**Supplement**

**S1. Contribution to coastal areas**

Contribution of adult moon jellyfish to different coastal areas from platform-based polyp populations is shown in Figure 5. Here we present the numerical values of particle densities for each of the coastal regions and all offshore sources. The numbers show average yearly densities (number of “adult” particles crossing each of the regions in a year divided by the surface area of the region) and their standard deviations. Map showing the locations of the regions is shown in Figure 4.

|      | P1a        | P1b        | P2         | P3         | P4         |
|------|------------|------------|------------|------------|------------|
| 1 ApuliaE | $2.0 \times 10^{-1} \pm 2.2 \times 10^{-2}$ | $1.9 \times 10^{-1} \pm 2.4 \times 10^{-2}$ | $1.8 \times 10^{-1} \pm 2.2 \times 10^{-2}$ | $1.1 \times 10^{-1} \pm 1.9 \times 10^{-2}$ | $1.2 \times 10^{-1} \pm 2.2 \times 10^{-2}$ |
| 2 ApuliaW | $1.7 \times 10^{-1} \pm 1.8 \times 10^{-2}$ | $1.6 \times 10^{-1} \pm 1.1 \times 10^{-2}$ | $1.0 \times 10^{-1} \pm 1.7 \times 10^{-2}$ | $5.2 \times 10^{-2} \pm 1.9 \times 10^{-2}$ | $6.2 \times 10^{-2} \pm 2.1 \times 10^{-2}$ |
| 3 Molise Abruzzo | $2.1 \times 10^{-1} \pm 2.7 \times 10^{-2}$ | $2.5 \times 10^{-1} \pm 1.9 \times 10^{-2}$ | $1.1 \times 10^{-1} \pm 2.0 \times 10^{-2}$ | $6.0 \times 10^{-2} \pm 2.5 \times 10^{-2}$ | $6.6 \times 10^{-2} \pm 2.6 \times 10^{-2}$ |
| 4 Marches | $1.6 \times 10^{-1} \pm 2.7 \times 10^{-2}$ | $1.9 \times 10^{-1} \pm 2.0 \times 10^{-2}$ | $6.2 \times 10^{-2} \pm 1.4 \times 10^{-2}$ | $2.5 \times 10^{-2} \pm 1.5 \times 10^{-2}$ | $2.5 \times 10^{-2} \pm 1.4 \times 10^{-2}$ |
| 5 EMR | $1.0 \times 10^{-1} \pm 2.0 \times 10^{-2}$ | $6.3 \times 10^{-2} \pm 1.2 \times 10^{-2}$ | $1.7 \times 10^{-2} \pm 5.9 \times 10^{-3}$ | $5.8 \times 10^{-3} \pm 4.6 \times 10^{-3}$ | $4.8 \times 10^{-3} \pm 4.4 \times 10^{-3}$ |
| 6 Veneto | $6.5 \times 10^{-2} \pm 1.3 \times 10^{-2}$ | $2.9 \times 10^{-2} \pm 4.3 \times 10^{-3}$ | $6.4 \times 10^{-3} \pm 2.6 \times 10^{-3}$ | $2.5 \times 10^{-3} \pm 1.8 \times 10^{-3}$ | $2.1 \times 10^{-3} \pm 1.6 \times 10^{-3}$ |
| 7 GoT | $4.6 \times 10^{-2} \pm 2.2 \times 10^{-2}$ | $3.5 \times 10^{-2} \pm 1.2 \times 10^{-2}$ | $7.2 \times 10^{-3} \pm 3.2 \times 10^{-3}$ | $4.2 \times 10^{-3} \pm 2.6 \times 10^{-3}$ | $2.5 \times 10^{-3} \pm 8.6 \times 10^{-4}$ |
| 8 Istra | $7.9 \times 10^{-2} \pm 4.4 \times 10^{-2}$ | $1.1 \times 10^{-1} \pm 5.2 \times 10^{-2}$ | $3.9 \times 10^{-2} \pm 1.0 \times 10^{-2}$ | $2.9 \times 10^{-2} \pm 8.5 \times 10^{-3}$ | $2.7 \times 10^{-2} \pm 7.8 \times 10^{-3}$ |
| 9 Kvarner | $2.6 \times 10^{-2} \pm 1.3 \times 10^{-2}$ | $4.3 \times 10^{-2} \pm 1.8 \times 10^{-2}$ | $2.4 \times 10^{-2} \pm 3.6 \times 10^{-3}$ | $2.3 \times 10^{-2} \pm 7.8 \times 10^{-3}$ | $2.2 \times 10^{-2} \pm 5.7 \times 10^{-3}$ |
| 10 Mid-CRO | $5.4 \times 10^{-2} \pm 2.3 \times 10^{-2}$ | $5.3 \times 10^{-2} \pm 1.9 \times 10^{-2}$ | $8.4 \times 10^{-2} \pm 3.1 \times 10^{-2}$ | $1.1 \times 10^{-2} \pm 3.8 \times 10^{-2}$ | $1.0 \times 10^{-2} \pm 3.1 \times 10^{-2}$ |
| 11 South-CRO | $2.8 \times 10^{-2} \pm 1.0 \times 10^{-2}$ | $2.8 \times 10^{-2} \pm 8.3 \times 10^{-3}$ | $4.1 \times 10^{-2} \pm 1.3 \times 10^{-2}$ | $4.8 \times 10^{-2} \pm 1.2 \times 10^{-2}$ | $4.8 \times 10^{-2} \pm 1.4 \times 10^{-2}$ |
| 12 Montenegro | $5.3 \times 10^{-2} \pm 3.3 \times 10^{-2}$ | $4.9 \times 10^{-2} \pm 2.5 \times 10^{-2}$ | $8.8 \times 10^{-2} \pm 3.5 \times 10^{-2}$ | $9.5 \times 10^{-2} \pm 1.9 \times 10^{-2}$ | $9.2 \times 10^{-2} \pm 2.6 \times 10^{-2}$ |
| 13 Albania | $3.5 \times 10^{-2} \pm 2.0 \times 10^{-2}$ | $3.2 \times 10^{-2} \pm 1.5 \times 10^{-2}$ | $5.8 \times 10^{-2} \pm 2.2 \times 10^{-2}$ | $5.4 \times 10^{-2} \pm 1.7 \times 10^{-2}$ | $5.7 \times 10^{-2} \pm 1.7 \times 10^{-2}$ |

