

4.3 Fire Affected Area Exported to GIS

The FAAGIS is a vector based GIS designed to manage the FAA data. A vector is defined as

a vector is a finite straight line defined by its end points (Worboys, 1995: 16).

Vectors are used to represent two types of spatial data; lines and polygons. A line is a single or number of connected vectors, a polygon (area) is a number of vectors where the start point and the end point share the same coordinates.

The FAA data were imported into the FAAGIS in ERMMapper vector format via an in-house Avenue script. During importation the FAA data were converted to Arcview polygons. Each polygon was attributed with the information described in Table 4.2.

Table 4.2 Description of FAAGIS Attributes

Attribute	Description of Attribute
FAA_id	A unique identifier constructed from the receiving station, satellite number, orbit number and a chronologically ordered number that indicates the number of objects for each pass (1..n).
Date	Date of the pass from which the FAA was mapped. The date is shown as year (4 digits), month (2 digits) and day (2 digits) – 19990401.
Month	Month of the pass from which the FAA was mapped. The month value is shown as year (4 digits) underscore month (3 letters).
Sat_ID	The NOAA satellites the FAA was mapped from, 12 or 15.
Orbit	The orbit number of the pass from which the FAA were mapped.
Data_Src	The receiving station from which the pass was retrieved, PER (Perth), MEL (Melbourne) or DAR (Darwin).
FAA_dgsq	The area of each polygon measured in squared degrees
FAA_kmsq	The area of each polygon in square kilometres
FAA_Pmtr	The perimeter of each polygon in degrees.
IBRA_id	A unique identifier for each polygon in the IBRA dataset (1...786).
IBRA80ID	The class number of the IBRA region (1..80).
IBRA80NAME	The name of the IBRA region (1..80).
REG	The abbreviation of the IBRA region (1..80).
IPR11	The IGAER (1..11).
State Name	The Australian state or territory.
IBRA80kmsq	The area (km ²) of each IBRA region (80 classes).

The date, orbit number, Sat_ID and Data_src information were added by the user as the FAA was imported into the FAAGIS.

The month field was calculated from the date field. This field is important for sorting the data into monthly bins both within the FAAGIS and the database. Sorting the data into monthly bins allows for summation of area by month.

The IBRA information is added to the FAA data when it is intersected with the IBRA digital map. The attributes of the IBRA and IGAER the FAA falls completely within are assigned to that polygon. When a FAA polygon falls on the border of two or more IBRAs the polygon is split in line with the IBRA borders and each new polygon is assigned the attributes of the IBRA it falls within. The state information is linked to the IBRA information as the IBRA are split on state borders. To split polygons on borders means that the polygon is divided into separate polygons where it is intersected by a border from the intersection layer. The attributes from each side of the border are added to the resulting polygon.

Area estimates for each FAA polygon were calculated in square degrees. This was done after any new polygons were created, such as during the intersect procedure. These area estimates were converted to square kilometres based on the latitude of the centroid. The centroid of each polygon was determined by taking the centre point of a polygon's bounding box (a box completely containing the polygon). If the centroid did not fall within the bounding box it was moved the shortest distance, left or right, to put it inside the polygon.

These attributes allowed selection of FAA data by IBRA, IGAER, state, minimum or maximum area, satellite receiving station, orbit number, satellite ID or time period.

4.4 Analysis of Fire Affected Areas in Relation to IGAER.

The area mapped as affected by fire within each IGAER over the two year study is shown in Figure 4.4. IGAER 1, 2, 3, and 11 show the greatest area burnt in both years. IGAER 9 (Temperate Highlands) and 10 (Temperate Slopes and Plains) showed a decrease in area burnt in the second year, whereas the remaining IGAERs showed an increase in area burnt.

