**Spatiotemporal patterns of fire in the Netherlands**

Fire currently is not a major ecosystem process or hazardous concern in the temperate climate of the Netherlands. Humans have a large control on fire occurrence in these regions, indirectly by creating fragmented landscapes that limit fire spread, and directly by igniting and extinguishing fires. Climate is also important since it may induce the susceptibility of fuels to ignite and burn, and influences lightning ignitions. With a changing climate, fire may become more prevalent in these regions. It is therefore important to understand current spatiotemporal patterns of fire. The Suomi National Polar-Orbiting Partnership (Suomi NPP) spacecraft with the Visible Infrared Imaging Radiometer Suite (VIIRS) has been detecting fires around the globe with the help of a developed fire detection algorithm (Schroeder *et al.*, 2014). This thesis will investigate this dataset in combination with land cover, climate and infrastructure datasets to reconstruct the regional effect of the fires.

# Introduction

The mean global temperature has been rising and climate models simulations have illustrated that this is going to continue the following decade (Jacob *et al.*, 2014). Some climate zones are going to changing, whereby the amount of precipitation, temperature and extreme weather effects are affected and going to affect vegetation, water availability and more. The yearly global mean temperature is determining how fast or slow the climate is going to change (Beck *et al.*, 2018).

Wildfire are also going to be influenced by the change in climate. It will probably cause that burning seasons are going to be longer and the amount of fires are going to increase (Flannigan *et al.*, 2009). However, the global trend in yearly burned area and size is declining, which is driven by the more capital-intensive agricultural land use on the lands, socioeconomic development, and the growing demand of regional and global agricultural products (Andela *et al.*, 2017). The damage of wildfires mostly effects the production of timber damage on structures and short term suppression, but the long term effects of it are influencing wildfire habitat, water quality soil erosion and cultural or archaeological sites (Morton *et al.*, 2003). Furthermore, it is possible that it causes political destabilization, because the megafires (fires with a burned area > 500 ha) in Mediterranean area are seen as a major threat to these communities (San-Miguel-Ayanz, Moreno and Camia, 2013).

**MEER INFORMATIE OVER HET VERANDERDE KLIMAAT IN NEDERLAND**

The Netherlands is one of the countries that is going to be influenced by the increasing risk of forest fires if the predicted scenario of A1B (climate scenario whereby the energy resources are mixed, but technological development is fast (Nakicenovic *et al.*, 2000)) is going to be true (Lung *et al.*, 2013)

Another unique trait of the Netherlands is the spatial pattern of urban and agricultural land-use zoning. This landscape was caused by developments that were going on in second half of the 20th century. A national policy document was introduced about the on spatial planning. First was the spatial planning in the 1960s focused on spreading of regional grow poles, building housing for the growing population post-war and introducing the mobility caused by the generalization of the car. However, the changing social dynamic and the limit the urban sprawl toward peripheral area. In the 1970’s, the focus was on regional grow poles and zoning of land use was introduced. There were also buffer zones introduced to lower the urbanisation rate. In the late 1980’s, the subsidization of regional grow poles became financial unhealthy and therefore stopped. This subsidization was refocused on the cities and therefore focused on grow poles on a national level.

The final period of the national document of spatial policy reorganized spatial planning on local and regional governmental instruments such as municipalities. This caused that spatial planning became project driven instead of plan driven. However, this governmental instrument was overoptimistic and caused over zoning of areas, which lead to a more fragmented landscape. In 2010, the spatial planning became fully regional and local, which ended the national policy of spatial planning (Janssen-Jansen, 2016).

Furthermore, the Netherlands has implemented Bird and Habitats directive into its spatial policy as part of the European Union policy. Therefore, the national government is responsible for the management of these sites. It created several special designated chosen natural areas (Beunen, Van Assche and Duineveld, 2013). This policy also contributed to the fragmented landscape of the Netherlands.

**MISSCHIEN NOG OVER DE URBANISATIE EN RUIMTE OVER NEDERLAND BESPREKEN**

The paper is first going to summarize the datasets and the provide how these datasets are used in the analysis. The results sections are going to give an interpretation of the datasets and the validation of these results. At least, there is going to be a discussion if these results give valid information about the temporal spatial patterns in the Netherlands (**MOET UITGEBREIDER EN SPECIFIEKER)**

***BESPREKEN VAN WELKE SATELLIETEN EN DATASETTEN ER ZIJN OVER LOCATIES VAN BOSBRANDEN (BIJ METHODE NEERZETTEN, OMDAT HOE DE BRANDEN WORDEN GEIDENTIFICEERD EN MET WLEKE DATASET)***

*The Visible Infrared Imaging Radiometer Suite (VIIRS) attached to the Suomi National Polar-Orbiting Partnership (Suomi NPP) spacecraft and the Moderate Resolution Imaging Spectroradiometer (MODIS) have both contributed to the identification of active daily forest fires with the a fire identification algorithm. The MODIS had already multiple collections of fire datasets and is now on the 6th version of the data collection, while the VIIRS data set is more recently (Schroeder et al., 2014; Giglio, Schroeder and Justice, 2016).* ***MEER INFORMATIE OVER THE RESOLUTIE EN WAAROM VOOR DEZE SATELLIETEN GEKOZEN ZIJN***

***UITLEGGEN OVER NEDERLAND EN WAAROM HET ONDERZOEK OVER BOSBRANDEN IN NEDERLAND PLAATSVIND IPV EEN ANDER LAND***

*These datasets are going to use in the Netherlands. It has fragmented landscape (****BRON ZOEKEN****), which cause that fire spread is limited in these areas. However, the increasing temperatures can lead to that the climate is going to change in these areas. This causes that fire are going to be more prevalent in these areas. The analysis over the last decade can provide good information about where these fires starts, how these fires spread and how these fires influences It surroundings (****BRONNEN ZOEKEN DIE DIT AL EERDER HEEFT GEDAAN****). This research Is meant to show spatial temporal patters of fires near (****IDENTIFICATIE VAN HET GEBIED****).*

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