Vision: The world's key decision-makers consistently and routinely take into account the full value of nature and the consequences of their activities on natural systems, thereby resulting in greater conservation of natural systems, and averting economic and social disruptions due to the misuse of "natural capital".

The Earth Genome will deliver this vision by creating the first platform to enable easy-to-use, inexpensive, scientifically credible, continuously updated global information on natural resources, coupled with powerful and relevant decision-support tools. The platform and tools will exponentially lower the cost and time to analyze data and translate it into insights that decision-makers can use.

Progress to Date

Since the launch of the Earth Genome in March 2014, we have made rapid progress. To pilot the platform, our focus has been on development of breakthrough decision-support tools designed to meet the needs of global businesses. In just one year we are now fully underway in developing an initial tool and doing this in a way that connects world-class partners across an array of sectors: global business, academia/science, technology, data management, and geospatial visualization. The following narrative provides a summary of our gains over the last year in:

- Development of the **initial tool**, and expressed desire for additional tools
- Recruitment of world-class **science team** at Arizona State University
- Engagement of **technology partners** to build-out tools and prototype the platform
- Creation of a non-profit entity and building the **organization**

Initial Tools. In 2014 we developed a close partnership with seven leading global corporations, under the auspices of the WBCSD, to co-create an initial tool focused on revealing options for decisions on water use — the Green Infrastructure Support Tool (GIST). GIST will build off existing water risk assessment tools by revealing nature-based solutions to mitigate water quantity and quality risks. Opportunities will be evaluated on a true ROI (return on investment) basis, across water improvement, economics/financial, and environmental/social impact. Given extensive engagement with these global companies over the past several months, including an all-day workshop hosted by CH2M Hill at their global headquarters in Denver, we have aligned on exciting design specifications for the tool (see *Appendix A*). The companies are keenly excited about the potential of the tool, and are committed to piloting it later this year. The tool will then be showcased at the WBCSD Paris Council meeting in December 2015.

During the design of this initial tool, we received extensive expressed interest from major corporations on other high-impact tools all focused on water and the broader energy/food/water nexus. This includes the creation of an agricultural supply chain tool focused on optimizing crop suitability and mitigating food sourcing risks. And we are in on-going discussions with BlackRock and Goldman Sachs to design a tool for guiding decision-making on sustainable investments, based on water quantity/quality insights.

Science. Design of decision-support tools requires high-quality science, for aggregating and curating existing data sets, developing new data sets, and creating algorithms and analytics. We conducted due diligence to find an academically rigorous but also pragmatic institution, seeking input from a number of advisors in the field. From this effort we selected a team from the Center for Biodiversity Outcomes at Arizona State University. The team is led by Dr. Leah Gerber and we have engaged water expert/ecologist Dr. John Sabo and several others at ASU to lead the WBCSD water tool development.

Platform and Technology. Our long-term goal is to create a platform that integrates data from all relevant sources and translates that data into breakthrough information, insight, and tools for decision-makers. The platform will also serve as a hub for connecting people and organizations (not just data and technology), fostering communication across all relevant actors: data providers, scientists, technology experts, tool and app designers, and decision-makers. This platform will ensure that data on our planet is turned into useful insight for high-value decisions that are made "better, faster, cheaper" than ever before (see *Appendix B*).

To build this platform we have formed a close partnership with Esri, the global leader in geospatial software and GIS earth datasets. Through a Memorandum of Understanding (MOU) with Esri, we have access to their extensive existing data, and use of their widely adopted (by corporations and governments) ArcGIS technology. The partnership with Esri greatly enables us to move forward with significantly less risk on the platform, while still maintaining the ability to build in wide access to data and tools. We have also hired Blue Raster, a leader in visualization, to write the initial software code for our first tools.

Organization. In March 2015 we incorporated as a California non-profit organization, and are awaiting IRS qualification as a tax exempt 501(c)(3) charity. A team from the law firm Morrison & Foerster is providing all our legal needs on a pro bono basis.

We also received an extraordinarily generous contribution of $1 million from the William K. Bowes Jr. Foundation, and we are pursuing other grants towards our goal of raising $2 million by the end of 2015.