Fire Affected Area For IGAER , 1998-1999 and 1999-2000

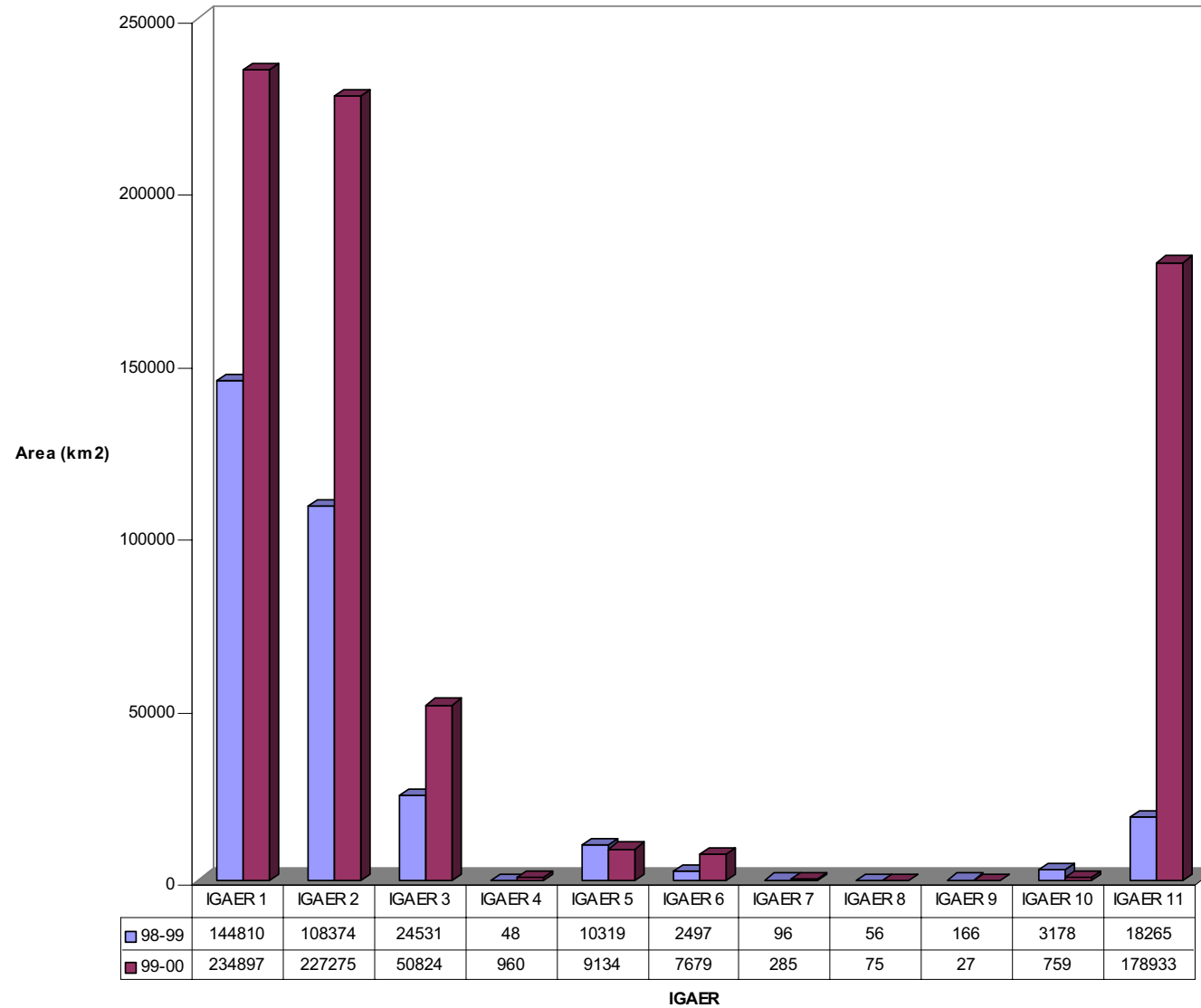


Figure 4.4 Area of IGAER affected by fire in the two year study. See Figure 1.2 for IGAER regions.

The first year of study (1998-1999) recorded an area of 312 340 km² as burnt. IGAER 1, 2, 3 and 11 made up 90% of the area burnt (Figure 4.5). The second year of study (1999-2000) recorded an area of 710 850 km² as burnt. IGAER 1, 2, 3 and 11 made up 98% of the burnt area (Figure 4.6).