**Table S1.** Yearly particle density [yr$^{-1}$ km$^{-2}$]: number of particles that cross each coastal region per year, divided by the surface area of the region. Rows list the target regions, columns list the sources (platform areas).

**S2. Recruitment matrix**

This is the direct output of recruitment for all 12 locations and recruitment areas. The first matrix lists average recruitment for the whole simulation period and the second
offshore marine constructions as propagators of moon jellyfish dispersal

matrix lists the standard deviation. Sources of particles are listed on the left in the first column and targets (recruitment locations) on the top of both tables. The standard deviations are relatively high indicating that there is considerable interannual variation. This again shows that in such experiments, realistic situations have to be used and that using ocean currents climatology is not enough.

S3. Comparison of model results with the observations

As mentioned in the introduction, the observations of jellyfish are scarce and lack a consistent methodology and studies as ours show the need for international standards and regular jellyfish monitoring. To get at least some evaluation of the model performance, we did a qualitative comparison with the results of Italian citizen science campaign. At this point it should be noted, that the variations of jellyfish presence are a consequence of interannual variations in strobilation, predation and other factors besides currents. Only the latter were accounted for in our model.

We chose to compare the results for the regions Gulf of Trieste (region of our own observations), and Veneto (see 3.1), since these two are mostly influenced by moon jellyfish originating from Koper and Trieste - the locations we are most acquainted. According to our results these regions are not heavily targeted by platform-originating jellyfish (Figure 5), so the number of possible sources is smaller. Boero et al. (2016) present a figure with a map of sightings of moon jellyfish for years 2009-2015 and while citizen science results are hard to evaluate since they are dependent of many factors such as interannual variations in awareness about the campaign, weather, time, and length of the tourist season, number of bathers, etc., we can at least qualitatively mark the years of more intensive and the years of less intensive moon jellyfish presence.

According to Boero et al. (2016) we can conclude that the year 2015 was a year of
Table S2. Number of adult particles crossing the region Gulf of Trieste (Figure 4) each year, listed for particles originating from the port of Koper and port of Trieste. The last column displays the number of sightings with more than 10 individuals per m$^2$ from the Italian citizen science campaign (Boero et al. 2016).

| Year | Koper | Trieste | No. of sightings |
|------|-------|---------|-----------------|
| 2011 | 159   | 120     | 3               |
| 2012 | 262   | 189     | 2               |
| 2013 | 107   | 46      | 1               |
| 2014 | 110   | 90      | 2               |
| 2015 | 254   | 169     | 5               |

Table S3. Number of adult particles crossing the region Veneto (Figure 4) each year, listed for particles originating from the port of Koper and port of Trieste. The last column displays the number of sightings with more than 10 individuals per m$^2$ from the Italian citizen science campaign (Boero et al. 2016).

| Year | Koper | Trieste | No. of sightings |
|------|-------|---------|-----------------|
| 2011 | 844   | 657     | 6               |
| 2012 | 1114  | 1029    | 4               |
| 2013 | 572   | 378     | 2               |
| 2014 | 720   | 582     | 1               |
| 2015 | 1052  | 797     | 5               |

intensive moon jellyfish presence in the Gulf of Trieste and that the year 2013 was a year of less intensive moon jellyfish presence in this region. Our unpublished data for the Slovene part of the Gulf of Trieste agree with this. As shown in Table S2, the model results agree relatively well with this claim. Similarly, we can mark the years 2011, 2012, and 2015 as years of intensive moon jellyfish presence, and years 2013 and 2014 as years of less intensive moon jellyfish presence for the region of Veneto (Table S3) and again the model results qualitatively support this. Though there are some doubts about the observation methodology and quantification of model output, these results give some
degree of confidence in model performance.