We continue to widen our circle of partners and collaborators. In addition to the entities already mentioned, we have a MOU with the World Resources Institute (WRI), an ongoing engagement with the Environmental Defense Fund (EDF), and maintain regular contact with numerous other sustainability entities.

We know the long-term success of the Earth Genome is dependent on a self-sustaining revenue model. We believe the platform, and the tools it provides, will be in great demand. We are discussing with advisors the potential revenue models focused on professional services, data/app usage fees, and membership.

Looking Ahead

By end of 2015 we will have successfully:

- Piloted the first Earth Genome **decision tool**, with demonstrable impact on decisions by end users
- Prototyped the **platform and needed API's** (Application Programing Interfaces) for interoperability
- Integrated the first **essential datasets** into the Earth Genome platform, linked to specific tools
- Designed an "**application pathway**" (technology roadmap) for development of additional tools over the next 2-3 years, based on direct input from corporate and investor end users
- Expanded our **partnership with Arizona State University**
- Built-out a **high performing Earth Genome team**
- Tested concepts for a realistic **revenue model** beginning in 2016

Appendix A

theEARTH GENOME
REVEALING THE POSSIBLE

GIST: Potential Functionality

Initial Specification

wbcsd

ARCADIS · CH2MHILL · DOW · KERING · MONSANTO · PEPSICO · VEOLIA

Operations and Status Quo

- **Screen 1: Company operations**. Map company facilities globally. Rank on projected operations and water demand
- **Screen 2: Existing infrastructure.** Overlay of existing gray infrastructure being used to address water issues. Add green infrastructure data as available

Risks and Opportunities

- **Screen 3: Water risks**. Overlay water quantity/scarcity risks over existing operations.
- **Screen 4: Land-use Land-cover**. Visualize and rank polygons (e.g. degraded areas) versus company operations. Define portfolio of LULC "reversals" to identify prioritized green solutions*
- **Screen 5: Scenario map**. Create map of potential future state based on green infrastructure solutions

ROI: Benefits and Impacts

- **Screen 6: Water ROI**. Estimate return on storage and recovery, based on simulated LULC change from human (gray) to nature (green), considering near term climate scenarios and measuring the impact on storage to shallow aquifers for potential recovery. Graph showing ROI as function of area restored.
- **Screen 7: Economic ROI**. Estimate annual return (ROI, IRR, NPV) in terms of cost reductions in acquisition, conveyance, filtration, treatment, insurance costs, etc based on "reversals" proximity to site operations
- **Screen 8: Enviro/Social ROI**. Visualize projects against biodiversity and potential co-benefits. Estimate green solution impact for human societal benefit. Externalities for both green and gray

This tool will allow companies to visualize a portfolio of potential green infrastructure in a geospatial context, estimate water ROI of these projects and monetize economic/environmental ROI

* Potential options for the portfolio: wetland restoration, aquifer recharge, floodplain restoration, reforestation, agricultural soil management, coastal storm protection (estuaries), and fire management

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Appendix B

theEARTH GENOME
REVEALING THE POSSIBLE

The Platform: Visual Representation

Preliminary

Governments · Multi-Laterals · NGO's · Corporations · Investors · Consumers

The EARTH GENOME PLATFORM

User Interface

Earth Genome: Directory/ Map
(Curated = Interconnections, Interoperability)

Authentication

Transaction Interface
(Subscription/Revenue)

Search/ Query Function

esri
(Skin on Esri ArcGIS)

Resources

Resources: Developers
(Developer tools and APIs)

Resources: Non-developers
(Tools for non-GIS experts, e.g. Story Maps)

Scientific modeling
(Curated = Scientific findings and alternative approaches)

Data and Apps

Microsoft Azure
(Cloud storage & computation)

Processed Data
(App and web "ready", standardized resolution, interoperable)

Custom Apps

Data repository · App interface

Data/Tool Linkages

Distributed Data and Apps
(Not directly on Earth Genome platform)

Other Data: Raw Data/ Imagery · Private Datasets · Public Datasets

Other Tools: (e.g. story maps) · (e.g. WRI Aqueduct)

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