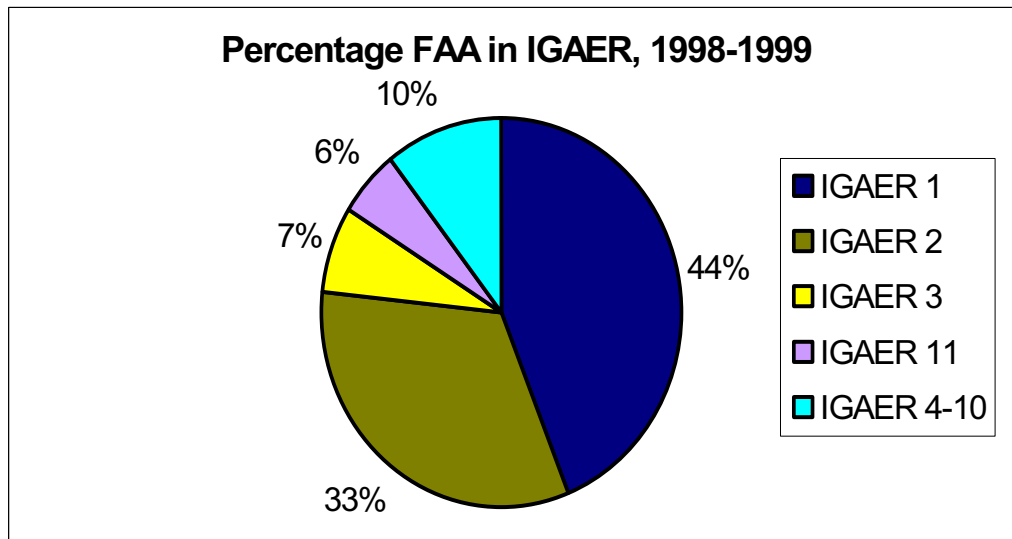


Figure 4.5 Percentage of FAA in IGAER, 1998-1999. See Figure 1.2 for IGAER regions.

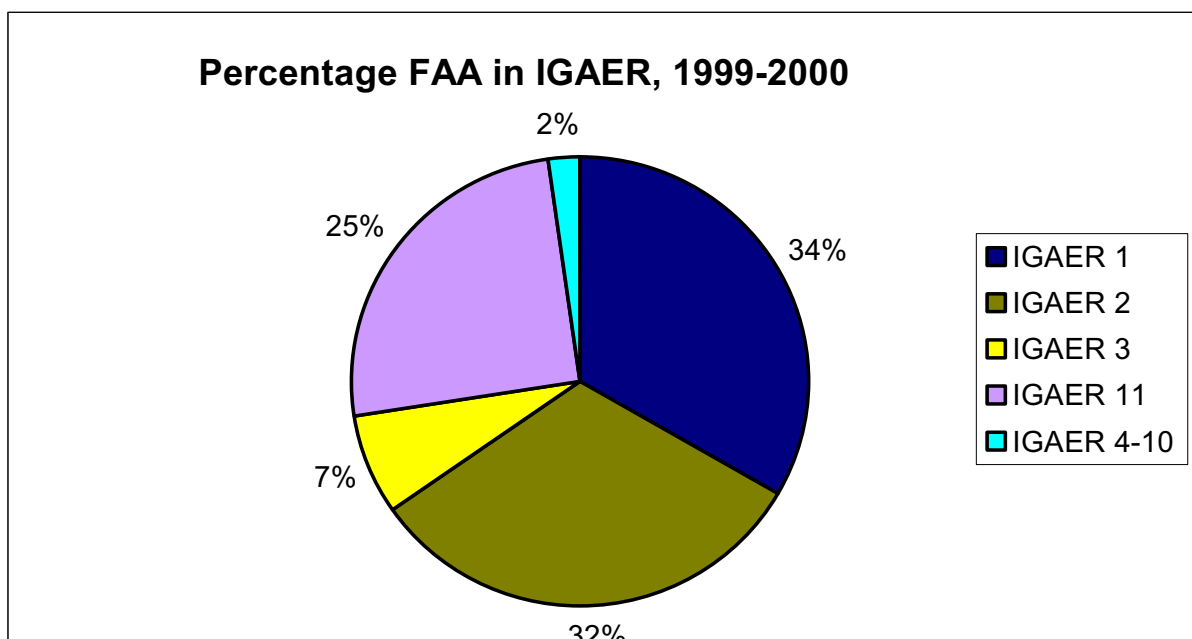


Figure 4.6 Percentage of FAA in IGAER, 1999-2000. See Figure 1.2 for IGAER regions.

Figures 4.7 showed the distribution of fire affected area for each individual IGAER. The second year of study showed an increase in fire affected areas in IGAER 1, 2, 3, 6, 7 and 11 whereas IGAER 8, 9 and 10 showed a decrease in fire affected areas.

During both years of study, the highest occurrence of mapped fire affected area occurred in IGAER 1, 2, 5, and 11 ($> 10\ 000\ \text{km}^2$) and the lowest ($< 1000\ \text{km}^2$) occurred in IGAER 4, 7, 8 and 9.

Figure 4.7 FAA area per month for each IGAER (IPR). See Figure 1.2 for IGAER (IPR) regions.

