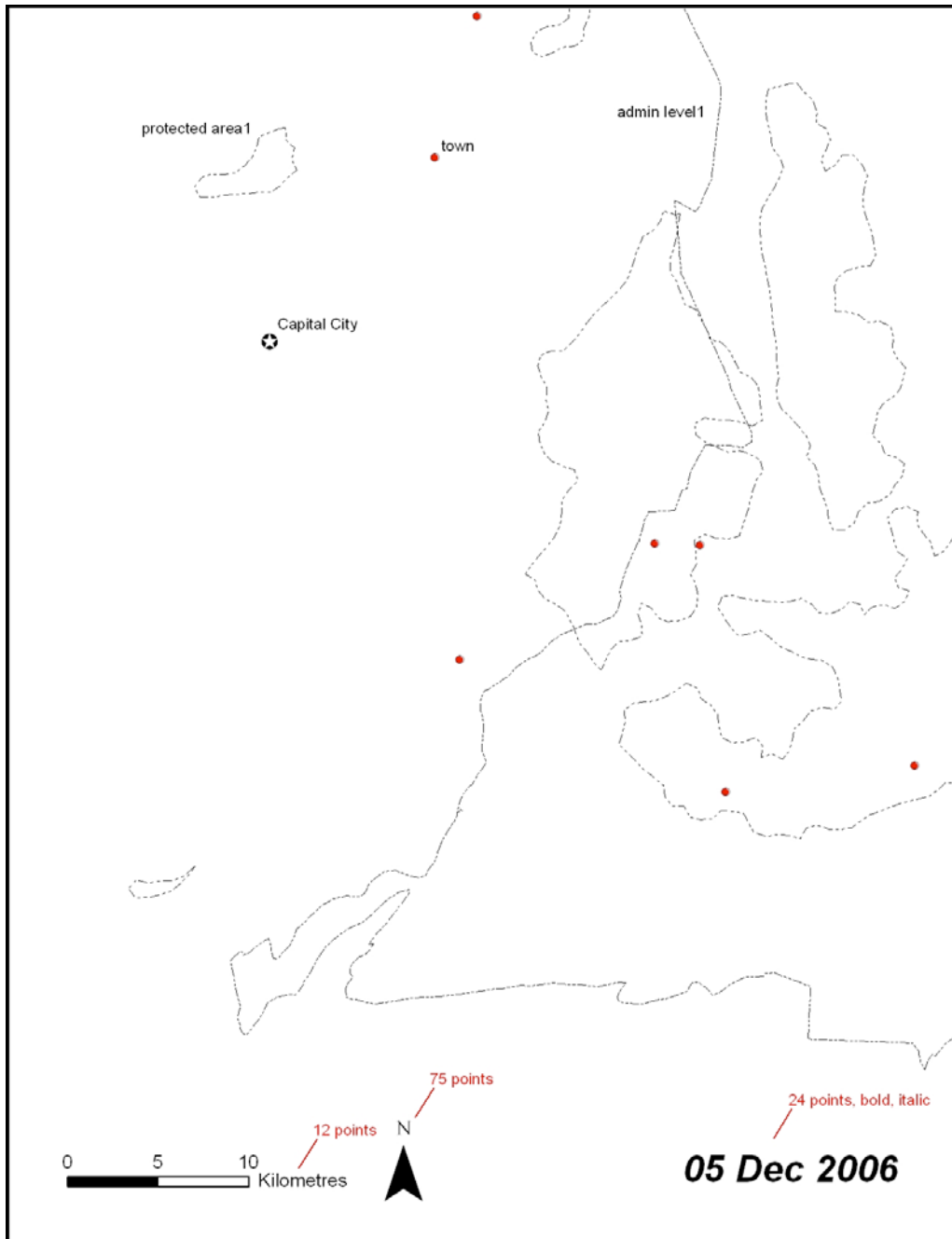
Deadline: Specify the date and location e.g. Physical copies absolutely must be available June 10th, 2008 in Cape Town, South Africa for scheduled release at African Ministerial Conference on the Environment



An aerial photograph of a mountainous region. The terrain is a mix of green, brown, and tan, indicating different vegetation and land use. A river flows through the center of the image. A city is visible in the lower-left quadrant. The word "APPENDICES" is overlaid in large white letters.

APPENDICES

Appendix A: Atlas of Our Changing Environment – Illustrator Style Guide



Illustrator dimensions:

Width: 11.5 inches

Height: 12.5 inches

Symbology guidelines – ArcGIS map layer

Use the **Atlas_Illustrators.style** file to symbolise most features and borders (see example below). For features or borders not covered refer to previously published illustrators and strive for stylistic consistency as possible.

Appendix B: Annotation Standards:

Country Names:

All capital letters
19 pt Arial regular
100 per cent horizontal scale
Tracking as needed between 100 and 2000 percent
Leading 21.6 pt
Black with white drop shadow
Some instances of vertical or diagonal orientation –
avoid where possible

Province/District Names (when no country name is used):

19 pt Arial regular
100 per cent horizontal scale
Tracking as needed between 100 and 2000 percent
Leading 21.6 pt
Black with white drop shadow

City Names:

11-14 pt Universe 57 Condensed
0 tracking
100 per cent horizontal scale
Black with white drop shadow
12 pt leading when needed

Island:

14 pt Trebuchet MS regular

Lakes:

14 pt Times New Roman bold italic (larger or smaller as
appropriate to site)
Light blue
Centered spacing

Rivers:

11 - 14 Times New Roman bold italic
Black with white drop shadow
Tracking as needed
Horizontal scale as needed

Oceans:

18 pt Times New Roman bold Italic
Light blue
All caps

Gulf/Bay/etc:

16 pt Times New Roman bold italic (larger or smaller as
appropriate to site)
Light blue
200 tracking
19.2 leading

Protected Areas, National Parks, etc.:

Myriad Pro italic
Font size dependant on importance of area to the site
story
Tracking generally 150 and up depending on fit to the
area being labeled
Drop shadow as needed for visibility

This publication provides a step-by-step guide for analysing and packaging time-series satellite imagery for communicating visual environmental changes on the ground to a wide variety of audiences. The manual is based on lessons learned by UNEP in developing the Atlas of Our Changing Environment publication series. The success of the Atlases 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. This manual will be especially useful to practitioners in learning how to effectively package satellite images from different time periods to accurately reflect significant changes on the ground. It would also be useful for any UNEP-supported publication produced for inclusion in the series of Atlases to use these design standards and style guidelines.

