

Global Paleofire Working Group phase 2 (GPWG2)



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Understanding the role of human-climate-fire linkages in the past and their influence on the biosphere is key in light of the major fire-regime changes that are occurring on most continents. In the past decade, the GPWG analyzed fire history using the Global Charcoal Database (GCD), and advanced our understanding of the controls and impacts of fire on a wide range of spatial and temporal scales (Marlon et al. 2016). Climate variability had a strong, persistent influence on Late Quaternary trends in fire through its direct impacts on the number and timing of ignitions and fire weather, and through its indirect impacts on vegetation changes and productivity. The complexities of vegetation change and its influences on fire, especially at regional scales and on multi-decadal to centennial timescales, however, remain poorly understood, as do the varied roles of humans (Vanni re et al. 2016). The GPWG is therefore launching a new phase - GPWG2 - to more deeply examine the linkages between fires, climate-driven fuel changes, traditional human land uses, modern landscape management, and biodiversity conservation.

GPWG2 will involve fire modelers and stakeholders through projects and workshops, where we will jointly identify questions and approaches that prioritize science in support of sustainability, to provide evidence-based solutions to understanding and managing fire under rapidly changing global conditions. GPWG2 also includes a new focus on crowd-sourced data collection, which is being led by early-career researchers. Throughout Phase 2, we will continue to develop and promote the use of open-source tools, hypothesis testing, and "natural" and model experiments.

Organization and strategy

Three focus groups will address (A) similarities and differences in fire baselines at the biome level; (B) fire risk assessment and management practices to support planning at regional and finer scales; and (C) the role of fire in biodiversity conservation (Fig. 1). These groups will drive our workshop agendas over the next years, and will draw on and intersect with four cross-cutting initiatives. The initiatives, in turn, will provide the data, tools, and infrastructure to support the research of the focus groups. Specifically, the cross-cutting initiatives are:

- Geographic data development for Asia and Africa, particularly to support fire and risk management, which are critical for human livelihoods and the future sustainability of ecosystem services there;
- Syntheses and database development, including the launch of a new user-friendly website and database architecture to support paleofire science broadly (www.paleofire.org);
- Paleofire data-model integration and links with other databases associated with LandCover6k, the European pollen database, Neotoma, LaACER, and more, to support data-model integration and multiproxy comparisons of fire from ice cores, for example;
- Develop the modern Global Charcoal Database (mGCD), launched during the last GPWG workshop (Harvard Forest, October 2015), and containing surface samples obtained using a standardized protocol, to improve calibration of fire history records

and data-model comparisons. This effort will also facilitate the quantification of past changes in fire activity and quantification of uncertainties in reconstructions.

Key components of GPWG2 as a whole, then, are fostering connections among individuals within the interdisciplinary community; promoting strong data practices, including development, access, management, and sharing, among the community; and facilitating the integration of teams, data, and tools to address the questions in fire science at a broad range of temporal and spatial scales. Importantly, GPWG2 is also committed to building capacity in developing countries and to promoting education and training of students and early-career researchers.

Further details on the organization of the working group, coordinators and key participants, and future activities can be found on the GPWG website: www.gpwg.paleofire.org

Upcoming activities

The first workshop on "Fire history baselines by biome" will be near Bordeaux, France, 25-29 September 2016: www.gpwg.paleofire.org/fire-history-baselines-by-biome/ and there will be a follow up workshop on "Central European paleofire research" 5-8 December 2016: www.gpwg.paleofire.org/natural-and-human-driven-fire-regime-and-early-land-cover-changes-in-central-and-eastern-europe/. In 2017 and 2018 workshops are planned in Montr al (Canada), Bern (Switzerland), Eastern Africa and China.

A special issue of Quaternary international about "The fire-human-climate-vegetation nexus" is planned for winter 2016-2017.

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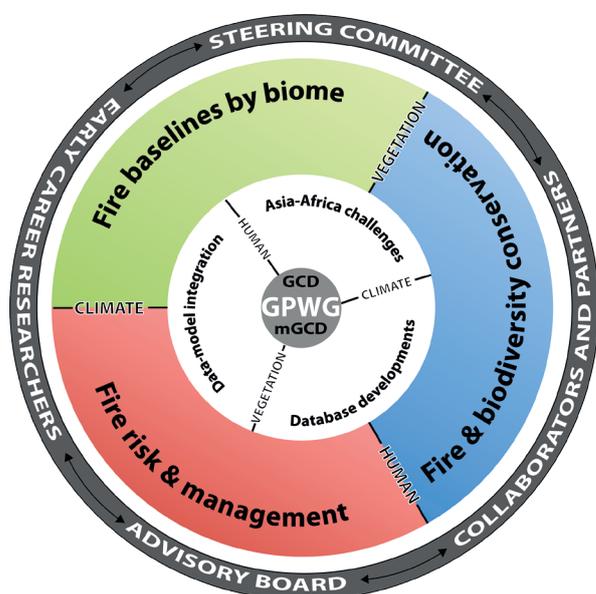


Figure 1: Structure of the Global Paleofire Working Group phase 2 activities.